Final Report: Monitoring of Russia and Ukraine (priority 1) and Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan and Moldova (priority 2): Telecommunications and the Information Society

Commission contract no: 30-ce-0009814/00-41

Political Intelligence

London- Brussels- Madrid
39/3 Rue Montoyer B-1000 Brussels
T: (32) 02 503 2265 F: (32) 02 503 4295

Project Coordinator: Joe McNamee

In Co-operation With

INTERNEWS

Russia: Yuri Hohlov / Sergey Shaposhnik (IIS)
Armenia: David Sandukhchyan
Belarus: Mikhail Doroshevich
Kazakhstan: Andrew Beklemishev
Ukraine: Andriy Pazyuk
Azerbaijan: Yashar Hajiyev
Georgia: Volodymyr Hardabkhadze /Levan Kvernadze
Moldova: Ion Cosuleanu

December 2006
Revision 1

Structure

- **Introduction**
- **Priority 1**
  - **Russia**
  - **Ukraine**
- **Priority 2**
  - **Armenia**
  - **Azerbaijan**
  - **Belarus**
  - **Georgia**
  - **Kazakhstan**
  - **Moldova**

Political Intelligence

INTERNEWS

Introduction, Methodology and Context

Table of Contents

1 SUMMARY 4

2 METHODOLOGY 5

2.1 Exchange Rates....7

3 GENERAL ENVIRONMENT 8

3.1 Influence of non-public stakeholders on regulation and policy 8

3.2 National Development Plans....8

3.3 Data Protection 8

3.4 Cybercrime and Spam 9

4 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 10

4.1 Interconnection 10

4.2 Numbering 10

4.3 Rights of Way and Facilities Sharing/Collocation 10

4.4 Tariff Policy 11

4.5 Cost Accounting....11

4.6 Universal Service 11

4.7 Local Loop Unbundling 12

4.8 Leased Lines....12

4.9 Mobile Services....13

4.10 Satellite Services 13

4.11 Resources of National Regulatory Authorities (NRAs) 13

4.12 Licensing and Authorisation....14

4.13 Spectrum....14

5 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 15

5.1 Digital Signatures....15

5.2 Payment Systems 15

5.3 Taxation Issues....15

5.4 Conditional Access 16

6 USE OF ELECTRONIC COMMUNICATION SERVICES 17

6.1 Fixed line penetration....18

6.2 Mobile Sector 18

6.3 Fixed and mobile penetration....20

6.4 ICT Usage....20

6.5 Country-code top level Internet domains 21
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY.....23
7.1 Fixed Operators 23
7.2 Mobile Operators 25
8 ABBREVIATIONS.....30

1 SUMMARY

The study covers a geographically and politically diverse set of countries that share a common history as former members of the Soviet Union. The roll-out of information society services is made difficult by low income levels, which puts both equipment and services beyond the reach of many citizens. These difficulties are further exacerbated by weak fixed line infrastructure and low levels of access (particularly in rural areas) to fixed line networks.

Faced with these structural and economic factors, the 8 countries being studied (Russia, Ukraine, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan and Moldova) have endeavoured to undertake, and are continuing their efforts towards, varying degrees of privatisation and liberalisation. The ICT sector has been the focus of a significant degree of bilateral and multilateral cooperation (involving the EU, World Bank, UNDP, ITU, and NATO, for example), as it is seen as offering great potential for economic growth, underpinning democracy and creating wealth.

The study looks at the electronic communications and information society sector in the eight countries from three key angles:

1. The electronic communications sector (looking in particular at the regulatory framework supporting competition in the sector, as well as market development), and the legislative framework surrounding electronic service provision.
2. The services available, both commercial and governmental, which give an indication both of the development of the market and the extent to which citizens have compelling reasons to become “connected” to the information society.
3. The level of use of available services.

The eight countries have engaged in varying policies with regard to electronic communications and the information society, producing markets that, while similar, have fundamental differences. These differences include the level of competition in the telecommunications market, the degree of privatisation, and the extent to which online retail and service provision are supported by a comprehensive legislative framework. The study aims to give an overview of the development of telecommunications and the information society in the eight countries being studied.

The range of examples showing good and best practice is quite striking, indicating strong potential for these countries to cooperate effectively. There are good examples of best practice in each of the countries being studied: the practical and comprehensive planning of universal access to communications infrastructure in Russia; the new Ukrainian approach to data protection; the Armenian e-dram electronic money system; the simplification and low cost of the licensing regime in Azerbaijan; the efforts of Belarus to ensure universal access to fixed and mobile technologies; the independence and transparency of the Georgian National Regulatory Authority; the long-term approach of Kazakhstan’s Government to planning the development of the information society; and the comprehensive Moldovan adherence to international norms in the online environment. With sufficient communication between the countries to share such best practice and with assistance from international organisations such as the European Union, significant progress can be made towards realising these countries’ information societies.

2 METHODOLOGY

The present study covers a geographically and politically diverse set of countries that share a common history as former members of the Soviet Union. Partly due to this historical backdrop, the eight countries examined all have significant communications infrastructure problems, particularly with regard to access to fixed networks, which are especially noticeable in rural areas. The roll-out of information society services is made still more difficult by low income levels which militate against the rapid deployment of services. From this starting point, the eight countries being studied – Russia and Ukraine, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan and Moldova – have endeavoured to undertake varying degrees of privatisation and liberalisation and have been supported in these initiatives by various international organisations such as the World Bank, the International Telecommunication Union and the European Union. The ICT sector has been the focus of significant international cooperation, as it is seen as offering great potential for economic growth and wealth creation.

The report looks at the development of the ICT sector in order to analyse the progress made in maximising the potential benefits of the information society. Two key aspects are considered in order to achieve this overview:

- The use of electronic services and the monitoring of this usage in order to gain a view of levels of participation in the information society by Government, business and citizens, and of the level of dynamism in the ICT and telecommunications market.
- The creation and implementation of a suitable legal framework to strengthen competition, transparency and interoperability.

(1) The use of electronic services and the monitoring of this usage in order to gain a view of levels of participation in the information society by Government, business and citizens, and of the level of dynamism in the ICT and telecommunications market.

The study looks at the available statistics in each of the countries, drawing comparisons with EU data, as applicable. However, there is a recognised[1] problem with regard to the methodologies used in the development of ICT statistical indicators, particularly in less developed countries. It is widely noted that methodological inconsistency and the absence of statistics "seriously hamper[s] policy efforts and blindfolds decision makers"[2]. Therefore, while every effort has been made to collate accurate, comparable and timely data, this context should be noted. An additional problem with regard to reliable data is the varying extents to which the "black economy" influences the level of usage of information society services but does not appear on official statistics.

The statistical overview at the beginning of the report provides a greater amount of data for the more easily verifiable mobile market than provided on the fixed network market, with the mobile market generally representing the most competitive and cost oriented

[1] Joint UNECE/UNCTAD/UIS/ITU/OECD/Eurostat Statistical Workshop on Monitoring the Information Society: Data Measurement and Methods, Report, 16 January 2004

[2] Ibid P.9

aspect of the communications market. With a weaker statistical basis, older available statistics, and a significant degree of ongoing change due to tariff rebalancing, fixed communications data are less reliable and provide fewer insights into the potential of the markets being studied.

(2) The creation and implementation of a suitable legal framework to strengthen competition, transparency and interoperability.

Developed economies, particularly in the EU and US, have created extensive regulatory frameworks in order to promote the development of the information society. The experience of these economies gives a clear view of what policies are necessary and falls broadly into two categories:

(a) **Telecommunications competition:** The creation of a competitive and innovative market for fixed, mobile and Internet access services serves to reduce costs whilst increasing choice for customers.

(b) **E-commerce:** Issues such as electronic signatures, content liability, copyright and related rights, and distance selling need to be addressed to allow consumers take advantage of the information society.

The study considers the development of the communications and e-commerce regulatory framework (both in terms of competition and content issues) in the eight countries, drawing comparisons with the EU regulatory framework, where appropriate.

(3) Availability of Services

For use of the information society to grow, there must be services on offer that make citizens want to connect to new communications methods. One obvious example lies in the mobile environment: the lack of “waiting time” in order to be connected to a mobile service, compared with sometimes long delays in the installation of fixed lines, has meant that citizens have a clear and compelling reason to adopt this technology. Similarly, good e-government services can help encourage citizens to access new communications technologies. The study seeks to highlight the services on offer to citizens and the extent to which these are developing and are sufficient to meet customer needs and expectations.

By providing an overview of the current state of development of the information society, the extent to which the regulatory framework is in place to allow e-commerce and access services to develop in a competitive and innovative way, and through a general overview of the services currently on offer, an understanding can be developed of the strengths, weaknesses and current development of all of the countries in the study.

Comparisons as to the level of “informatisation” of these eight countries can then be drawn, forming the basis for benchmarks of ICT in the region.

In the study, a figure of 420 Euro is taken as an estimate, from our local experts, of the cost of a standard new computer in their respective countries. This figure is purely indicative in order to draw a comparison between wage levels and the rough cost of a

computer. The only exception is Azerbaijan, where the local expert advised that local production meant that cheaper computers were available.

2.1 Exchange Rates

All currency conversions used in this report use the following exchange rates:

Exchange Rates

Currency	AMD	AZN	BYR	GEL	KZT	MDL	RUB	UAH	USD
1 Euro	*550.505*	*1.11875*	*2604.81*	*2.17095*	*161.878*	*15.5315*	*34.4154*	*6.16265*	*1.21*

3 GENERAL ENVIRONMENT

3.1 Influence of non-public stakeholders on regulation and policy

Trade associations and civil society groups have played an important role in the EU, both as consultation partners in the development of legislation and as partners for the elaboration and management of self- and co-regulatory approaches to dealing with issues of concern, such as harmful or illegal content on the Internet. The existence of such groups and their inclusion in the decision-making process is therefore important for the development of effective and proportionate legislation.

The eight countries considered in the study represent the full range of experience in terms of the influence of non-public stakeholders, from those countries with little or no industry and civil society input at one extreme, to those, such as Georgia, with sophisticated and legally binding requirements for consultation on the other.

3.2 National Development Plans

The EU has run a series of development plans for the consistent development of the online environment in Europe. The aim of these initiatives (namely the eEurope 2002 Action Plan, eEurope 2005 Action Plan, and the i2010 initiative) is to help encourage the development of a competitive, knowledge-based economy which, in turn, supports economic growth, more job creation and greater social cohesion. A key focus of the Action Plans has been to “benchmark” key statistical indicators in order to better target policy initiatives. The EU’s ICT development plans have included provisions relating to e-inclusion and citizenship, e-government, interoperability, trust and dependability, and the use of ICT by business. The earlier EU programmes focused on fostering the rollout of and access to online communications and services; whereas later plans placed more emphasis on “supply-side” issues (such as the stimulation of Internet content provision to encourage online activity).

In the eight countries studied, there is a widespread - but not universal - problem with the responsible ministries and departments sustaining the long-term effort necessary to ensure the implementation of national development plans. On the other hand, a minority of the countries, Kazakhstan in particular, has invested a high level of management expertise to ensure long term commitment to the national plan.

3.3 Data Protection

The basic principles behind both the general (1995/46/EC) and electronic communications specific (2002/58/EC) EU data protection directives require that data

only be used for the purpose for which it was collected, that consumer authorisation be obtained for further processing, and that data not be transferred internationally without safeguards to ensure the same level of data protection would be afforded as under EU legislation.

Generally, data protection is not given a particularly high priority in the eight countries studied. Most countries use constitutional privacy safeguards, without specific enforcement mechanisms, for privacy protection. Ukraine is the only country which currently looks likely to create a national, independent data protection authority. Moldova is in the process of approving its new law on data protection.

3.4 Cybercrime and Spam

Details of the legislation that forms the background to national rules concerning online child pornography in each of the countries in this study can be found at http://www.interpol.int/Public/Children/SexualAbuse/NationalLaws/csa**xx**.asp, where **xx** being replaced by the ISO code of the country in question (ru, ua, am, az, by, ge, kz and md).

A full list of the Intellectual Property Rights (IPR) legislation in each country in the study can be found at: http://www.wipo.org/about-ip/en/ipworldwide/pdf/**xx**.pdf, where **xx** is replaced by the name of the country concerned.

All of the countries in the study have had problems with implementation of intellectual property rights legislation, and broadly similar efforts are being undertaken across the region to address these. With regard to online child abuse images, work still needs to be done to ensure industry and government engage to address this problem effectively, particularly by the larger countries in the study.

Armenia, Moldova and Ukraine have signed the Cybercrime Convention (ETS 185) of the Council of Europe, although it has so far only been ratified and entered into force in Ukraine and Armenia.

Ukraine is the only country to have enacted comprehensive rules limiting the sending of unsolicited commercial communications.

4 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS

4.1 Interconnection

In the EU, interconnection is governed primarily by the Directive on access to, and interconnection of, electronic communications networks (Directive 2002/19/EC). This sets out the rights and obligations of network providers with regard to interconnection and the powers of NRAs, including their right to intervene when commercial agreement has not been possible between operators. Network operators are obliged to negotiate interconnection when requested by an authorised operator to do so. More stringent obligations are placed on operators designated as having significant market power (SMP).

There has been a remarkable amount of progress in most of the countries in the study towards implementing effective interconnection regimes since the beginning of 2005, including a major overhaul of the legislative framework in Russia and a significant increase in implementation of available legal instruments in Armenia. However, the legislative and implementation frameworks are still being developed in some countries.

4.2 Numbering

In the European Union, the Framework Directive (2002/21/EC) requires competitively neutral management of numbering resources and that the national numbering plan is under the management of the national regulatory authority.

Despite the wide range of approaches taken in the eight countries, few problems have been identified in numbering policy. There appears to be little policy preparation for issues such as VoIP numbering in any of the countries in this project.

4.3 Rights of Way and Facilities Sharing/Collocation

In the EU, the Framework Directive (2002/21/EC) establishes that permission to build networks must be provided in a competitively neutral way and, where a local authority owns a network, there must be structural separation of the function of providing rights to build networks and the activities associated with ownership or control. Facilities sharing is encouraged and can be required in particular circumstances.

There are few rules in the eight countries which clearly define the rights and responsibilities of operators with regard to sharing facilities. No major problems have been reported with regard to rights of way.

4.4 Tariff Policy

As part of the liberalisation process, tariffs need to be rebalanced, with subsidised local calls/access charges being brought into line with costs and high-priced international call charges reduced. In the EU, national regulatory authorities can intervene to ensure cost orientation of prices using powers created under the Access Directive (2002/19/EC) and before that by the Interconnection Directive (1997/33/EC).

Almost all the countries under study have identified tariff rebalancing as an unavoidable step to ensuring the creation of a fully liberalised market for voice telephony, although several of the countries are quite far from achieving full rebalancing.

4.5 Cost Accounting

Long-run average incremental cost (LRAIC) is the approach taken in the EU for the calculation of traffic costs, as described, inter alia, by the Commission Recommendation on Interconnection in a liberalised telecommunications market (97/3148).

Limited fixed line competition means that the development of cost accounting in most countries in the study has not been carried out to a significant extent, although this is changing in some of the countries, such as Moldova.

4.6 Universal Service

Universal service policy in the EU is regulated primarily by Directive 2002/22/EC. The primary purpose of universal service policy is to ensure that, in a competitive environment, a basic set of services is available to all citizens, i.e. including vulnerable sections of society, such as the elderly and disabled, and those living in remote geographic locations.

There has been a move recently to deal with universal service in a pragmatic and target-oriented way in most of the countries, particularly Russia, Ukraine, Azerbaijan, Belarus and Kazakhstan. Several administrations have set targets for ensuring that citizens in smaller settlements have, as a minimum, communal access to communications infrastructure. This approach is aimed at dealing with the practical problems created by the severe urban/rural “digital divide” experience across all eight countries.

4.7 Local Loop Unbundling

Full unbundling, shared access and the unbundling of sub-loops became obligatory in the EU through Regulation 2000/2887/EC, although some countries had implemented unbundling obligations prior to its entry into force.

Experience of local loop unbundling (LLU) varies across the countries studied, ranging from situations where there is no legal nor informal opportunity for unbundling, to comprehensive legal frameworks which are proving difficult to implement in practice. Interestingly, in Armenia and Belarus, there is no legal LLU framework in place, but informal arrangements exist between ISPs and the incumbent for the unbundling of lines for Internet access purposes.

4.8 Leased Lines

Council Directive 92/44/EEC, amended by Commission Decision 98/80/EC, establishes obligations in the EU with regard to, inter alia, information concerning technical and supply conditions, contract conditions, usage conditions and the provision of a minimum set of leased lines. The table below shows the European Commission's recommended[3] price ceilings for leased lines in the EU.

European Commission's recommended[4] price ceilings for leased lines in the EU

Capacity	Ceiling for the sum of the monthly price and 1/24 of the one-off connection price for a circuit length of up to 2km (euro)	Ceiling for the sum of the monthly price and 1/24 of the one-off connection price for a circuit length of up to 5km (euro)	Ceiling for the sum of the monthly price and 1/24 of the one-off connection price for a circuit length of up to 15km (euro)	Ceiling for the sum of the monthly price and 1/24 of the one-off connection price for a circuit length of up to 50km (euro)	Ceiling for the One-off connection price
64 kbit/s	61	78	82	99	542
2 Mbit/s	186	248	333	539	1112
34 Mbit/s	892	963	1597	2539	2831
155 Mbit/s	1206	1332	1991	4144	3144

Analysis of the leased lines market is made more difficult in most of the eight countries due to no distinction having been made by statistics agencies between ADSL lines and traditional leased lines. There is generally no obligation for leased lines to be available

[3] Commission Recommendation of 29 March 2005 on provision of leased lines in the European Union

[4] Commission Recommendation of 29 March 2005 on provision of leased lines in the European Union

at all points in the territory, with competitive problems being raised by ISPs and mobile operators in several countries. In Russia and Ukraine, mobile operators are reportedly looking to other technologies (such as satellite) in order to avoid relying on leased lines provided by the incumbents. Satellite connections are also used by NRENs.

4.9 Mobile Services

Mobile services are a crucially important part of the communications landscape. In the EU, the market for mobile telephony services grew from an already well developed base of 88 billion Euro in 2001 to 122 billion Euro in 2004, while fixed services remained generally static. With the growth of third generation services and mobile content services (such as downloadable services from 3G and GPRS), the expected integration of instant messaging services in 3G products, and the development of m-payments, there is considerable potential for ongoing growth. The European experience gives an insight into the economic and social significance of the mobile sector for the countries being studied. The EU's efforts in standardisation using GSM and the benefits that this has created are also worthy of note.

The mobile market is growing at a very high rate across the eight countries, particularly in the larger ones. The growth and availability of mobile services is partially addressing the widespread problems regarding lack of access to telephony in rural areas. Interestingly, both Russia and Ukraine are seeing MVNOs entering the market for the first time.

4.10 Satellite Services

Satellite services are valuable for providing communications services in remote or difficult to reach locations. They are also used extensively to connect to major international networks, including in the GEANT network in Europe and neighbouring countries.

Satellite is used in some remote regions in the countries being studied to provide access to communications infrastructure and is widely used by ISPs in some of the smaller countries, such as Armenia, as an alternative to using backbone services provided by the incumbent. Satellite is also being used in the "Silk Road Project" for the Southern Caucasus and Kazakhstan to support Internet access for national research networks.

4.11 Resources of National Regulatory Authorities (NRAs)

EU Member States are required by Article 3 of the Framework Directive (2002/21/EC) to have an independent National Regulatory Authority that is impartial and transparent and

that works in cooperation, as necessary, with the National Competition Authority of the country.[5]

There has been a surprising amount of progress in terms of ensuring and improving the resources of NRAs in the 18 months since January 2005, when this project first began. Four countries (Ukraine, Armenia, Georgia and Moldova) now have independent NRAs, while plans are underway for one to be set up in Kazakhstan and Azerbaijan. There appears to be little immediate prospect of independent NRAs being set up in Russia and Belarus.

4.12 Licensing and Authorisation

The EU Authorisation Directive (2002/20/EC) establishes the principle that only general authorisations are required for most kinds of communications services, unless the use of scarce resources is required.

There is a wide range of experience in the eight countries. Generally, there have been some significant improvements over the past few years: licence fees have been reduced, procedures simplified and redundant licences removed. Russia and Azerbaijan are two positive examples in this regard.

4.13 Spectrum

Spectrum management is governed in the EU by Decision 676/2002/EC. The Decision aims to create harmonised and more efficient use of spectrum. It also improves information provision regarding the use and availability of spectrum as well as spectrum plans.

In the eight countries, the situation regarding spectrum management is in a state of flux, with rapid progress being seen in several administrations, particularly Ukraine. In some countries, the NRA is responsible for spectrum management, in others it is the sole responsibility of one ministry. In Azerbaijan, spectrum is managed simultaneously by several state committees in a range of ministries. The biggest development has been in Ukraine, where a major overhaul of spectrum has recently been undertaken, freeing up a great deal of resources.

[5] The responsibilities of NRAs with regard to spectrum allocation are dealt with separately below in the section on spectrum.

5 REGULATORY ENVIRONMENT FOR ONLINE SERVICES

5.1 Digital Signatures

The EU Electronic Signatures Directive (1999/93/EC) prohibits Member States from requiring prior authorisation for e-signature services and establishes rules concerning the legal effect of electronic signatures and qualified certificates as well as the liability of certification service providers. It is, moreover, not technology specific.

In the countries covered by this study, legislation is either comparatively new and untested, or has not yet been passed. Consequently, issues such as the liability of certification service providers have not been extensively developed in any of the countries being studied. A major overhaul of Russian legislation is underway, which appears to address the full range of problems experienced with the existing legislation.

5.2 Payment Systems

Payment systems in the EU are governed by general legislation concerning credit institutions, as well as legislation covering cross-border payments (Regulation 2001/2560/EC) and electronic payment systems (Commission Recommendation 97/489/EC).

There is little legislation in the eight countries in the study in the area of payment systems, the notable exception being Armenia, which has introduced a licensing system following the significant success of prepaid cards for electronic payments there.

5.3 Taxation Issues

In order to ensure a level paying field among suppliers providing electronically-delivered services to European consumers, the EU introduced the Directive on “value added tax arrangements applicable to radio and television broadcasting services and certain electronically supplied services” (2002/38/EC).[6]

None of the countries in this study have published legislation regarding the taxation of electronically delivered services.

However, there have been general problems in Ukraine regarding the administration of taxes and levies in the communications sector. For example, in the period January 2005

[6] Official Journal L 128 of 15.05.2002

to March 2005, the Ukrainian government implemented legislation stating that VAT could not be recovered on goods sold below cost (which impacted on some mobile handset sales). While this issue has been resolved, another problem has arisen regarding a levy of 7.5% of levied charges that mobile operators have to pay to the Ukrainian pension funds. This issue has not yet been resolved. In addition, the government refused an industry request in 2005 to abolish VAT obligations on the levy.

5.4 Conditional Access

The protection of conditional access services is provided for in the EU by Directive 98/84/EC "on the legal protection of services based on, or consisting of, conditional access". The aim of the Directive is to ensure that the security of conditional access services is not breached.

Of the eight countries in this study, only Russia (2002) and Moldova (2003) have signed the Council of Europe Convention on the Legal Protection of Services based on, or consisting of, Conditional Access (CETS 178). Russia has not yet ratified it. This Convention requires parties to legally prohibit the possession, distribution, importation, installation, manufacture or promotion of equipment or devices used circumvention of security measures used to protect conditional access services. The purpose of the Convention is to "*help European providers of audiovisual and online services to reduce financial losses sustained as a result of electronic and computer piracy, in the interests of both service operators and the public*."[7]

[7] Council of Europe, "Moldova ratifies and signs a series of Council of Europe Conventions", 21 June, 2001

6 USE OF ELECTRONIC COMMUNICATION SERVICES

For comparison, the below table highlights the key European usage indicators.

European eCommunications services usage indicators

Communications Used	% Penetration/Use
Fixed Telephony penetration	82% (10th Implementation Report)
Mobile Telephony penetration	49% (10th Implementation Report)
Household PC penetration	58% (Eurostat 2005)
Household Internet penetration rate	49% (Eurostat 2005)
Individuals accessing the Internet at least once per week	44% (Eurostat 2005)
Household connections to the Internet via broadband	23% (2005), via modem (24%)(2004) (Eurostat)

The provision of online services has been growing steadily in the EU over the past decade, with consumers and business increasingly relying on the Internet to carry out transactions. Data from Eurostat highlights that 12% of EU businesses received orders online in the last calendar year (2005), 19% of customers placed online orders, and 62% of companies now have a website.

Growth in Internet use is driven by the services and content on offer. In recognition of this, the European Commission has focused on the "supply side" aspects of the digital revolution and has sought to lead online take-up by example through the provision of e-government services. The aim of e-government is not only to provide information about Government activities and staff, for example, but to facilitate communication and interaction between citizens and government, and to simplify administrative procedures (such as planning applications etc). Eurostat figures from 2004 illustrate that 51% of companies used e-government services, compared with 45% of individuals.[8]

E-health is another area with potential for further development. In 2004, 2.5% of EU consumers used online resources to seek advice for health-related issues, while 17.2% used the Internet to search for health-related information.

The use of the Internet as a formal educational tool is also growing in the EU: in 2004, 10.4% of consumers (measured over a three-month period) used the Internet for formalised educational activities, while 20% of businesses used e-learning resources for the training and education of employees.

One significant difference between the countries in the study and the EU is the number of Internet exchanges (IXP). An IXP is a facility where ISPs can exchange traffic. Each ISP is normally responsible for obtaining their own connection, leased or otherwise, to the exchange point. Local or regional IXPs mean that ISPs can more easily peer and that local traffic stays local. Aggregation of international traffic also allows cost savings. There are more IXPs in individual large countries in the EU than the combined total of the eight countries in the study. This is of particular concern in the Southern Caucasus,

[8] All data from Eurostat http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-NP-05-035/EN/KS-NP-05-035-EN.PDF

where there is no regional exchange, meaning the potential for a wider range of cost effective services is limited.

6.1 Fixed line penetration

	RU	UA	AM	AZ	BY	GE	KZ	MD	EU
No. of Telcos	*	1	1	1 national 4 regional	1	6	369**	7***	82 major
Penetra-tion	30.4%[9]	24.3%[10]	20%[11]	13.79% [12]	35%[13]	12.7% [14]	17.9%[15]	28%[16]	49%[17]

**There are several large groups (Golden Telecom, Antel Holdings, etc) meaning that the absolute number of fixed operators does not give an accurate view of the number of businesses in the market.*

** Over 1000 local licences issued

****Based on the number of PSTN interconnection agreements signed by Moldtelecom.*

6.2 Mobile Sector

It is worth mentioning the methodology used in the eight countries to calculate mobile penetration rates. The fact that the vast majority of mobile subscribers are pre-paid users distorts the statistics in the eight countries being studied. The reason for this is two-fold. Firstly, the statistics often include both active and inactive users (i.e. customers who own SIM cards but have not used them in the previous few months). The definition of active/inactive user also differs across the countries (see below). Secondly, high churn rates, which are common in developing markets, also affect the accuracy of the figures, as these are often not factored into the statistics. MTS reported annual churn rates of 26.8% in Russia and 20.4% in Ukraine in the first quarter of 2005.[18] This adjustment has ***not*** been made in the table on penetration rates on the following page.

[9] End of the 2Q 2006. http://www.inforegion.ru/ru/main/infrastructure/activities/

[10] Based on population and fixed telephone line data from Ukrstat, both dated October 2006.

[11] Data from the State Commission on the Protection of Economic Competition

[12] State Statistical Committee, Azerbaijan in Figures, 2006
http://www.azstat.org/publications/azfigures/2006/en/016.shtml.

[13] Based on a presentation made by the Belarusian Communications Minister in April 2006..

[14] Calculated using subscriber figures from the GNCC and population data from Statistics Georgia.

[15] "Transport and Communications in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[16] ANRTI data from September 2006

[17] EuroStat, "Statistics in Focus Industry, Trade and Services", 2006.

[18] From a presentation given in New York in June 2005 by the President and CEO of MTS, Vassily Sidorov.

Where statistics are inaccurate, this can have negative implications on the development of public policy. Based on the table below, there appears to be a significant risk of major inaccuracies in some of the countries in the study, particularly in Russia whose figures are distorted both by the long period during which inactive cards are counted in statistics and (although no empirical evidence is available for this) and a possibly significant number of people who hold multiple SIM cards in order to take advantage of different pricing structures and/or because they travel frequently in different regions.

Time necessary before inactive SIM cards are deactivated

Country	Duration of inactivity of a prepaid SIM card before deactivation
Russia	6 months except Megafon (3 months)
Ukraine	3 months for UMC customers and 6 months for Kyivstar customers
Armenia	1 month for Armentel Customers and 6 months for Vivacell customers
Azerbaijan	2 months
Belarus	No prepaid services – all subscribers must be registered & provide ID.
Georgia	1 year
Kazakhstan	3 months
Moldova	3 months

Mobile penetration rates

	No. of providers	Penetration (no. of active SIM cards as % of population)	Penetration (as a percentage of fixed penetration)
Russia	200[19]	98.8%[20]	325%
Ukraine	5 (2 major)	84.9% [21]	335%
Armenia	2	21.9%[22]	109%
Azerbaijan	4 (2 major)	26.9%[23]	195%
Belarus	4	56.5%[24]%	161%
Georgia	5	27.2%[25]	204%
Kazakhstan	4	39.9%%[26]	223%
Moldova	2 (3rd GSM licence recently issued to incumbent fixed operator)	32.5%[27]	116%

[19] Figures based on the number of mobile licences issued.

[20] End of the 2Q 2006 http://www.inforegion.ru/ru/main/infrastructure/activities/ .

[21] http://www.cellular-news.com/story/19810.php

[22] This data was received from sources at the two mobile operators and date from late 2005

[23] State Statistical Committee, Azerbaijan in Figures 2006
http://www.azstat.org/publications/azfigures/2006/en/016.shtml.

[24] Data from Onliner (online technology publication) 1 November 2006. See http://onliner.by/cont/onl_market06_10.pdf

[25] Data from the GNCC and Statistics Georgia

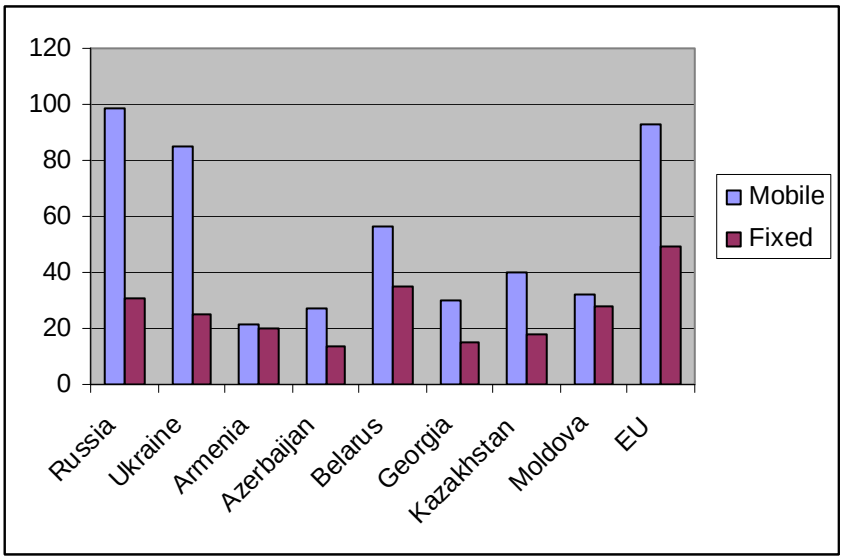
[26] Based on Agency on Statistics of the Republic of Kazakhstan, 1st half of 2006 report, July 2006

[27] Information from the National Regulatory Authority (ANRTI) dated September 2006.

EU	80 networks / 166 providers[28]	92.8%[29]	187%

6.3 Fixed and mobile penetration

Comparison between fixed and mobile penetration in all eight countries plus the EU.



6.4 ICT Usage

Household ICT penetration

	PC cost (% of GNI[30])	PC penetration	Internet penetration
Russia	9.4%	12.1%[31] %	21%[32]
Ukraine	27.6%	N/A	11.4 %[33]
Armenia	28.6%	N/A	7.5%[34]

[28] From the European Commission's Tenth Implementation Report.

[29] From the European Commission's Eleventh Implementation Report.

[30] All figures (except EU) from World Bank and using 420 Euro (except AZ where a 330 Euro is used due to cheaper locally-assembled PCs) as an estimate of the cost of a PC.

[31] End of 2005. http://www.inforegion.ru/ru/main/infrastructure/activities/.

[32] Public Opinion Foundation, Russia. Figure reflects users that connected to the Internet once in the previous 3 months (Summer 2006).

[33] Calculation based on September 2006 official state statistics and population estimate.

http://www.internetworldstats.com/stats4.htm

Azerbaijan	33.9%	7% [35]	8%[36]
Belarus	15.2%	7.52%[37]	34.8%[38]
Georgia	31%	N/A	3.9%[39]
Kazakhstan	12.51%[40]	5.1%[41]	4%[42]
Moldova	47%	6.8%[43]	17.4%[44]
EU	2%[45]%	31%[46]	47%[47]

6.5 Country-code top level Internet domains[48]

Country	Global Ranking (gTLDs)*	Total number of gTLDs**	Registrations in ccTLD***
Russia	21	194,481	519,615
Ukraine	45	42,013	177,671[49]
Armenia	141	903	4,500[50]
Azerbaijan	113	2,249	4,200[51]
Belarus	91	5,031	3,500
Georgia	125	1,242	N/A
Kazakhstan[52]	129[53]	1,276[54]	13,000[55]

[34] Figure based on data available from Internetworldstats.com, dated September 2005. Local informal estimates put this figure a little lower, at 5%-6%.

[35] 'Communication of Azerbaijan' Statistical Yearbook (for 2005)

[36] Official report of Ministry of Communication and Information Technologies made at the International ICN exhibition Bakutel-2006

[37] The most recent PC penetration statistics available are from 2003, from the World Bank.

[38] Official data from 2005.

[39] ITU 2005 quoted in Internetworldstats.

[40] Based on a 500US$ (420 Euro) computer and 3,996 US$ (3,320) average annual wage (as of July 2006), data provided by the Agency on Statistics of the Republic of Kazakhstan

[41] "Science and Innovation Activity in Kazakhstan in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[42] Idem

[43] Digital Assessment Index, eReadiness Report 2004.

[44] Idem.

[45] EU per capita figures used are from a presentation made by Klaus Gretschmann at the Knowledge Economy Forum in 2006.

[46] EuroStat 2005

[47] EuroStat 2004.

[48] All data from http://www.webhosting.info, except .EU data, which comes from a Eurid press release issued on 13 April 2006. Available from http://www.eurid.eu/en/general/news/1-5-million-eu-registrations-in-less-than-a-week - last visited 9 May 2006.

[49] From http://www.hostmaster.net.ua/UAstat/2006/jan2006.html (last visited 15 May, 2006)

[50] As of September 2004

[51] From the interview of ccTLD az administrator Faig Farmanov.

[52] Article 19, in a report Commissioned by the OSCE has criticised domain name policy in Kazakhstan as being excessively restrictive, particularly with regard to the requirement that name servers be physically located in Kazakhstan, which it considers to be a breach of Kazakhstan's obligation, as a signatory of the International Covenant on Civil and

Moldova	96	4,391	8,225+[56]
EU	2	Over 11,000,000	2,000,000

* Global ranking based of numbers of domain names registered under the main open generic TLDs (gTLDs) such as .com, .net and .org and as reported by webhosting.info

** Actual total number of domain names registered under such gTLDs and as again reported by webhosting.info

*** Number of second level domains registered in the national country code (or .EU in the case of the EU) TLD registry, whether in the second or third level.

**** The vast majority of these are registered as third level domains under such second levels as .com.ua, .kiev.ua and .dp.ua. It was not possible to register second level domains under .UA until 2001.

Political Rights, not to implement policies in contradiction of the spirit of that treaty. The report, which provides details of the rules in question can be accessed here: http://www.article19.org/pdfs/analysis/kazakhstan-s-domain-names.pdf (last visited 17 August, 2006)

[53] Data from http://www.webhosting.info accessed on 13 November, 2006

[54] Data from http://www.webhosting.info accessed on 13 November, 2006

[55] According to Nurlan Isin, President of Kazakhstan's Association of IT Companies, accessed at http://www.itk.kz/index.php?option=content&task=view&id=363

[56] According to the fact sheet from Max.md, registrar for the MD ccTLD.

7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY

This section of the study aims to give a brief overview of the ownership structure in the communications sector in each of the countries being examined. This should provide an insight into the level of competitiveness and attractiveness to foreign investors of companies in each country, as well as the degree of state involvement.

With regard to state ownership in the EU, in August 2004, six countries had no shares in the former incumbent fixed line operator, three owned between zero and ten per cent of the former incumbent, nine owned between 10 percent and 49 percent, five owned between 50 percent and 75 percent, and two were 100 percent state owned.[57]

7.1 Fixed Operators

Name of Operator Privatisation status	State Ownership Ownership Share	Name of Partner Ownership share	Investors - Name (if known) Ownership Share	Public
Russia				
Svyazinvest Privatisation date unclear	Ministry of State Property / Russian Federal Property Fund 50%+1 share / 25%+1 share	None	Mustcom Ltd 25%–2 shares	None
Rostelecom Privatisation of state shares - see Svyazinvest	Svyazinvest 50.67%	None	Employees and other individuals 7.03%	Foreign investors represented by nominee shareholders 38%

[57] Annex to the 10th European Electronic Communications Regulations and Markets 2004 (10th Report)

Ukraine

Ukrtelekom	Ministry of Transport & Communications	None	None	7.32% owned by employees
Privatisation date not fixed	92.68%			

Armenia

Armentel Privatisation of remaining state shares possibly in conjunction with OTE's 90% share to Vimpelcom	Office of the Prime Minister (via Collegiate management body)	OTE (GR) (sold to Vimpelcom but contract not signed at time of writing in November 2006)	None	None
	10%	90%	None	None

Azerbaijan

Aztelekom Privatisation not imminent	100%	None	None	None
Baktelecom Privatisation not imminent	100%	None	None	None

Belarus

Beltelecom	Ministry of Communications	None	None	None
Privatisation not imminent	100%			

Georgia

Georgia Telecom	0%	Metromedia (USA) 81%, Bulcom (Cyprus), 19%	None	None
UTG	Ministry of Economic Development	None	90.3% Turan Alem Bank (KZ)	9.7%
Privatisation of 90.3% completed 2006				

Kazakhstan

Kazakhtelecom	Joint Stock Company Kazakhstan's Holding for State Assets Management "Samruk"		Bodam B.V. (Netherlands) 16.9% Bank of New York (USA) 10.2% Central Asian Industrial Holdings N.V. (Antiles) 9.6% Others 7.7%[58]	The company is publicly listed. There are plans to offer 4.6% of government shares for sale to citizens of Kazakhstan.
Privatisation of remaining shares not imminent	54%			

Moldova

Moldtelecom	Ministry of Information Development	None	None	None
3 failed attempts at privatisation. Further privatisation attempts not planned in the short term	100%			

7.2 Mobile Operators

Russia

Name	Market Share	Public and other shareholders	Major shareholders
Mobile Telesystems	35% (2006)[59]	46.7%	Sistema[60]52.8%
Vimpelcom	35% (2006)[61]	44.2% public (0.5% treasury stock and 0.9% other)	Telenor 29.9%, Alfa 24.5%,
Megafon	18.1% (2006)[62]		OJSC Telecominvest 31,3%, Sonera Holding

[58] Kazakhstan Stock Exchange, www.kase.kz, accessed November 9, 2006

[59] Data from J'son & Partners

[60] Which has 30 shareholders. Details are available from http://www.sistema.com/section.html?s=143 (last visited 5 May 2006)

[61] Data from J'son and Partners

[62] Data from J'son and Partners

			B.V.26%, OOO CT-Mobile 25,1%, IPOC International Growth Fund Limited 8%, Telia International AB 6,37%, Telia International Management AB 1,73%, and OOO Comtact-C 1,5%.

Ukraine

Name	Market Share	Public and other shareholders	Major shareholders
Kyivstar	43.8%[63]		Telenor, 56.51%, Alfa Group, 43.49%
UMC	40.5%[64]		MTS 100% (see Russia, above)
Beeline (formerly URS)	2.3%		100% owned by Vimpelcom (see Russia above). This acquisition is being challenged by Telenor who have promised to use every avenue available to them to oppose it.
Astelit	12.7%%[65]		Turkcell 54.2%, Donetsk System Capital Management 45.8[66]%
Golden Telecom	0.2%[67]	40%	Altimo, 29%, Telenor, 20%, Rostelecom, 11%

Armenia

Name	Market Share	Public and other shareholders	Major shareholders
Armentel Mobile	47% (Feb 2006)		Armentel 100% (OTE owns 90% of Armentel, the Armenian State owns 10%) (purchase by Vimpelcom not fully

[63] http://www.cellular-news.com/story/19810.php

[64] Data from FinRusGateway, Bulletin May 2006

[65] Data from FinRusGateway, Bulletin May 2006

[66] This company is reportedly interested in purchasing Ukrtelecom, the fixed line incumbent.

[67] Based on official statistics of 30 million subscribers at the end of 2005 and a subscriber base of 47,502 quoted in Golden Telecom Annual Results 2005.

			completed at time of writing in November 2006)
VivaCell (K-Telecom)	53% (Feb 2006)		Wholly owned by a foreign private citizen

Azerbaijan

Name	Market Share	Public or other shareholdings	Major shareholders
Azercell	85%		Fintur owns 79.78% of Azertel, with Cenay Insaat owning 20.22%. Azertel owns 64.3% of Azercell, with the MCIT owning 35.7%
Bakcell	15%		GTIB-96 (Israel), 100%
Catel	Negligible		Ministry of Communications, 50%, US Consortium OMCL (Omni-Metromedia-Caspian Ltd.), 50%

Belarus

Name	Market Share	Public and other shareholders	Major shareholders
MTS	52.67%		MTS (see Russia, above) 49%, Mezhdugorodnaya Svyaz 51% (a subsidiary of state-owned fixed line monopoly Beltelecom)
Velcom	45.33%		Belarus state 30.9%, SB Telecom (Cyprus) 49%, Beltechexport 20%, Beltelecom 0.1%
Belcel	1.77%		Comstruct International 50%, Beltelecom, 50%
BeST	0.23		State owned company Agat, 75%, Beltelecom, 25%

Georgia

Name	Market Share	Public or other shareholding	Major shareholders
Geocell	50%		Fintur 83.2%, 4 private citizens 14.3%, GD+ Ltd, 1.25%, Send Group Ltd 1.25%
Magticom	50%		ITC LLC (owned 50.1% by Metromedia and 49.9% by Dr Jokhtaberidze) 85%, Telcell Wireless
Iberiatel	Negligible		Part of Telenet (a fixed and wireless voice and data transmission company). Telenet is owned by Selford Group and Patarckatsishvili Fund
Mobitel	Inactive		Vimpelcom purchased 51% in 2006 for 12.6 million US$ (10.4 million Euro) with an option for the remaining shares.

Kazakhstan

Name	Market Share[68]	Public or other shareholding	Major shareholders
Kartel (K-Mobile)	47.2%[69] (44.2%[70])		Limnotex (100% owned by Vimpelcom) 50% plus one share, Crowell Investments Limited 50% minus one share
GSM Kazakhstan (KCell)	~45%[71]		Fintur Holdings BV, 51% (see Moldcell, above), Kazakhtelecom, 49%
Altel	7.37%[72]		Kazakhtelecom 100%
Mobile Telecom Service	0%[73]		Kazakhtelecom, 100%

Moldova

Name	Market Share	Public and other shareholders	Major shareholders
Voxtel	60.5%[74]		France Telecom Mobiles, 61%, Moldovan Mobile Telephone-bis 30%, Moldtelecom, 5%, IFC, 5%, Mobilrom 4%
Moldcell	39.5%[75]		Fintur Holding BV 99%[76], Moldfintur, 1%

[68] Bisnis 2005 Fall Telecommunications Report

[69] Number of subscribers according to Vimpelcom divided by the total number of subscribers according to the Agency of Statistics and multiplied by 100%

[70] Vimpelcom Quarterly Report to the US Securities and Exchange Commission, www.secinfo.com accessed November 10, 2006

[71] Estimate based on market shares of Kartel and Altel

[72] According to Press Release by JSC Samruk accessed at http://www.interfax.kz on November 9, 2006

[73] Mobile Telecom Service will start offering services in 2007

[74] ANRTI 2004

[75] Ibid

[76] Which is owned by TeliaSonera (52.55%) and Turkcell (41.45%)

8 ABBREVIATIONS

3G	Third Generation Mobile
ADC	Access Deficit Charge
AIC	Agency for Informatisation and Communications (Kazakh regulatory body)
AM	Armenia
AMC	Anti-Monopoly Committee (Ukraine)
AMD	Armenian Dram
ANRTI	National Regulatory Agency in Telecommunications of Moldova (Moldovan regulatory body)
APOTIM	Association of Patronage from Telecommunications and Informatics (Moldovan trade association)
ARNM	Agency for the Regulation of National Monopolies (Kazakh regulatory body)
ARPU	Average Revenue Per User
ASCR	Azerbaijan State Committee on Radio Frequencies
ATM	Automatic Teller Machine (cash machine)
AZ	Azerbaijan
AZN	Azeri manat
B2B	E-Commerce with businesses as consumers
B2C	E-Commerce with private individuals as consumers
belGIE	Regulatory subdivision of the Belarusian Ministry for Communications
BY	Belarus
ccTLD	Country-code Top Level Domain
CDMA	Code Division Multiple Access (Mobile technology)
CEPT	European Conference of Post and Telecommunications
CIS	Commonwealth of Independent States (see also NIS)
CLID	Calling Line ID
CS/CPS	Carrier Selection / Carrier Preselection
CST	Centre for Special Telecommunications – Public key certification centre in Moldova
DECT	Digital Enhanced Cordless Telecommunications
DVB	Digital Video Broadcasting
DWDM	Dense Wavelength Division Multiplexing
EDGE	Enhanced Data rates for GSM Evolution
EGPRSP	Economic Growth and Poverty Reduction Strategy Paper
EU	European Union
GE	Georgia
GEL	Georgian Lari
GNCC	Georgian National Communications Commission (Georgian NRA)
GNI	Gross National Income
GPRS	Global Packet Radio System (mobile Internet access technology)
GSM	Global System for Mobile Communication
ICC	Interregional Communications Companies
ICT	Information and Communications Technologies
IFPI	International Federation of the Phonographic Industry
IIS	Institute for the Information Society (Russia)
IPR	Intellectual Property Rights

ISP	Internet Service Provider
IT	Information Technology
ITDSC	Information Technology Development Supporting Council (Armenia)
ITU	International Telecommunication Union
IX(P)	Internet Exchange (Point)
KZ	Kazakhstan
KZT	Kazakh Tenge
LLU	Local Loop Unbundling
LPT	Law on Post and Telecommunications (Georgia)
LRAIC	Long run average incremental costs
MCIT	Ministry for Communication and Information Technology (Azerbaijan)
MD	Moldova
MDL	Moldovan Lei
MED	Ministry for Economic Development (Azerbaijan)
MinCom	Ministry of Communications of Azerbaijan
MITC	Ministry of the Information Technologies and Communication (Russia)
MMDS	Multichannel Multipoint Distribution System
MTP	Ministry of Transport and Communications (Georgia)
MTC	Ministry of Transport and Communications (Ukraine)
MVNO	Mobile Virtual Network Operator
NBM	National Bank of Moldova
NCCR	National Commission for Communications Regulation (Ukrainian regulator)
NFTD	National Frequency Distribution Table
NIS	Newly Independent States (see also CIS)
NBM	National Bank of Moldova
NMT	Nordic Mobile Telephone
NNP	National Numbering Plan
NRA	National Regulatory Authority
NREN	National Research and Education Network
NTA	National Telecommunications Association (Kazakhstan)
NTRF	National Table of Radio Frequencies (Moldova)
OTE	Hellenic Telecommunications Organisation
PC	Personal Computer
PIAP	Public Internet Access Point
PSRC	Public Utilities Regulation Commission (Armenian NRA)
PSTN	Public Switched Telephone Network
R-UIM	Removable User Identity Module
RTN	Republic Television Network (Armenian TV transmission system)
RIO	Reference Interconnect Offer
RU	Russia
RUNet	Generic term for services operating under the .RU ccTLD
RUO	Reference Unbundling Offer
SBU	Security Service of Ukraine
SCI	State Communications Inspectorate (Moldova)
SCPC	Single Channel Per Carrier (satellite technology)
SCPEC	State Committee for the Protection of Economic Competition (Armenian Competition Authority)
SCRF	State Committee for Radio Frequencies (Moldova)

SDS	State Department for Statistics (Georgia)
SMP	Significant Market Power
STI	State Telecoms Inspection (Ukrainian spectrum body)
TDM/TDMA	Time Division Multiplexing/Time Division Multiple Access
UITE	Union of Information Technology Enterprises (Armenia)
UA	Ukraine
UNDP	United Nations Development Programme
USO	Universal Service Obligation
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal (Earthbound satellite station)
WLL	Wireless Local Loop

Political Intelligence

INTERNEWS

Russia

Local Experts: Yuri Hohlov and Sergey Shaposhnik
(Institute for the Information Society)

Table of Contents

1 OVERVIEW 4
1.1 Regulation of Electronic Communications 4
1.2 Regulation of Electronic Services 5
1.3 Use of Information and Communications Technologies 5
2 GENERAL ENVIRONMENT 8
2.1 Influence of Stakeholders on Regulation and Policy 8
2.2 National Development Plan 8
2.3 Data Protection 9
2.4 Cybercrime and Spam 10
3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 12
3.1 Interconnection 12
3.2 Numbering 15
3.3 Rights of Way and Facilities Sharing/Collocation 16
3.4 Tariff Policy 17
3.5 Cost Accounting 17
3.6 Universal Service 18
3.7 Local Loop Unbundling 20
3.8 Leased Lines 20
3.9 Mobile Services 21
3.10 Satellite Services 24
3.11 Status of the National Regulatory Authority (NRA) 25
3.12 Licensing and Authorisation 25
3.13 Spectrum 26
4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 27
4.1 Digital Signatures 27
4.2 Payment Systems 28
5 USE OF ELECTRONIC COMMUNICATIONS SERVICES 30
5.1 Fixed Telephony Penetration 30
5.2 Mobile Usage 30
5.3 Cable Services 31
5.4 Computer Availability 32
5.5 Internet Access 33

5.6 Public Internet Access Points (PIAPs) 34
5.7 Wireless Internet Access 34
6 AVAILABILITY OF ONLINE SERVICES 38
6.1 E-Commerce 38
6.2 E-Government 44
6.3 E-Health 46
6.4 E-Learning 50
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY 51
7.1 Fixed Networks 52
7.2 Mobile Networks 54
7.3 Cable Networks 57
7.4 Internet Access Networks 57
7.5 Satellite Operators 59
7.6 Production of IT Services 59
7.7 Financial Development of the ICT Sector 60

1 Overview

The Russian Federation came into being after the end of the Soviet Union in December 1999. According to Rosstat, it has a population of 142.8 million and a landmass of 17,098,200 square kilometres. The GNI per capita was 3,686 Euro (4,460 US$) in 2005, according to the World Bank. The government structure is described as a “semi-presidential” federation. Russia consists of 21 Republics, 49 provinces (one autonomous), 7 territories, 9 autonomous districts and 2 “cities of federal significance” (Moscow and St. Petersburg).

1.1 Regulation of Electronic Communications

A significant proportion of the fixed communications market remains in state ownership. (Notably 75 percent plus one share in Svyazinvest, the company that groups together regional carriers. Svyazinvest, in turn, also owns 51 percent of Rostelecom, which provides long-distance and international services). As yet, it is unclear when the government will sell its remaining shares; there were plans to privatise in 2006 but this has not happened and no new timescale has been announced. The Parliament passed amendments to the Law on Communications in July 2006 in order to facilitate the sale. There is also no independent telecommunications regulatory authority and there are no plans to set one up.

As Russia opens its markets, the regulation of competition and liberalisation is being addressed by the government on a ongoing, if gradual, basis. For example, interconnection, where there had traditionally been little regulation, with prices and conditions being based on contractual agreements, is now subject to far more comprehensive legislation – although mobile interconnection is not as strictly regulated as fixed. There are no immediate plans to reorganise the management of Russian numbering resources, which remain under the responsibility of the Ministry for Communications and Informatisation. However, work is underway to assess the possibilities for mobile, but not fixed, number portability.

There are no procedures for facilities sharing and no appeals procedure in the case of disputes. An order imposing cost accounting on SMP operators was introduced in 2006. Tariff rebalancing is underway, while elements of universal service legislation were introduced in 2003 and again in 2005. A tender process is now well underway for the provision of phone and Internet access nationwide. Tenders are being awarded on a regional rather than a national level. Companies can bid simply for one region and are not obliged to bid nationwide.

Leased line provisioning varies widely – ranging from very active competition and low prices in profitable urban areas to higher prices in less developed regions – with no specific regulatory provisions in place for this sector.

The situation regarding licensing in the telecommunications sector has become considerably less complex since the introduction of the 2003 Federal Law on Communications: one licence is required for mobile operators, two for Internet access

and service providers, and up to five for fixed telephony service providers. Licences are generally issued on a regional basis.

New data protection legislation was passed at the end of 2005, ratifying the Council of Europe Convention on the Automatic Processing of Personal Data (ETS 108).

1.2 Regulation of Electronic Services

Digital signature legislation is in force in Russia (Russian Federal Law on the Electronic Digital Signature of 2001). Licensing requirements that had been in place for service providers are now in the process of being removed. New legislation, based on the current German law, has been adopted, which should greatly improve the ease with which digital signatures can be used.

For online intermediaries, such as Internet access and hosting providers, the legal situation regarding liability for illegal content has become more clear. The new Law on Information, Information Technology and the Protection of Information, which was adopted in July 2006, gives ISPs protection similar to that offered in the EU by the E-Commerce Directive. With regard to the legal framework concerning illegal content, progress is being made with regard to legislation on intellectual property rights infringements. On the other hand, while the procedures and laws concerning online child abuse images need further development, for example in relation to “notice and takedown” procedures, there appears to be increasing industry pressure (from Microsoft, in particular) for a comprehensive solution. However, the absence of a representative body for ISPs in the country makes implementation of such a measure very difficult.

E-payment systems have developed very slowly due to a variety of factors, including lack of trust in online systems, the absence of comprehensive legislation on e-payments, and the low purchasing power of the population.

According to the traffic measurement website http://rumetrica.rambler.ru, there were 3,888 online shops in Russia in May 2006. According to the National Association of Participants in Electronic Trade,[1] the Russian e-commerce market was worth 3,714 million Euro in 2005, shared between B2G (1,797 million Euro), B2B (1,074 million Euro) and B2C (843 million Euro) services.

1.3 Use of Information and Communications Technologies

Fixed line telephone penetration varies considerably from urban to rural regions, although the number of towns and settlements without fixed telephone access has been decreasing rapidly. According to the Ministry for Communications and Informatisation of the Russian Federation, the overall penetration rate was 30.0 percent at the end of 2005

[1] Quoted in “Online Trade Still Unregulated”, Alina Travina, Moscow News, N 46, 2005

and 30.4 in the middle of 2006.[2] Similarly, mobile take-up, as elsewhere in the region, is booming, with a growth in penetration rate from 86.5 to 98.8 percent[3] from 2005 to 2006. This is calculated on the basis of active SIM cards, as reported by mobile operators. Most mobile operators define active SIM cards as those which have been used in the past six months, the exception being Megafon, where it is three months. However, high churn rates combined with high numbers of prepaid customers reduce the accuracy of this methodology. Nonetheless, the rapid growth rate is duplicated (albeit with a lower penetration rate) when other methodologies are used, such as Euroset's calculations based on the number of handsets on the market.[4]

The wireless Internet access market grew steadily in 2005. Mobile communications operators remain the main providers of wireless Internet access: the number of GPRS-users grew 250 percent and surpassed 10 million.[5] 3G licences have yet to be issued, although the tendering process is expected to be launched in early 2007. The number of wireless hotspots also grew by 250 percent. The first pre-WiMAX (Unitline)[6] and WiMAX-networks (Synterra)[7] appeared in the country in 2005.

The number of personal computers in use is rising steadily, with a 6.9 PCs per 100 inhabitants in 2000 to 12.1 PCs per 100 inhabitants in 2006. Taking the average cost of a basic personal computer as approximately 420 Euro,[8] this equates to approximately 8 percent[9] of an average yearly salary, indicating that income levels remain a significant barrier to the take-up of both Internet access and e-commerce services. Nonetheless, one study estimated the number of people who accessed the Internet in a six month period at 23 percent[10] of the population aged 18 and over. Again, this hides a major disparity between urban and rural regions, with Svyazinvest calculating that Moscow accounts for 58 percent of Russia's aggregate Internet traffic.

The proportion of electronic trade as a percentage of total turnover of wholesale and retail trade volumes in Russia was only 0.6 percent in 2005[11] which still represented an increase from 0.5 percent in 2004 and 0.2 percent in 2003.

E-government services have been developing slowly. In 2006, Russia was ranked 43 (out of 198) in a global league table[12] of e-government services. At the moment, e-government services have limited interactivity and are predominantly at the national

---

[2] http://www.inforegion.ru/ru/main/infrastructure/activities/

[3] There are widely varying statistics regarding mobile penetration, although, all measures show significant increases, regardless of methodology. These figures are from the Ministry of Information Technology and Communications

[4] See http://www.cellular-news.com/story/14431.php, for example.

[5] http://www.iks-consilting.ru; http://www.synterra.ru/presscentre/press/43

[6] http://www.unitline.ru/eng/

[7] http://www.synterra.ru/english/

[8] In the study, a figure of 420 Euro is taken as an estimate from our local experts of the cost of a standard (permitting use of Internet and standard office applications) new computer in their countries. This figure is purely indicative in order to gain an insight into the accessibility of computer ownership for the average citizen.

[9] Based on income data from the Russian State Statistics Committee from the first half of 2005, quoted in "Consumer Issues in Tomsk, Russia. http://www.bisnis.doc.gov/bisnis/bisdoc/0507IndustryTomsk.htm - last visited 15 March 2006.

[10] Data collected by the Public Opinion Foundation (http://www.fom.ru) in the summer of 2006.

[11] According to the National Association of E-Commerce Participants

[12] Global E-Government 2004, http://www.insidepolitics.org

rather than regional government level. Russia raised its score from 3.74 (out of 10) to 3.98 from 2004 to 2005 in the Economist E-readiness rankings, attaining its best mark for its business environment (6.16) and worst for consumer and business adoption (2.0). In 2006, Russia's score went up significantly, reaching 4.30, although its overall place in the ranking system did not change, remaining in 52nd place.

2 General Environment

2.1 Influence of Stakeholders on Regulation and Policy

There are a number of trade associations representing enterprises working in the telecommunication sphere, among them the GSM Association, Electronic Data Interchange Association, and the Association of Telephone Operators and Cable Television Association.[13] Industry experts unanimously assess their role as being very limited. There are three groups that have real lobbying power: AFK Systema, Alfa-Group/Altima and Telecominvest (more specifically, the group of companies connected with the Telecominvest–Petersburg group[14]). These groups own large shares of the telecommunications business (including a substantial share in the three major mobile operators) and largely determine the direction of the development of the telecoms industry in Russia. Another influential party is Svyazinvest,[15] a 75 percent state-owned holding company that brings together traditional operators of fixed-line local and long-distance telephone communication networks. The limited effectiveness of trade associations in Russia is a direct result of the significant positions held by the most important domestic companies.

There are no limitations or restrictions for establishing trade associations (for example, minimum quotas on the number of participating companies).

There are also telecoms-specific user groups (for instance, mobile network users); however, they are also considered to be of limited effectiveness and lacking substantial influence. The Association for the Protection of Consumer Rights, on the other hand, is a household name and does have real political power. This association covers the telecommunications market as part of its wider activities, which extend to all consumer markets.

The Union of Internet Operators,[16] an Internet trade body, is focussed on network-related issues, rather than telecommunications or content regulation and is currently inactive.

2.2 National Development Plan

The “electronic Russia” (also known as e-Russia) Plan was launched in 2000, as a ten-year programme to improve Russia’s ICT infrastructure, improve the legislative framework and improve publicly available databases. The programme was approved by Parliament in 2002 and revised in 2006. The initiative was planned in four stages, a planning stage in 2002, an initial development stage in 2003-2004 and an implementation stage from 2005 to 2010. Total investment for the project is estimated at

[13] http://www.aktr.ru/

[14] http://www.telecominvest.com/

[15] http://www.svyazinvest.ru/

[16] http://www.soi.ru

77,179 million RUB (2.24 billion Euro), with 2.6 billion RUB allocated to the first stage, 25.5 billion RUB for the second stage and 49 billion RUB for the third stage.

Since its launch, the focus of e-Russia appears to have shifted to promoting the use of advanced information society products to improving government efficiency. The aim was to achieve this by both improving back- and front-office procedures in government as well as by boosting the amount of information available to citizens via the Internet. Examples of initiatives undertaken are the modernisation of budget planning and accounting by the Finance Ministry (a project worth 220 US$ million or 181.8 million Euro), and a major programme to improve IT use by the customs service, currently being carried out with support from the World Bank.

The e-Russia initiative has successfully led to significant regional development plans such as the e-Moscow, e-Petersburg and e-Altai programmes.

Government spending on IT is high. Indeed, spending levels have been reached which are comparable with countries such as Germany in terms of share of GDP (0.3 percent for Russia and 0.32 percent for Germany in 2004[17]). However, while there have been improvements in the level of funding devoted to e-Russia, the amounts spent fall significantly short of the intended budgets. The overall spend amounted to 20 percent of the initially planned budget in 2002 and 2003, and 28 percent in 2004. Research by Rand[18] suggests that this is due to the lack of "a powerful champion" for e-government, with lack of clarity between the Ministry for Communications and Informatisation and the Ministry for Economic Development regarding overall responsibility for the project.

In 2005, the Ministry for Communications and Informatisation developed a Concept for the Development of the Information Technologies Market in the Russian Federation. However, this has yet to be adopted.

The Concept of Regional Informatisation up to 2010 was approved by the Federal Government in July 2006. Its provisions focus on the development of regional informatisation programmes. The Concept defines the main areas in ICT development and use in the Russian regions, the procedure for the participation of the federal government bodies in the funding of regional programmes and projects and the need for development of regional e-government standard solutions including the methodological support, hardware and software.

2.3 Data Protection

The Russian parliament passed the draft Law on the Ratification of the European Convention on Automatic Processing of Personal Data[19] in November 2005, and this was signed into law by the President on 20 December 2005. This Convention

[17] Peterson, D.J,, "Russia and the Information Revolution", Rand National Security and Research Division, 2005, p.53

[18] Idem

[19] Council of Europe Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data: ETS No.: 108

establishes key principles, which overlap with the 1995 EU Data Protection Directive with regard to definitions in this policy area ("personal data", "processor", etc) and establishes key obligations regarding data security and special categories of data. In addition, in July 2006 the Parliament adopted the laws on Personal Data and on Information, Information Technology and Information Protection, which aim to develop the concept of protection of personal data in the Russian Federation.

However, Russia has yet to sign the additional Protocol to that Convention which deals with "*Supervisory Authorities and Transborder Data Flows.*"[20] The Council of Europe has recognised the ratification of both the Convention and Protocol as key elements in the development of the information society and has encouraged its adoption through the World Summit on the Information Society.

2.4 Cybercrime and Spam

Russia has neither signed nor ratified the Council of Europe Cybercrime Convention and has also neither signed nor ratified the Optional Protocol to the Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography. According to the UK's Internet Watch Foundation, 37 percent of pay per view sites for child pornography that it identified appeared to be located in Russia.[21] Very little action has been taken in response to complaints about such sites forwarded from European hotlines.

Intellectual property organisations have also made complaints regarding allegedly illegal material or activities of Russian websites. Fortunately, some action can be reported on this front. In 2004, with the support of the International Federation of the Phonographic Industry (IFPI), a site selling pirated CDs was closed down and criminal charges brought against the owners.[22]

While the necessary laws appear to be in place to deal with intellectual property rights infringements, there are still gaps in legislation regarding child pornography, particularly regarding possession. Moreover, no hotline has been established to deal with reports of any kind of illegal[23] content in Russia. Business representatives, particularly Microsoft, which has taken a proactive and wide-ranging interest in dealing with illegal content in Russia, are now promoting the concept of hotlines.

The situation regarding hosting providers' liability for illegal content has become more clear. The new Law on Information, Information Technology, and the Protection of

[20] Additional Protocol to the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data, regarding supervisory authorities and transborder data flows. ETS No 181

[21] It can be disputed how many of those sites are, in fact, based in Russia. However, it does appear likely that a significant proportion is actually hosted in Russia.

[22] IFPI, "International Recording Industry Applauds Action Against Russian Website Offering Pirate Discs for Sale", 23 June 2004.

[23] The Russian Law of 8 December 2003 on Sexual Exploitation and Abuse prohibits the exploitation of children for pornographic purposes.

Information adopted in July 2006, should serve to give ISPs similar protection to that which they enjoy in the EU under the E-Commerce Directive (2000/31/EC).

There is no specific legislation regarding the sending of unsolicited electronic communications. However, communications service providers do have the right to terminate the accounts of spammers, while civil cases for damages can also be taken, including by providers whose mail servers have been damaged or overloaded by unsolicited messages. Independently of its privacy laws, the Russian Parliament is also reviewing proposals for a strict opt-in regime for electronic messages sent for the purpose of advertising, with the burden of proof on advertisers to show that prior consent was obtained.

3 Regulatory Environment for Electronic Communications

3.1 Interconnection

Currently, prices for call termination in the Russian market can vary considerably, since payments between operators are governed exclusively by contractual agreements. Legislation on interconnection was, however, approved in March 2005 and came into effect on 1 January 2006 (although freedom of contract will be maintained for agreements between mobile networks).

3.1.1 Fixed Line

Prior to the adoption of the new law on interconnection, Rostelecom had a monopoly over the provision of international long-distance services. Rostelecom provided long-distance services to Svyazinvest regional operators[24] and other communications companies. The regional and local operators would bill their customers for international and long distance services and pay Rostelecom the appropriate fee for providing the service. They would also charge Rostelecom for call termination services.

Under the new, more competitive system, providers of both domestic long-distance and international long-distance services can provide services directly to subscribers of local network operators. Operators of inter-regional telephone networks can offer inter-regional termination and origination of calls to long-distance operators. Moreover, local network operators are able to provide inter-regional network operators with local call origination and termination. These new rights are only available to long-distance operators if they are in technical conformity with the local and long-distance network operators, with a point of presence in every Russian administrative region, and are operationally ready to provide long-distance services to any local network subscriber. Any VoIP traffic either originating or terminating on the public switched network must be processed through a licensed long-distance operator.

In view of these changes, extensive building of networks is currently taking place, as operators prepare to take advantage of the new situation as soon as possible. Industry players have indicated to the study team that calls for proposals for suppliers generally designate January 2007 as the deadline for delivery of services. As a result, it appears that most of the new, competitive services will be launched at approximately that time. So far, only MTT Telecom has launched long-distance services in competition with Rostelecom. Nine long-distance operators were granted licences in November 2005, meaning that both alterative operators and the legal framework are now in place to boost competition in the long-distance market.

[24] The joint-stock company Svyazinvest was created during the transition to market economy mechanisms by merging a majority of the regional State telecommunications enterprises. Svyazinvest covers seven inter-regional communications companies (ICC), integrating 72 regional operators, and holds a 51 percent stake in Rostelecom (an operator of international and inter-regional telecommunications).

There are industry concerns, however, that technical conformity procedures are generally cumbersome in Russia and could be detrimental to the introduction of competition. For instance, concerns were expressed by market players regarding the Russian conformity assessment procedures for interconnection billing systems, which are considered expensive, time-consuming and significantly in excess of requirements in other countries. Due to the unpredictability of the procedures, concerns were raised that this could result in delays to the launch of the new services.

Rostelecom has also had concerns with billing procedures. In a press release[25] in December 2005, Rostelecom explained that it had difficulties in organising its activities to bill subscribers directly and, consequently, announced its intention to enter into contracts with local Svyazinvest and other network operators to act as their agents. Rostelecom also expressed concerns regarding the compatibility of billing and traffic measurement and general worries regarding the impact of these new arrangements on its business.

Further competition is expected to be introduced into the market with the implementation of carrier preselection. Legislation facilitating carrier preselection is now in force, with codes having been allocated to two providers and licences having been provided to a further 18, according to the Ministry for Communications and Informatisation. The preselection code is 8-NN

In total, about 3,300 fixed line communications licences have been issued: 3,200 for local services and 100 for interregional services. 20 long-distance licences have also been issued. The inter-regional and international telephony market had a combined value of 3 billion US$ /2.48 billion Euro in 2005 according to the Ministry for Communications and Informatisation. This represents 13 percent of telecoms revenues. IKS Consulting estimates that 10 percent of this market consists of VoIP services.

3.1.1.1 SMP Obligations

The 2003 Law on Communications states (in Article 19(1) and (2)):

> *In order to guarantee non-discriminatory access to the communication services market, the operator having significant market power in the communication market must, in comparable circumstances, establish equal interconnection agreements and traffic conditions with the network operators providing similar services, as well as supply information and provide connection and traffic services to these operators on the same terms and with the same quality as for its structural divisions and/or affiliated unit.*
>
> *Refusal by the operator having significant market power to conclude a network interconnection agreement is prohibited, except for cases wherein the network interconnection and interaction contradict the network operator licence conditions or regulatory acts determining the establishment and functioning of the unified electronic communication network in the Russian Federation.*

[25] "Rostelecom to switch to a new system of interaction with Russian operators and end users in providing long-distance services," 15 December, 2005, http://www.rustocks.com/index.phtml/Pressreleases/0/1/8647.

The Law on Communications also includes a provision requiring the operator with significant market power, but not the other operators, to publish a reference interconnection offer (RIO). Article 19 of the Law about Communications declares in this regard:

> *Based upon the rules of network interconnection and interaction, the operators having Significant Market Power in the communication market shall establish the conditions for connecting other communication networks to their own network, which specify the usage of the network resources and traffic and include general technical, economic, and information conditions as well as property relations.*
>
> *The conditions for connecting communication networks should stipulate:*
>
> - *Technical requirements pertinent to the network interconnection;*
> - *Volume, procedure, and timeline of network interconnection activities and their distribution between the interacting operators;*
> - *Traffic procedure for the interacting operators' networks;*
> - *Location of the connection points for the communication networks;*
> - *Register of connection and traffic services provided;*
> - *Cost of connection and traffic services and the payment schedule;*
> - *Procedure of interaction between the communication networks' management systems.*

SMP operators are required to publish the aforementioned conditions within seven days of determining the network connection conditions and to submit them to the regulator, RosSvyazNadzor.

Order no. 127 on the Organisation of Activities Concerned with the Consideration of Telecommunications Carriers' Requests Concerning the Issues of Telecommunication Networks Interconnection and Interaction issued by the Minister of Information Technologies and Communications on 10th November 2005 came into force on 1st of January 2006. The new rules place obligations on companies which, on their own or with partners, control 25 percent of capacity or traffic – a ruling very similar to the initial SMP threshold imposed by the first EU telecommunications regulatory framework. Operators under this category need to publish a basic list of prices for interconnection and data transmission services within 20 days of having received its notification from the RosSvyazNadzor. The latter then approves or rejects the prices (see the section below on cost accounting for more details).

Under this law, operators may complain about the refusal to provide interconnection, the prices offered and/or the technical requirements for interconnection, and appeal for clarification of other issues concerned with the relationships between the networks and the operators. If the demands of the regulated operator are inconsistent with the current regulatory framework, the Federal Service for Telecommunications Supervision has the power to make a ruling imposing an alterative solution. Under the procedure foreseen by the new rules, the Federal Service requests (and must receive within 10 days) all necessary documents and information (written explanation, network interconnection specifications, contracts in force, technical and organisational information about the operation of networks, etc.) from the regulated operators. Decisions should be made

within 60 days if at least one of the parties to the network interconnection is a regulated operator, or within 30 days in other cases.

The illegal termination of VoIP calls on fixed or mobile networks has not emerged as a significant problem in Russia.

ISPs cannot normally share dial-up revenue with fixed line telephony providers.

3.1.2 Mobile

In January 2006, new arrangements for mobile-fixed interconnection were also implemented. Up until January 2006, the tradition in Russia had been for the mobile operator to pay all the expenses incurred during interconnection with fixed telecommunications operators. Under the newly implemented regime, mobile operators are permitted to terminate domestic calls from the fixed line network without incurring charges that have to be passed on to their customers. The current call termination price for mobile-to-fixed interconnection is about 1 Eurocent. A few years ago, the price reached 4 Eurocents. Call termination for fixed-to-mobile is free for the fixed operator. With regard to interconnection between mobile operators, the mobile operators pay the cost of the traffic to their partners. As of 1 July 2006, mobile subscribers no longer have to pay to receive incoming calls.

The Russian mobile market is relatively active. There are about 200 companies licensed to provide mobile services in Russia. Currently, there are 56 Russian members of the GSM Association, of which 49 are active and seven have services planned. A complete, up-to-date list with links to network maps can be accessed at:
http://www.gsmworld.com/roaming/gsminfo/cou_ru.shtml

3.2 Numbering

RosSvyazNadzor, working under the jurisdiction of the Ministry for Communications and Informatisation, is responsible for allocating numbering resources in Russia.

Numbering resource allocation in Russia is conducted purely on an “on application” basis; therefore each network service provider has equivalent access to these resources. There have never been any problems or complaints from operators regarding access to numbering resources.

Number portability is not currently available. However, the Ministry for Communications and Informatisation has created a taskforce on mobile number portability, which includes representatives of the Ministry, the telecommunications sector and the scientific community. This taskforce is looking at possibilities for the introduction of, and procedures for, the provision of number portability. The Ministry for Communications and Informatisation published draft documents on general provisions and engineering procedures for the implementation of mobile number portability in April 2006. End-user fees for portability are not currently envisaged. As a consultation on the draft documents

is still underway and the legislative basis has yet to be established, it is unlikely that portability will be available for several years. The deputy IT and Telecommunications Minister is quoted as saying that it is not expected before 2012.[26] Certain issues that have been experienced elsewhere, such as problems with price transparency, will need to be addressed for this to be implemented successfully.

There are no non-geographic numbers available for fixed providers, apart from the special codes used by the emergency services.

The applicable national rule for numbering is Government Resolution 350, which was adopted in 2004. Work is underway at the moment to change the Russian numbering plan to bring it more into line with international ITU standards, with some changes already made and the final alterations currently being implemented.

3.3 Rights of Way and Facilities Sharing/Collocation

At present, about 89 percent of Russia's telecommunications infrastructure belongs to Svyazinvest, with the remaining 11 percent divided among alternative operators. The alternative service providers and their infrastructure successfully compete with the traditional providers on the fixed telephony market in the corporate segment, which creates competition primarily in large cities. In the home user segment of the fixed-line communications market, the de facto monopolists in Russia are the service providers that are part of the Svyazinvest holding group (75 percent+1 shares are owned by the state). This is due to the lack of effective, competition-conducive regulation and the subsidisation of local call charges (at the expense of long-distance calls, which are therefore relatively expensive), as well as the incumbent providers' inherited advantages, namely the entire, extensive infrastructure created in the Soviet era.

The free and equal rights of providers to access infrastructure and network facilities are stipulated in the Federal Law on Communication (2003). In theory, there are equal rights for building new infrastructure; however in practice, operators often experience difficulties when it comes to receiving permission for building work.

Procedures for facilities sharing are more or less non-existent. However, a Decision has been under discussion since 2005 to address this issue and to regulate in favour of non-discriminatory access to network infrastructure. Discussions have yielded a Government Resolution developed by the Federal Antimonopoly Service, although at the time of writing in December 2006, agreement has not yet been reached with the other relevant government bodies (the Ministry of Justice, the Ministry of Information Technologies and the Ministry for Communications and Informatisation).

As for an appeals procedure for any disputes, there is unlikely to be any formal process until an independent regulator is established, which will almost certainly not happen for several years.

[26] Cellular News, "Russia won't get number portability until 2012, 25 July, 2006

3.4 Tariff Policy

The Government of the Russian Federation plans to remove current price regulation. This will ultimately lead to increased prices for local calls and reductions in the prices of long-distance calls. The new Rules on Interconnection,[27] in force since 1 January 2006, require that, by 1 January 2008, the price for the local and zonal origination of calls should include be rebalanced.

Clear progress has already been made towards tariff rebalancing, as can be seen in the relationship between Rostelecom's traffic growth and revenue from 2000 to 2004: while revenue from international calls fell from 193 million US$ to 126 million US$ (159.5 million to 104 million Euro) from 2000 to 2003 (-34 percent), traffic increased in the same period from 897 million to 1,207 million minutes (+34 percent).[28] On the other hand, local tariffs are on the rise: local tariffs increased by 30 percent in the second half of 2005.

As regards the difference between the total number of minutes for incoming and outgoing international calls, outgoing international traffic is by far the more dominant. A significant proportion of outgoing traffic is through IP–telephony, illustrating the importance of the development of the IP-telephony market in the general growth of the Russian telecommunications market. Moreover, a shift is taking place in the price of international calls due to the use of VoIP technologies, with heavy losses to traditional international telephony being estimated by some analysts.[29]

3.5 Cost Accounting

The Ministry for Communications and Informatisation issued an Order on Cost Accounting in March 2006.[30] Subsequently, in May 2006, it has issued an Order by which it approved the methodology for the calculation of economically justified costs and standard profit for interconnection and traffic transmission as well as universal communication services. This methodology is intended for the operators designated as holding significant market power as well as for universal services operators. It defines the procedure for cost and profit calculation basing on book-keeping and accounting separation, the recommendations for which were also approved by the above-mentioned order.

The adoption of these documents is an important step towards ensuring that pricing mechanisms for the provision of the telecommunication services and interconnection will

[27] Rules for State Regulation of Prices for Interconnection Services and Traffic Transmission Services provided by Operators having Significant Market Power in the General Use Telecommunication Networks

[28] Anton Klimenko, Rostelecom, Brunswick UBS Telecom Conference, March 2005

[29] See http://www.gii.co.jp/press/ir30302_en.shtml for more information.

[30] Order on methodological recommendations for separate accounting for telecommunications operators' revenues and expenditures by the types of their business activities, telecommunications services provided, and the parts of the telecommunications networks used for providing said services

be more transparent and more cost oriented. These documents were developed on the basis of EU experience in this field.

3.6 Universal Service

The Government's policy on universal service is articulated in the 2003 Law on Communication, which introduced new rules relating to universal service.

Universal service is also regulated by five Government Resolutions adopted in April 2005:

- On the measures for organising universal network communication service provision;
- On establishing the rules for state regulation of tariffs for universal communication services;
- On establishing the rules for reimbursing the losses incurred by universal service providers when providing universal network communication services;
- On establishing the rules for the tendering process for the right to provide universal services;
- On establishing the rules for accumulating and spending the resources of the universal service fund.

The Order on Cost Accounting (detailed above) also covers costs related to the provision of universal communication services.

The national system for the provision of universal service in Russia is, insofar as can be assessed, absolutely unique and its implementation has only just begun. The four key elements of universal service in Russia can be described as follows:

(1) Definition of Universal Service. The Law on Communications introduces the following definition of universal service and its scope (which is narrower than in the EU):

(a) Universal networked communication services include:

- Telephone communication services, including the use of public phone booths; and
- Data transfer services and Internet access services through public access points.

(b) The procedure and the starting time for communication service provision as well as the tariff regulations for universal services are determined by the Government of the Russian Federation based upon a report from the RosSvyazNadzor and taking into account the following aspects:

- The time it takes for a user to access a phone booth, without using any means of transportation, should not exceed one hour;

- Each settlement should have at least one phone booth providing free access to emergency services;
- All settlements with over five hundred people should have at least one public access point providing access to the Internet.

(2) In order to reimburse the losses incurred by universal service providers for providing universal network communication services, the universal service fund has been established. All public network service providers are obliged to pay into this fund.

(3) Universal service providers are selected in open competitions, which are conducted on a municipal or regional basis.

(4) The prices charged for universal service are regulated.

The five Resolutions specify mechanisms for the creation of the Universal Service Fund. This is funded through a direct levy on communications companies, which is currently 1.2 percent of income from end users (i.e. not including revenue from interconnection and routing).

The regulator has declared the legislation should take into consideration all concerns expressed by those providers who may qualify for the provision of services under the universal service regime.

The adopted regulatory acts stipulate neutral, non-biased conditions for the provision of universal service. There has not yet been any test to see whether this will be accurately implemented, as the regime was only recently initiated.

The tendering process for the provision of universal services is being undertaken under the authority of the Ministry for Communications and Informatisation. The tenders for the last 14 regions are to be conducted in January - July 2007 (two tenders per region, one for pay phones and a second for Public Internet Access Points).[31] Regional Svyazinvest companies are among the winners in the first round of this process for telephony services, while the Russian Postal Service (Pochta Rossii) has won a significant number of PIAP tenders, others being won by local and interregional ISPs. No significant problems regarding the tendering process have so far been reported.

Minister Reiman stated in the Federal Assembly in July 2005 that there were still 46,000 population centres in Russia without fixed line telephone services. (By the end of 2005 this number had fallen to 42,000.[32]) The Minister stated that the intention was to provide access to all population centres with more than 500 inhabitants.

Unlike the European Union's current regulatory framework, other universal service concepts, such as calling line ID and competition in directory services, are not regulated by national legislation, nor are they covered by other relevant regulation. Whilst the selective barring of incoming calls is possible, and is indeed used by subscribers, there is no regulation in place that provides for its availability.

[31] Full details of this process are available from http://www.uso-info.ru/.

[32] http://www.inforegion.ru/ru/main/infrastructure/activities/

Existing regulatory acts do not include any special provisions regarding disadvantaged users (such as Braille bills for blind users). However, the general rules on service provision mention the necessity of providing access to services for disadvantaged users (this is specifically mentioned in the general rules of the Russian Law on Consumer Rights). However, there has been no follow-up to this principle within the framework of sector-specific electronic communications legislation.

3.7 Local Loop Unbundling

Local loop unbundling has not been implemented in Russia and there appears to be little prospect of it being introduced in the foreseeable future. Nonetheless, some recent legislation appears to be edging in this direction. For example, a subscriber can request that his line be used by two different operators (i.e. shared access). This, together with the first tentative steps towards the introduction of comprehensive cost accounting rules, is helping to create a framework within which LLU could more easily be introduced.

3.8 Leased Lines

Leased lines are available in almost all regions in Russia. However, there are significant differences in terms of price and choice between rural settlements and large cities. In the former, prices are high and competition is severely limited; while in the latter prices are lower, with significant competition between suppliers. There is no legislative support to ensure that *all* areas are covered by at least one supplier. The high-speed, dedicated Internet access market is supplemented by DSL providers, particularly in Moscow and St Petersburg.

No obligatory cost accounting schemes have been adopted within the framework of current rules or regulations, with the exception of operators designated as having SMP. In those cases where leased lines are provided by the incumbent operator, its activity is controlled by the anti-monopoly authority, which regulates the price using rules for calculating the appropriate price on a case-by-case basis.

There are no specific regulatory requirements for leased lines (e.g. transparency, non-discrimination and cost orientation). The provision of leased lines is regulated by anti-monopoly legislation and there are only general principles relating to the provision of non-discriminatory access to telecommunications infrastructure. However, there are plans to adopt sector-specific legislation on leased lines in a joint act of two authorities: the Ministry for Communications and Informatisation and the Anti-monopoly Authority.

On average, a leased line can be provided within one to two weeks in Russia. The situation varies in certain cases: for instance, the technical work for the provision of a DSL line can be completed within hours; however when a new physical line must be laid, it can take several months, as it depends on the time it takes to obtain all the necessary permits.

Overall, leased lines of any standard speed are available; price is usually the only limiting factor in their use.

According to Rosstat data, 19.8 percent of medium-sized and large businesses used leased lines at the beginning of 2006. It should be noted, however, that the statistical questionnaire used by Rosstat for collecting this data uses the term “leased line” in a generic sense, making no distinction between xDSL lines and leased lines in the traditional sense.

The most common leased lines in Russia have 2 mbps capacity and cost the end user from 300 US$ (249 Euro) to 500 US$ (419 Euro per month). The leased lines market between operators is closed and prices are not published, as they are usually subject to confidentiality agreements between the parties.

There are no inherent technical limitations for interconnection between leased lines and public telecommunications networks.

3.9 Mobile Services

There are about 250 mobile operators in the Russian market. The mobile market represents about 40 percent of telecoms market revenue and breaks down (in September 2006) as follows: MTS has 34 percent, Vimpelcom 32 percent, Megafon 19 percent and others 15 percent.

Third generation (3G) services are non-existent in the country and no 3G licences have been issued in Russia to date. UMTS was selected as a 3G top priority standard in Russia. Minister Reiman stated in October 2006 that 3G licences will begin to be issued in 2007. 3G networks are developing in Russia de facto due to the efforts of CDMA-450 operators: since late 2005. SkyLink[33] is providing high-speed data transmission services (SkyTurbo) based on CDMA2000 1xEV-DO technology in Moscow and St. Petersburg.

Telephone retailer Euroset has announced plans to launch an MVNO in 2006, although this had not happened at time of writing (December 2006). The study team has not been able to identify any specific regulatory barriers to the creation of MVNOs.

According to Rosstat, in 2005 there were 104 mobile phones per 100 households (55 phones in 2004).

According to official data,[34] the national level of mobile penetration in Russia, at the end of 2004, was 50 subscribers per 100 people - in the Moscow Region it exceeded 100 subscriptions per 100 people. Government figures[35] from the end of 2005 indicated that there were 123.5 million mobile subscribers (86.5 subscriptions per 100 people), with

[33] http://www.skylink.ru

[34] http://www.minsvyaz.ru/site.shtml?id=2753

[35] Widely quoted, for example at TMCNet, “Daily News Headlines for 30 December 2005”, 31 December 2005

134 subscriptions per 100 inhabitants in Moscow and 118 subscriptions per 100 inhabitants in St Petersburg[36]. According to the J'Son & Partners Agency (a consultancy), the number of subscribers reached 147.2 million and the official nationwide penetration rate went up to 103 percent, reaching 151% in Moscow region in September 2006[37].

It should be noted that the official number of subscriptions does not reflect the true proportion of the population using mobile phones. Data from a special study by Euroset[38] (which looked at the number of handsets in use) indicates there are 38 percent fewer actual mobile subscribers than is reported by the mobile service providers, market analysts and the Ministry for Communications and Informatisation.

Market researchers and consultancies offer various further insights into the level of mobile phone use in Russia. According to the Levada Centre, a market research agency, the proportion of the population that uses mobile phones reached 58 percent at the end of 2006 compared with 2 percent in 2000.[39] The ROMIR consultancy suggests that penetration reached 56 percent[40] at the end of 2005. The Sotovik Agency indicates that 65 percent of the population used a mobile phone at least once in April 2006. While Russia uses essentially the same methodological basis as EU countries to establish the penetration rate, the fact that the vast majority of Russian users are prepay customers[41] and ongoing high churn rates means that this methodology produces less reliable results in Russia.

Pre-paid mobile users represent more than 80 percent of mobile consumers.

The cost of an SMS is about five times less than a one minute mobile-to-mobile call, therefore SMS is a popular means of communication. On average, around 15-25 SMS are sent by mobile subscribers per month. The highest recorded number of outgoing and incoming SMS via any service was through one of the youth-targeted tariffs from Sonic Duo (the Moscow branch of Megafon) which reached 120 SMS per month (on average for subscribers of this tariff).

GPRS services are expanding quickly. In Russia, there are currently over ten million GPRS users and since the beginning of 2004, the number of GPRS users has grown exponentially. Taking Megafon North West[42] as an example, GPRS services are included in the basic subscription, with downloads charged at 0.40 US$ (0.33 Euro) per megabyte from 8am until midnight and 0.10 US$ (0.08 Euro) from midnight until 8am. MTS launched iMode services in late 2005.

[36] http://www.inforegion.ru/ru/info/region/statistic/tel_mobile/

[37] http://www.json.ru

[38] http://www.euroset.ru/; http://www.pcnews.ru/news/news.shtml?72037

[39] This information is from Levada – http://www.levada.ru

[40] This data comes from ROMIR (http://rmh.ru/about/from_monitoring.html) monitoring and was published in December 2005.

[41] http://www.sotovik.ru

[42] See http://www.megafonnw.ru

It is estimated[43] that ten to fifteen percent of mobile users in Russia avail of GPRS services. Megafon is the most advanced in rolling out EDGE services, covering 39 regions, followed by Vimpelcom in 13 regions and MTS in eight regions.

As experienced in a number of European Union Member States, there is a steady trend of migration of traffic from the fixed telecommunications network to the mobile communications network, which has begun to influence the wider development of fixed-line telephony.

Geographically, the proportion of the country's territory covered by mobile networks is negligible; however, according to different estimates, between 80 percent and 95 percent of the country's population reside in those areas covered by mobile networks, according to operators.

Revenues from Mobile Communication Services.

		2002	2003	2004	2005
Revenues from mobile communication services (billion USD / billion Euro)		3.2 / 2.6	4.9 / 4	7.9 / 6.5	10.5 / 8.7
ARPU (total), USD / Euro including:		20.5 / 16.9	15.1 / 12.5	11.9 / 9.8	8.7 / 7.2
	ARPU (voice), USD / Euro	19.5 / 16.1	13.8 / 11.4	10.4 / 8.6	7.6 / 6.3
	ARPU (value added services), USD / Euro	1.0 / 0.83	1.3 / 1.07	1.5 / 1.23	1.1 / 0.8

Source: http://www.iks-consulting.ru/iksrating_sot_1_2006.php

In terms of market leaders, by the end of August 2005, VimpelCom was the leading company in the Volga Region, Siberia and the Central Region (excluding the Moscow Licence Area); MTS remains the leader in the Far East and the regions of the Northern Caucasus and the Urals; and Megafon enjoys the largest subscriber base in the North-West.

The top local operators are Baykalwestcom[44] (10.6 percent of the mobile market in the Far East), SMARTS[45] (over 15 percent of the market share in the Volga region), Uralsvyazinform[46] (22 percent of the market in the Urals region), and Yeniseytelecom[47] (8.4 percent in the Siberian market).[48]

[43] Data from FinRusGateway, Bulletin March 2006

[44] http://www.bwc.ru/

[45] http://eng.smarts.ru/

[46] http://www.uralsviazinform.com/index1.cfm

[47] http://www.etk.ru/etel/mode/G/promotype/normal/template/Homepage.vm

[48] All data from J'son –http://www.json.ru

3.10 Satellite Services

NTV+[49] is the only operator in the market providing satellite TV connection services for home users in Russia. There are widely differing estimates of the penetration rate for such services, ranging from less than 1 percent of households (according to the consulting company MIS-Inform,[50] which equates to about 520,000 subscriptions) to 360,000 subscriptions (according to the international television company Zone Vision[51]). Several companies, such as IP Net,[52] offer satellite connection services for the business sector.

A range of services, which include IP uplink/downlink, telephony, and IP connection are on offer for resale by ISPs.

The costs of satellite services can be very attractive in comparison with fixed-line charges in remote regions and telephones with a satellite connection are likely to become increasingly competitive in remote regions.

The satellite communications providers' market share is very small, representing about 0.7% of total Russian telecoms revenues in 2005[53]. The Ministry for Communications and Informatisation's figures show that in 2005, "*radio networks, radio and televised broadcasting, and satellite connection,*" accounted for 3.6% of the telecommunications and broadcasting industry's overall revenues.[54]

As far as universal service is concerned, there are territories that will certainly require satellite connections for their local universal service provision. As explained above, the parameters of universal service are currently being developed and, as yet, there are no in-depth estimates of the geographical extent to which satellite connections will be used.

NRENs are supported by satellite. In Russia, two of the eleven science and educational networks use satellite channels as their communication means: RADIO-MSU,[55] which was created as the research network focusing on nuclear physics; and the university network RUnet.[56]

According to satellite data and telephony service provider Globalstar, the cost of 1 minute call by satellite mobile phone from Russia to a fixed line in Russia is $1.40 / 1.16 Euro,[57] whereas Rostelecom's maximum intercity communications tariff is about $0.30 / 0.25 Euro per minute.[58]

---

[49] http://www.ntvplus.ru/promo

[50] http://www.mis.ru/mis/index.php?pid=1

[51] http://www.zonevision.co.uk/home.php

[52] http://www.ipnet.ru/default/flash/

[53] http://www.inforegion.ru/ru/main/infrastructure/activities/

[54] http://www.minsvyaz.ru/site.shtml?id=3384; http://www.mininform.ru/upload/docs/20060623143624.xls; http://www.inforegion.ru/ru/main/infrastructure/activities/

[55] http://www.radio-msu.net/

[56] http://www.runet.ru

[57] http://www.klonsv.ru

[58] http://ww.rt.ru

Problems regarding licensing for using services from foreign-owned satellites are described in the licensing and authorisation chapter (above).

3.11 Status of the National Regulatory Authority (NRA)

Russia does not have an independent National Regulatory Authority. Regulation of the ICT sector is managed primarily by the Ministry for Communications and Informatisation through RosSvyazNadzor (Federal Telecommunications Agency), which reports directly to it. This Ministry covers post, telecommunications, radio, TV and satellite communications, licensing, standardisation, international cooperation, research, investment strategy and information technologies.

3.12 Licensing and Authorisation

Licensing in Russia is governed principally by the 2003 Federal Law on Communications. This law has greatly simplified procedures for obtaining communications licences in Russia.

There is only one licence required for a public switched mobile network operator to operate lawfully. This is called the Mobile Network Communication licence.

Public fixed-line telephone operators, however, require an array of licences, depending on the service provided: a licence for the local network, for the regional network, for the long-distance network, for the public phone booth network, and for the pubic access nodes.

Internet access providers must obtain two licences: one for data transfer and another for “telematic” (data transmission and storage) services.

According to the Law on Communications, the cost of licences for the provision of most communication services including mobile network communications, local fixed-line telephone network, regional network, long-distance network, and mobile satellite communication, is set at 15,000 roubles or 435 Euro (for any licence), multiplied by the number of regions where services are to be provided.

The cost of licences for other communication services, including the provision of network channels within the territory of one region, data transfer (excluding the transfer of voice information), telematic services and telegraph communication services is set at 1,000 roubles or 30 Euro (for any licence), multiplied by the number of regions where services are to be provided.

Currently, operators that wish to avail of services provided by a Russian satellite have a waiting period of up to six weeks for a licence to be awarded. However, foreign satellite

providers complain that an equivalent licence to use a foreign satellite can take up to six months.

According to the Law on Communications, where tenders are issued for the provision of communication services (in case of frequency spectrum shortage etc.) the cost of a licence for the provision of such services is fixed by the terms of the tender.

Russian Communications Licences

Fixed	Mobile	Data
1. fixed-line local telephone networks, excluding public pay-booth networks and public access nodes	1. personal paging networks	1. data transfer services (excluding transfer of voice information)
2. long-distance fixed-line telephone networks	2. public mobile radio networks	2. telematic communications services
3. dedicated fixed-line telephone networks	3. dedicated mobile radio networks	
4. regional fixed-line telephone networks	4. switched public cellular mobile networks;	
5. public pay-booth telephone networks	5. mobile satellite radio communications	
6. public access telephone nodes.		

3.13 Spectrum

The State Commission on Radio Frequencies, part of RosSvyazNadzor (which is part of the Ministry for Communications and Informatisation of the Russian Federation), oversees spectrum management and allocation, produces a table of prospective spectrum allocation, and monitors spectrum utilisation.

The Directive on the Procedure for Allocating Radio Frequencies for Radio-Electronic Devices of Various Purposes in the Russian Federation regulates frequency allocation.

Any plans for spectrum liberalisation and trading focus primarily on the issue of spectrum conversion. The 2004 report of the Minister for Information Technology and Communication and the corresponding programme for activities in 2005 included provisions to substantially expand the segment of the spectrum allocated for civil use. Most of the available spectrum is reserved for military use. Less than 10 percent of spectrum is currently available for civil use.

As in most countries, frequency ranges available for public use include the 2.4 GHz band, which is used for Wi-Fi.

4 Regulatory Environment for Online Services

4.1 Digital Signatures

In contrast to the EU Directive, the current Russian Federal Law on the Electronic Digital Signature of 2002 defines specific parameters for digital signatures: a digital signature must be received using one of the cryptographic algorithms in use at the time of the law's enactment, making it completely technology specific. No other forms of electronic document verification are included in the provisions and no other federal laws stipulate the possibility to use other forms of digital personal signatures.[59] On the other hand, insofar as signatures meet the requirements of the law, they are recognised as functionally equivalent to handwritten signatures.

A new law, which overhauls the existing legislation, is currently going through the legislative process. As it is based on the German digital signatures law, the new Russian law is in line with EU legislation and appears to resolve many of the existing legislation's shortcomings. The draft has been agreed by the relevant ministries and is (at time of writing in December, 2006) awaiting Parliamentary approval. Plans are also underway to remove provision of digital signatures from the list of activities subject to licensing requirements.

The current law's principle of dividing information systems into general-use and corporate systems essentially transfers the legal basis regarding the use of an electronic signature into the domain of general contractual regulations. These regulations do not allow for the establishment of general conditions for recognising the legal status of a document signed with an electronic digital signature, thus leading to additional legal complications.

Only one article of the current law addresses the issue of recognising foreign electronic digital signatures. However, the legislation does not specify the criteria to be met for a foreign digital signature to be recognised in the Russian Federation as having legal status – these are to be assessed on a case-by-case basis. The use of foreign electronic signatures therefore remains uncertain.

Despite these shortcomings, which substantially limit the use of electronic digital signatures in all potential sectors, recent changes to public procurement rules encourage the use of electronic documentation in Russia. The Federal Law on the Placement of Orders for the Procurement of Commodities, Execution of Works, and Provision of Services for Public and Municipal Needs was adopted in July 2005. This law replaced the 1999 law, which was considered by industry to suffer from a number of omissions, and includes important amendments covering the usage of ICT. In particular, article 16 deals with publishing public information on tenders on the government website; article 23 regulates the provision of tender documentation upon request (made

[59] The new law "On the information, information technologies, and protection of information," adopted in July 2006, in addition to digital signature, provides for the use of 'other analogues of manual signature', the use of which equals electronic documents to paper documents unless otherwise specified in the federal legislation.

in an electronic form); and other clauses regulate the submission and processing of electronic applications, etc. This Law is important in that it is one of the only laws that stipulate the equality of electronic and paper documents. In addition, this law provides for the regional authorities to independently regulate the usage of electronic documentation before the introduction of such regulation at the federal level. However, the new procurement rules have not lead to the use of e-procurement yet, due to the need to pass additional implementing legislation, which has not yet been done.

4.2 Payment Systems

The somewhat limited use of electronic channels for financial services in Russia is partially caused by the relatively low availability of banking payment cards. According to the Institute for the Information Society (IIS), only 16.7 percent of Muscovites possess such cards. Payment mechanisms using banking cards have not yet been fully established or implemented, associated transaction costs are relatively high for the vendor, and payments (even through the Internet banking systems) are time-consuming. Debit and credit cards are only accepted by 8.1 percent of Internet trade companies, and the same number use other electronic payment systems (PayCash, WebMoney, etc.). The transfer from offline payments to online systems is also hindered by insufficient critical mass and inconvenience of use of the Russian payment systems, Webmoney[60] and "Yandex-Den'gi,"[61]. Consumers also have concerns about the security of electronic payment systems. All of these factors lead to a situation in which the domestic B2C system has adopted the "cash to courier" payment scheme.

According to research company MASMI's April 2006 survey, only 10.5 percent of Russian Internet users had made payments with electronic money over the Internet and 5.1 percent had conducted other financial operations online.[62]

In summary, the following factors impede the expansion of individual use of online financial transactions in Russia:

- Underdeveloped online financial services infrastructure (both in terms of the range of services and the number of credit and other financial institutions providing such services);
- Low general level of trust in Russian financial organisations;
- Lack of an adequate legislative basis regulating online financial transactions, which would reduce the potential risks for the user; and
- Low purchasing power of the population, leading to low demand for financial services (due to the majority of the population's lack of substantial disposable income).

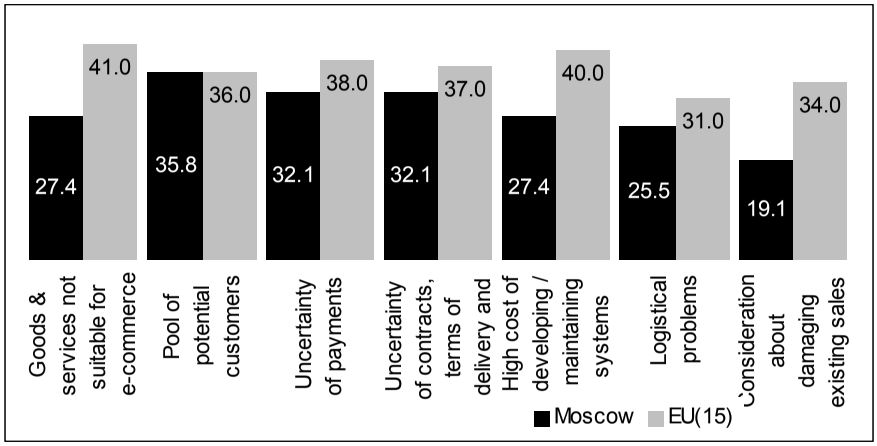
[60] http://www.webmoney.ru

[61] http://money.yandex.ru

[62] http://www.onlinemonitor.ru/Russia2006_1.pdf

Perception of Barriers to e-Sales in Moscow (2004) and the EU15 (2002)

(% of enterprises reporting a particular barrier as important)



5 Use of Electronic Communications Services

5.1 Fixed Telephony Penetration

According to the Ministry for Communications and Informatisation of the Russian Federation, in 2005, the number of telephones on the public network reached 42 million, compared with 38 million in 2004, 36 million in 2003 and 23 million in 1992. Telephone density (the number of subscriber lines per 100 people) amounted to 28.8 percent in 2004 and 30.0 percent at the end of 2005.[63]

Telephone density across the country is extremely disparate. As one would expect, cities have the main share of telephone lines. Although all constituent parts of the Russian Federation have access to the main networks, a considerable number of rural zones still do not have automatic intercity and international communications. The number of towns and settlements without access to the telephone network dropped from 54,000 in 2000 to 42,000 in 2005.[64] Determined efforts to improve access are likely to have significantly reduced this figure in the meantime.

There are considerable differences between the federal regions. The situation in the north-western and central regions is more favourable – their average exceeds the mean value for Russia (for example, Moscow has 58.3 telephone sets per 100 people) whilst the lowest telephone density is in the southern regions (2.8 – in Ingushetia).[65]

5.2 Mobile Usage

Number of Subscribers to the Mobile Communications Network in Russia

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006*
Number of subscribers (million people)	0.09	0.22	0.49	0.75	1.37	3.4	7.84	17.8	35.6	71.3	123.5	141.1
Number of connections (per 100 people)	0.06	0.15	0.33	0.51	0.93	2.33	5.37	12.4	24.7	49.7	86.5	98.8

[63] http://www.inforegion.ru/ru/main/infrastructure/activities/.

[64] http://www.inforegion.ru/ru/main/infrastructure/activities/

[65] http://www.inforegion.ru/ru/main/infrastructure/activities/

** The end of June, 2006*
Source: Ministry for Communications and Informatisation of the Russian Federation

According to IKS-Consulting,[66] there are currently over 4.6 million GPRS users in Russia. Since the beginning of 2004, the number of GPRS users has grown by more than 1200 percent. The proportion of GPRS users among the total number of mobile subscribers is 6.2 percent.[67] However, according to J'son & Partners, a consultancy, the mobile Internet audience still remains rather small (see the table below).

Mobile Internet Users, mid-2005

Parameter	Number of users, '000
WAP	
Weekly WAP audience*	~850
GPRS (2.5G)	
GPRS-enabled handsets in use	~32 000
GPRS services subscribers	~6 500
GPRS weekly audience**	~900
Internet over GPRS weekly audience	~250
EDGE (2.75G)	
EDGE-enabled handsets in use	~1 000
EDGE weekly audience	< 10
IMT-MC-450 (2.75G)	
IMT-MC-450 handsets in use	~240
Internet over INT-MC-450 weekly audience	~70

* Including WAP over GPRS users
** Including access both to WAP (view on handset screen) and HTML (view on PC) sites
Source: J'son&Partners research

5.3 Cable Services

According to data from the World Bank, in 2003 there were 43.6 out of 1000 people subscribed to cable networks in Russia. Data from MIS-Inform, a consultancy, shows actual use of cable television services standing at 3 percent. According to IKS-Consulting, the percentage of households connected to commercial cable TV networks grew from 1 percent in 1998 to 8 percent in 2005.[68]

In terms of cable television penetration, Russia is already ahead of Southern European (countries such as Portugal), but is still behind Northern and Central Europe (countries such as Sweden and Hungary).

[66] http://www.iks-consulting.ru/

[67] This information comes from iKS-Indicator, "GPRS-Break-through" in Russia – 2004 Results, http://www.iks-consulting.ru.

[68] IKS-online No 3.2006. http://www.miks.ru/magazine/magazine_look.php?id=930

5.4 Computer Availability

By the beginning of 2006, the total number of personal computers in the Russian Federation had reached 17.4 million (26 computers per 100 households),[69] having grown by 16 percent compared with the previous year and over 70 percent compared with 2000. Ministry for Communications and Informatisation figures show that the number of personal computers per 1,000 inhabitants had reached 121 by the end of 2005, compared with only 69 in 2000.[70]

With regard to other types of electronic equipment, data is only available for Moscow. The IIS[71] reports that 5 percent of private households own PDAs and 8 percent own satellite set-top boxes.

Rosstat reports that the informatisation of Russian enterprises is progressing rapidly: 88.7 percent of medium-sized and large businesses had computer equipment[72] at the end of 2004; this figure rose to 90.1 percent by the end of 2005. The sectors of the economy exhibiting the highest levels of engagement in the information society include network communications, academia (higher and professional education), the finance sector, and information services.

With the average price of a basic computer at 420 Euro, the equivalent of 14,420 roubles, and with the average annual income in the first half of 2005 equal to 83,580 roubles (6,965 roubles per month), the cost of a computer comprises 17.25 percent of an average, annual salary. Purchasing a PC at this time is a serious burden for the typical family budget and is unaffordable for many households. This is clearly demonstrated by the limited percentage of PC owners among the Russian population. A poll covering various aspects of Russian life[73] conducted by the Public Opinion Foundation in May 2005, showed that only 20 percent of respondents (47 percent in Moscow) had ever worked on a PC while only 8 percent considered themselves familiar with the Internet. This poll also indicated that purchasing a PC was not high on the list of priorities of most Russians.

[69] Data from Rosstat

[70] http://www.inforegion.ru/ru/main/infrastructure/activities/

[71] http://www.iis.ru

[72] This information can be found in the Rosstat survey, Form No. 3-INFORM of 1 January 2004.

[73] Public Opinion Foundation, “Attributes of Contemporary Civilisation in the Everyday Life of Russians”, Available from http://bd.english.fom.ru/report/map/eof051801 (last visited 18 January 2006)

5.5 Internet Access

According to the Public Opinion Foundation (POF)[74], in summer 2006, 57 percent of people who used the Internet at least once over the previous six months had accessed it from home. The six month Internet audience accounted for 23 percent of the population (18+) in summer 2006, compared with 19 percent in summer 2005, 16.9 percent in summer 2004 and 12.1 percent in summer 2003. The equivalent 3-monthly figures were 21 percent, 18.9 percent, 15.5 percent and 10.8 percent respectively.

Women are less active in using the Internet: 19 percent, compared with 27 percent of men.

At the same time, a significant digital divide in using the Internet persists, which is particularly apparent in the regions going through the earlier stages of Internet development. According to POF data (Georating project), in October 2005, the share of Internet users (persons who used Internet during the last 2-3 years) among the adult population varied from 42 percent in Moscow to 4 percent in areas such as the Mordovia and Severnaia Osetia republics. .

As an indication of the cost of Internet access, dial-up access services provided by one of the largest providers, MTU-Intel,[75] costs 20US$ (16.50 Euro) for 50 hours per month, and 60US$ (49.50 Euro) per month for unlimited access.

The cost of ADSL services from MTU-Intel varies between 15 US$ (12.40 Euro) and 75 US$ (62 Euro) per month for private users. Businesses pay monthly subscribers' fees varying from 60 US$ (49.60 Euro) plus 0.14US$/Mb (0.12 Euro) to 720 US$ (595 Euro), with 30 Gb of traffic included (plus 0.01 US$/Mb (0.008 Euro) for additional traffic).[76] The speed of ADSL access provided by MTU-Intel for private users varies between 160/128 and 7500/768 Kbit/sec (for upstream/downstream traffic).

Unlimited Internet access via cable is provided in Moscow by Komkor TV[77] and costs from 20 US$ (16.52 Euro) up to 90 US$ per month (74.38 Euro) depending on the speed, while the monthly fee for prepaid traffic costs 50 US$ (41.32 Euro) for 15 Gb. The speed of access by cable, provided in Moscow by Komkor TV varies from 256/128 Kbit/sec to 3000/512.[78]

Komkor (Moscow Telecommunications Corporation, also spelt COMCOR) also provides broadband access services in Moscow by fibre-optic lines at speeds of up to 100 Mbit/sec (collective access). Fixed transmission capacity of dedicated digital channels varies from 64 Kbit/sec to 622 Mbit/sec. When using a ATM/Gigabit Ethernet network as a mainline transport network, the speed of data transmission reaches 40 Gb/sec.[79]

---

[74] Public Opinion Foundation, "Attributes of Contemporary Civilisation in the Everyday Life of Russians", Available from http://bd.english.fom.ru/report/map/eof051801 (last visited 18 January 2006)

[75] http://www.mtu-intel.ru/

[76] http://www.mtu-net.ru

[77] http://www.comcor.ru/ru/

[78] http://www.acado.com

[79] http://www.comcor.ru

5.6 Public Internet Access Points (PIAPs)

According to data obtained by the Ministry for Communications and Informatisation, there were 8,600 public Internet access points in Russian post offices in 2005, used by a total of 3.5 million people.[80] In 2004, there were 2,311 public Internet access points in post offices with 3,271 workstations available. Accordingly, without taking Internet cafes, and educational institutions into account (no statistical data is available for those access points), there were 0.06 public Internet access points per 1,000 people in the first quarter of 2006. However, this figure is expected to grow significantly with the rollout of PIAPs across the country as part of the government's universal service plans.

The total number of PIAPs in Russia increased from 2,493 in 2000 up to 12,004 at the end of 2005 and 13,587 in the middle of 2006.[81]

According to a 2005 IIS survey of Moscow's Internet use, only 0.3 percent of the Moscow adult population uses libraries for Internet access and 0.2 percent use government buildings for such purposes. The same survey revealed that the majority of commercial centres are connected to the Internet by high speed fibre-optic transmission systems (37.8 percent). Others are connected via xDSL (11.1 percent), LAN (27.4 percent), or cable (4.4 percent).

According to the POF survey,[82] in summer 2006, 9 percent of the half-year audience (i.e. those who accessed the Internet once over the past 6 months), or 2.1 percent of Russia's population, accessed the Internet at Internet cafes.

5.7 Wireless Internet Access

J'son & Partners, a consultancy, estimates that the Wi-Fi market is developing very dynamically, having grown in 2004 by 285 percent. At the end of 2004, there were seven market leaders with ten or more hotspots (see the table below).[83]

Top Wi-Fi Providers

	Company	City	Number of public hot-spots
1.	Tascom[84]	Moscow	40
2.	Quantum[85]	St. Petersburg	22

[80] Information given by the Russian Minister for Communications and Information Technology in the Russian Parliament

[81] http://www.inforegion.ru/ru/main/infrastructure/activities/

[82] Public Opinion Foundation, "Attributes of Contemporary Civilisation in the Everyday Life of Russians", Available from http://bd.english.fom.ru/report/map/eof051801 (last visited 18 January 2006)

[83] This information comes from the Wi-Fi in Russia Informational Bulletin of December 2004, http://www.json.ru.

[84] http://www.tascom.ru/cgi-bin/list.cgi

3.	Moscom[86]	Moscow	20
4.	Stelcom[87]	Moscow	17
5.	Golden Telekom[88]	Moscow	15
6.	Peterstar[89]	St. Petersburg	11
7.	EWI-FI[90]	Moscow	10

Source: J'son&Partners. http://www.json.ru

Service provision is continuing to grow: In 2005 the total number of hot-spots in Russia reached 662. In 2006, the market displayed 165% growth, so it is expected that the number of hotspots will exceed 1,000 by the end of the year.[91]

Enforta (run by Prestige Internet) announced plans in early 2006 for a 50 million US$ (41.32 million Euro) investment plan to roll out WiMAX services in 28 Russian cities. Rollout should be completed by the end of 2007.

According to a 2005 IIS survey, only 0.8 percent of Moscow households used wireless access to connect to the Internet.

5.7.1 General Structure of the ICT Sector

In order to provide a more accurate assessment of the Russian ICT sector's state of development, it is necessary to study its structure. The following sections therefore examine the key ICT sector statistical indicators by major fields of activity (telecommunications, production and other services). A more detailed analysis of the structure of the products and services produced by this sector is then provided. The overall Russian data can then be compared with specific Moscow and St Petersburg data, as well as some international and other countries' statistics.

5.7.1.1 Production by major types of economic activity

In Russia, electronic network communications account for the majority of ICT production. The share of this segment in overall ICT production exceeds its share in the number of people employed in the ICT industry and its share of the gross salary, which indicates high productivity levels.

Interestingly, the production shares for both products and services are less than the proportion of those employed in the corresponding sectors. A conclusion can be drawn that relative labour productivity in other sectors is not as high as in the telecommunications sector (although it is necessary to compare the absolute values of this statistic for more detailed conclusions).

---

[85] http://www.quantum.ru/index.aspx

[86] http://www.moscom.ru/main/en/home.htm

[87] http://www.stelcom.ru/main/default.aspx

[88] http://www.goldentelecom.ru/

[89] http://www.peterstar.com/en/index.html

[90] http://www.ewi-fi.net/

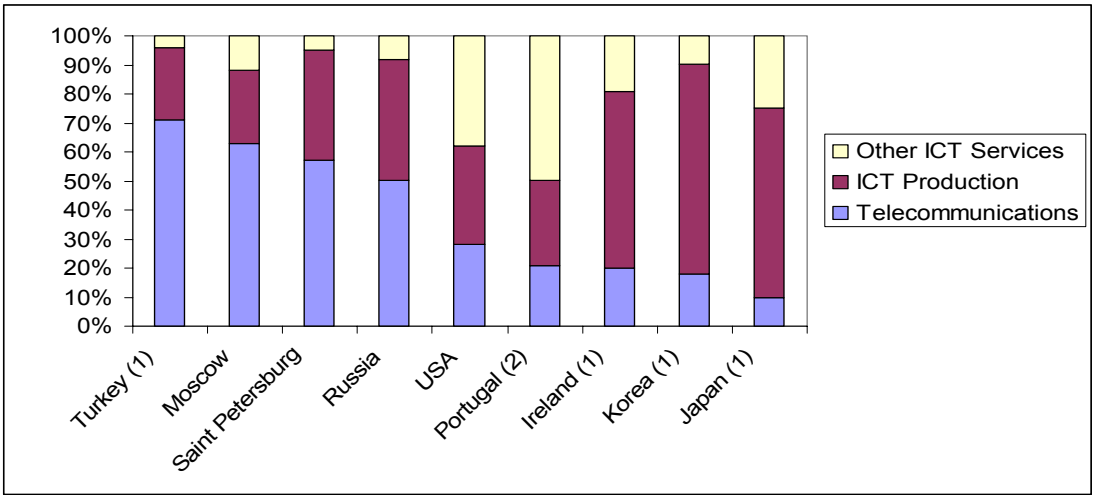
[91] http://en.json.ru/barometer.phtml

5.7.1.2 Distribution of those Employed in the ICT Sector by Major Activity Fields

40 percent of all those employed in the ICT sector work in the equipment production sector. Notably, in Moscow, the percentage of those employed (of all those people working in the ICT sector) in service provision is much higher than the total number for the whole country (it is also much higher than the figure for St Petersburg) – 67 percent of those employed in the ICT sector in Moscow work in the telecommunications sector.

The Russian ICT industry's structure is similar to countries such as Turkey. It is different from the majority of developed countries, in terms of the lower share of ICT hardware compared with IT service provision.

Comparative Proportional Distribution of the Number of People Employed in the ICT Sector, 2003.

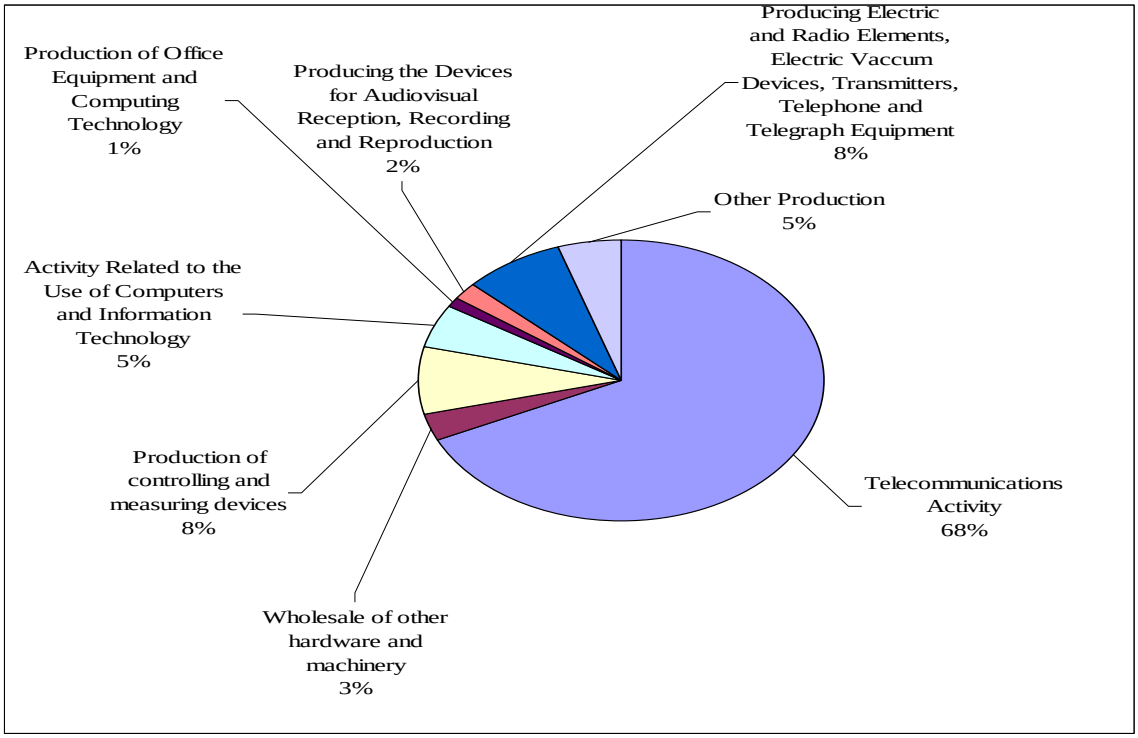


Sources: OECD, Rosstat, Ministry for Communications and Informatisation of the Russian Federation data

5.7.1.3 Detailed Structure of the ICT Sector: Product and Service Production

As was highlighted above, and illustrated in the diagram below, in Russia the absolute leader in ICT products and services is the telecommunications field. Its share of total production levels is higher than its equivalent employment or gross salary shares.

Production of Products and Services for Sale in Russia, 2003.



Sources: Rosstat and Ministry for Communications and Informatisation of the Russian Federation data

Software production and IT services comprise only 5 percent of the whole ICT sector, which is substantially lower than in EU countries. Telecommunications production is mostly concentrated in Moscow, which accounts for 53 percent of all Russian production of telecommunications products and services, and represents 19 percent of the total number of those employed throughout Russia and 31 percent of the gross salary total figures.

6 Availability of Online Services

Russia was placed 52nd in the 2006 Economist's E-Readiness Report list of 64 countries ranked using a system of over one hundred criteria measuring infrastructure, available services and e-skills[92] and the highest among the four countries in this study included in the report. Its overall score was 4.3 (up from 3.98 in 2005), scoring highest in business environment and lowest in consumer and business adoption.

6.1 E-Commerce

Rosstat[93] estimates that only 16.9 percent of Russian businesses had their own websites at the beginning of 2006. This is an extremely low figure in comparison with the EU where the figure is on average 62 percent (from 29 percent in Latvia, to 85 percent in Sweden).[94] Such a small proportion of companies with websites represents a considerable obstacle to e-commerce development, as product marketing, electronic sales and subsequent client support via companies' websites are limited. Russian Internet stores have also adopted little of the best-practice witnessed on American or European sites; there is limited product information and the catalogue structures and navigation can be difficult.

According to Rosstat, by the beginning of 2006, the share of all businesses that used the Internet to communicate with their customers varied significantly depending on the purposes of that usage: 24.9 percent of the surveyed enterprises used the Internet to provide information about the organisation and its products; 16.3 percent to receive orders; 9.9 percent for e-settlements with customers; and 3.0 percent for after-sales customer service.

The share of all businesses that used the Internet for communication with suppliers also differed depending on the purposes of that usage: 34.5 percent of the surveyed enterprises obtained information about goods and services; 20.8 percent provided information concerning the business's product requirements; 19.4 percent placed orders; 10.1 percent paid for products.

According to Rosstat, by the beginning of 2006, 57.8 percent of businesses used e-mail (compared to 53 percent a year before).

With regards Russian consumers, according to MASMI[95] (an international social and marketing research agency), in a population survey conducted in spring 2006, 85.8 percent of Internet users regularly used e-mail and 90 percent used the Internet for information retrieval. Respondents to the survey were asked what they had recently used the Internet for. 72.4 percent had browsed the news, 65.4 percent had browsed weather forecasts, 53.3 percent had used ICQ, 47.2 percent had updated/loaded

[92] Economist E-Readiness Report 2005 - http://graphics.eiu.com/files/ad_pdfs/2005Ereadiness_Ranking_WP.pdf.

[93] Federal State Statistics Service - http://www.gks.ru/wps/portal/english

[94] All data from Eurostat website, 24 November 2005

[95] http://www.onlinemonitor.ru/april2006.html

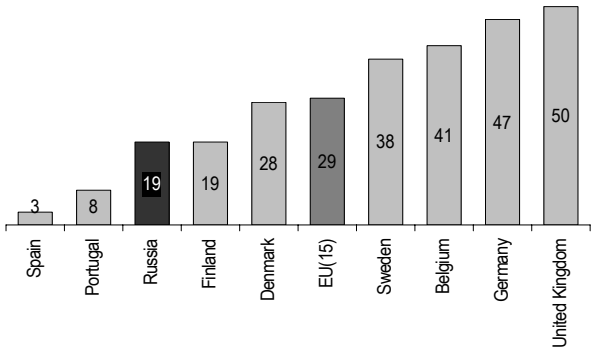
software, 18.7 percent had made purchases and 10.5 percent had made electronic payments for purchased goods and services.

According to Rambler's Top 100,[96] there were 3,510 online news and mass media sites (out of a total of 169,000 websites registered .RU sites) as of 16 May 2006 and, according to the same source, about 3,888 Russian online-shops. According to the National Association of the Participants of e-Trade (NAUET) 18.6 percent of Internet users made at least one online purchase during 2005.[97]

6.1.1 Proportion of businesses placing and receiving orders over the Internet

According to Rosstat data, 19.4 percent of Russian enterprises use the Internet to place orders for materials or products. The IIS[98] reports that in the Moscow area 19.3 percent of businesses with more than 10 employees make purchases through the Internet. This statistic is considerably lower than the EU average (29 percent) and significantly lower than the highest level (50 percent, in Great Britain). Russia also lags behind some countries with transitional economies, including Slovenia and the Czech Republic; however, the use of the Internet for placing orders for products and services in Russia is higher than in Spain (3 percent) and Portugal (8 percent).

Percentage of enterprises having purchased online in EU*, 2004, countries and Russia, 2005, (% of all enterprises)**
Proportion of businesses receiving orders over the Internet



* Enterprises with 10 employees or more
** Excluding small business as of 1 January 2006
Sources: Eurostat NewCronos (http://www.europa.eu.int); Rosstat survey, Form No 3 - INFORM

According to Rosstat data, 16.3 percent of Russian enterprises use the Internet for receiving orders. The IIS survey demonstrated that 16.7 percent of the capital's businesses with more than 10 employees sell their products and services via the Internet. Despite the lower overall Internet penetration in the business sector,

[96] http://www.rambler.ru/ - a Russian website tracking and statistical service

[97] See http://www.nauet.ru for more information.

[98] http://www.iis.ru/en/

international comparisons demonstrate that Russia has intensive rates of adoption of online sales technologies, exceeding not only the Spanish and Portuguese rates, but also those of Hungary and Lithuania. As could be expected, this remains far below the leading EU figures, such as Great Britain, for example, where the figure is 27 percent. Overall, there are encouraging signs for the development of online commercial transactions by Russian businesses.

6.1.2 Enterprise E-commerce Turnover

The National Association of E-Commerce Participants[99] reports that in 2004 Russian e-commerce turnover was three times the level achieved in 2003. Total volumes stood at 2.658 billion Euro and was mainly driven by the business to Government segment (B2G) and connected to the rapid increase in the amount of public contracting and use of electronic tendering. The B2G segment levelled off from 2004 to 2005, growing from 1.76 billion Euro to 1.79 billion Euro, having grown at a very high rate for the previous three years. The Russian e-commerce market was worth 3,714 million Euro in 2005.

Despite the growth of the retail trade in the Russian segment of the Internet, RUnet's overall registration levels (sites registered within the .RU ccTLD) are still far behind Europe and the US.

The share of online sales in the total revenues of Russian businesses is predictably low. The proportion of electronic trade in the total turnover of the wholesale and retail markets in Russia is only 0.6 percent. According to an IIS study, in Moscow, this indicator is substantially higher: in 2004, for businesses with more than 10 employees, the share of product and service sales conducted through the Internet amounted to 3.4 percent of total sales transactions of the capital's businesses, exceeding even the EU's average level of 2.2 percent, but remaining well below Irish (at 12.8 percent, the highest in the EU in 2004) levels. Russia falls even further behind the EU in terms of online sales transactions completed through the Internet or other networks, as such transactions in the EU in 2004 averaged 9.3 percent of total business sales (the highest figure was 13.7 percent in Great Britain).[100]

6.1.3 B2C/B2B turnover ratio

According to data from the National Association of E-Commerce Participants, the total volume of e-commerce in 2005 was distributed among the following market segments: business to Government (B2G) accounted for 48.38 percent (2174 million US$/ 1,797 million Euro), business-to-customer (B2C) totalled 22.7 percent (1020 million US$ / 843 million Euro) and business-to-business (B2B) made up 28.9 percent (1,300 million US$ / 1,074 million Euro). This represents a significant increase in the proportion of B2B and a significant decrease in the proportion of B2G, with all segments rising overall.

Russian e-commerce market (million dollars / million Euro)

[99] http://www.nauet.ru

[100] All EU figures from Eurostat

	2001	2002	2003	2004	2005
B2C	218.3 / 180.4	317.9 / 262.73	480.4 / 397.03	662 / 547.11	1,020 / 843
B2B	99 / 81.82	189 / 156.20	316.2 / 261.32	442 / 365.29	1,300 / 1,074
B2G	-	10.8 / 8.92	141 / 116.52	2,130 / 1760.33	2,174 / 1,797

Source: National Association of E-Commerce Participants, www.nauet.ru

6.1.4 Percentage of Enterprises having made Purchases via Specialised B2B Internet Marketplaces

The basic platforms for conducting inter-corporate business through the Internet are B2B-trading spaces, where purchase and sales transactions between enterprises can take place.[101] The advantages of using such marketplaces include the possibility of saving time on completing agreements, reducing direct costs and reducing administrative and operational expenditures.

IB Partners,[102] a consultancy, report that in March 2004, there were 154 electronic marketplaces in Russia, which encompassed virtually all spheres of business activity. By the end of that year, their number had grown to around 200. The most active participants are market pioneers, especially from the metallurgical and construction sectors, as well as market newcomers, such as from the chemicals and food industries. A number of major marketplaces have been successfully operating in the RUnet space, including b2b-energo.ru (energy), platts.ru (oil and gas products), lesprom.ru (forest industry), metall-trade.ru and metalltorg.ru (metallurgical industry), medprom.ru (medical equipment) and ematrix.ru (IT products).[103]

There are few Russian Internet marketplaces that allow the full completion of transactions online (i.e. from "browsing" to submitting an electronic payment). The exceptions are marketplaces such as b2b-energo.ru, ematrix.ru and faktura.ru. The latter, for example, provides a range of financial and security services, such as secure e-mail and digital signature services. The majority of Russian B2B marketplaces actually

[101] In general, in addition to the possibility of submitting sales/purchasing requests, a number of other services are offered to market participants free of charge, or for an additional fee: news and analysis, importing product catalogues directly from the participating company's inventory, marketing services (advertisements, e-mail lists, etc.), financial services (online payment systems, applications for financial services, such as insurance, loans and leasing), and other services. There are three types of these B2B marketplaces:

- Corporate marketplaces, which are established by the selling party to keep in contact with clients and/or for the enterprise to contact its suppliers;
- Industry and product marketplaces, which are generally established by a third party, created for businesses of the same industry or buying/selling similar or related products; and
- Universal portals, which support the trade of a large range of products and services.

There are also three groups of B2B websites in respect of their functional capabilities:

- Catalogues enabling customers to find the providers of certain products in a certain price range;
- Electronic exchanges used mainly for trading a wide range of consumer products;
- Universal portals, which support the trade of a large range of products and services.

[102] http://www.ibpartners.cl

[103] See http://www.cnews.ru.

only amount to online searchable product and service catalogues, with subsequent transactions conducted offline.

As opposed to online marketplaces in other countries, only 20 percent of Russian online marketplaces are integrated with corporate management information systems. This is largely due to the low level of ICT usage in business processes.

According to the National Association of E-Commerce Participants, the majority of online trade transactions originate directly on businesses' websites.

6.1.5 Online Payments and Banking

Electronic payments are not yet widespread in Russian e-commerce. The major share of banking operations is still conducted through traditional systems. The Russian Banking Association reports that, in 2003, 90 percent of banks still only used the traditional Client-Bank systems.[104]

According to CNews Analytics estimates, by early 2004 only 150 Russian banks provided fully-fledged Internet services for business clients – this represents approximately 17 percent of the total number of Russian banks. Very few banks have switched completely from the traditional banking systems to an Internet-based system.

Rosstat estimates that by the end of 2005 10.1 percent of Russian enterprises used the Internet for online payment purposes. 9.9 percent of businesses received electronic payments for products sold online. The IIS 2005 survey demonstrates that even among Moscow companies engaged in online sales, only 11.4 percent receive payments electronically,[105] whereas in the EU-15 the average is 23 percent, ranging from 10 percent in Italy to 44 percent in Great Britain.

The major obstacles to the widespread use of online payments and e-commerce development, including in the B2B sector, include the insufficient supply of reliable electronic payment technologies and businesses' lack of readiness to use them. Currently, payment services for B2B-market participants in Russia are provided by the multibanking system faktura.ru, the NIKoil bank,[106] Menatep SP Banks and Impeksbank.[107]

6.1.6 Number of Online Retailers

Although the first electronic stores only appeared in Russia in 1999, by early 2005, according to Rambler's TopShop[108], there were around 4,000 Internet stores, including their separate departments, offering electronic showcases, price-lists and possibilities to

[104] See http://www.cnews.ru.

[105] At the same time, in Moscow the percentage of companies using electronic payments with their suppliers is notable: 28.1% of the companies making online purchases paid for them electronically.

[106] http://www.nikoil.ru/portal.nsf/ShowHomepage.Nikoil?Open&LNG=1

[107] This information comes from the Russia e-Readiness Assessment. Analytical Report. IIS. 2004, pp. 173-181.

[108] http://www.rambler.ru/click?from=rumetrica and http://topshop.rambler.ru/

place orders online. Of the total number, 2,900 are located in Moscow and 334 are in St Petersburg. According to a SpyLog (online statistics service) study, there are 1,500 online shops, which offer Internet sales only (i.e. not including electronic showcases of their departments).

Rambler's statistics demonstrate that the Russian stores generally offer household and family goods, home electronics and appliances, computers and software, and sports and leisure goods.

Internet Sales Volumes of the Leading Online Stores in 2004

Store	Volume of Internet sales, million dollars (Euro)	Share of Internet sales as a proportion of total sales volumes, %
M-Video[109]	10 (8.26 million Euro)	2
eHouse Holding Group stores[110]	39 (32.23 million Euro)	N/a
Ozon[111]	6.21 (5.13 million euro)	53 (47- through catalogues) (44 million Euro with 39 million Euro through the catalogue)

Source: National Association of the E-Commerce Participants, http://www.nauet.ru and http://www.e-commerce.ru.

6.1.7 E-commerce use by Individuals

Expert studies have shown that the number of customers using Internet stores in Russia is growing much faster than the number of Internet users in general. Spylog, an online statistics service, reported that, at the end of 2004, the total number of users of Internet stores in Russia was 8.6 million people per month (this number accounts for all those visiting websites and not only those who have completed transactions). This figure represented a 10 percent increase compared with the beginning of that year. According to the results of a study conducted by the Internet-Projects company in 2004, amongst four thousand Internet store visitors, around 11 percent made regular online purchases (one or more purchases a month), while 49 percent had experience of online purchases, but not on a regular basis.[112] The customers of Internet stores comprise around 7 percent of the total monthly RUnet audience.[113] Of this number, 70 percent are from Moscow and St Petersburg, which substantially exceeds the share of these cities in the weekly audience of the Russian Internet (which is less than 50 percent).

The reasons for such concentrations of e-commerce customers in the two main Russian cities are related to a corresponding concentration of computers, Internet access (41

[109] http://www.mvideo.ru/

[110] http://www.ehouse.ru

[111] http://www.ozon.ru/

[112] See http://www.marketingpro.ru

[113] The Public Opinion Foundation (POF) reports that at the end of 2004 the monthly Internet audience in Russia was 13.7 million.

percent of Moscow households had Internet access in Spring/Summer 2004 according to an IIS study) and credit card users in these areas. Other Russian provinces also have lower computer literacy rates. However, there is another significant reason: delivering orders to these other regions presents practical difficulties. Most Russian online stores are registered in the capital, where their warehouses are also located. The delays in the delivery of products to remote regions are substantial, courier services are very expensive and returning purchases is therefore very complicated. The appearance of regional Internet stores, such as in the Volga region, Siberia and the Urals, does contribute to solving this problem. But, in general, the regional nodes of e-commerce development are large economic centres with a large number of affluent Internet users: Yekaterinburg, Novosibirsk, Nijny Novgorod, Rostov-on-Don and Samara, for example.

According to a Moscow population survey conducted by the IIS in 2004, 24.1 percent of the capital's Internet users purchased products and services online in the previous year. The proportion of online buyers in the EU15 in 2004 averaged 38 percent. This varied from 4 percent in Greece to 47 percent in Germany (and from 2 percent in Lithuania to 12 percent in Slovenia in the newest Member States).

The low proportion of online customers and the relatively low total volume of Internet purchases are caused by the following factors:

- the novelty of e-commerce;
- a low level of ICT and Internet access;
- the population's low purchasing power; and
- customers' anxiety regarding the risks of electronic trade (perceived problems of security, delivery, product quality, guarantee, and purchase returns).

According to a Romir Monitoring 2006 survey, the main reasons for not buying online were a lack of information about the goods (44% of internet users who had no experience of online purchases), lack of need (42%), delivery problems (27%) and that the process of buying online was too complicated (25%) [114].

6.2 E-Government

According to Rosstat, by the beginning of 2006, 27,6 percent of Russian federal authorities (including the regional offices of federal executive authorities in the regions, cities and districts, 24.2 percent of regional authorities, and 4.6 percent of local authorities had a website (compared with 10.6 percent, 18.6 percent and 2.9 percent respectively at the beginning of 2004). The federal e-Russia programme (launched in 2002 and due to run until 2010) focuses mainly on ICT usage by public authorities and the government hopes the programme will boost these figures. The Russia sits at the 50th position in the 2005 UN e-Government readiness ranking[115].

[114] http://www.rumetrika.ru/publ/article_show.html?article=849

115 UN Global E-government Readiness Report 2005: From E-government to E-Inclusion

Russia's regions vary dramatically with regard to e-Government readiness. While leading regions' indices are comparable with those of European countries, the more remote regions demonstrate e-readiness which is comparable with that of some African and Latin American countries. Thus, the Moscow score corresponds to 28th position in the 2004 UN e-Government readiness ranking (between Slovenia and Czech Republic), while Ingushetia is at 122 (after Lesoto, Algeria, Tunis and Nicaragua). In other words, the gap between Russia's regions with regard to e-Government readiness is very nearly 100 countries (there are 200 countries included in the rating). There is a trend towards Russia's regions having index values corresponding to higher positions with regard to ICT infrastructure and human capital and lower positions with regard to web-presence. An example of this trend (for Moscow) is illustrated in the table below.

UN e-Government readiness ratings for Moscow[116]

Index	UN ratings corresponding to Moscow's values of indices (scores)
e-Government Readiness Index	**28**
Human Capital index	1
Telecommunication Infrastructure Index	22
Web-Presence index	53

Russia's comparative weakness in the use of the Internet for providing information and communicating with citizens can be explained in more detail by reviewing assessments of regional authorities' websites according to the stages of e-Government implementation (based on UN methodology). Thus, the table below shows Moscow's and Mordovia's scores with regard to the development of web-presence when compared with the highest possible scores according to UN methodology. The gap is most prominent for the indices regarding interactive, networked and, in particular, transactional presence; while the information presence (emerging and enhanced presence) of Russian authorities is more mature.

Assessment of Moscow and Republic of Mordovia authorities' web-sites in terms of the main stages of web-presence development (according to UN methodology)[117]

	Highest possible score	Moscow		Republic of Mordovia	
		Score	% of highest possible score	Score	% of highest possible score
Emerging presence	8	8	100.0%	8	100.0%
Enhanced presence	87	63	72.4%	10	11.5%
Interactive presence	68	24	35.3%	25	36.8%
Transactional presence	41	0	0%	0	0%
Networked presence	54	16	29.6%	0	0%

[116] S.Shaposhnik. e-Government Readiness Index for Russian regions //BossIT, № 2, pp. 21-26

[117] idem

6.3 E-Health

The remarkable achievements of global medicine in the last 20 years were made possible largely by the implementation of new, ICT-based medical technologies. The developments in the ICT field became a driving force in modern medicine and rapidly changed existing methods of diagnosis and treatment, the principles of interaction between doctors and patients and the organisation of therapy and health recovery.

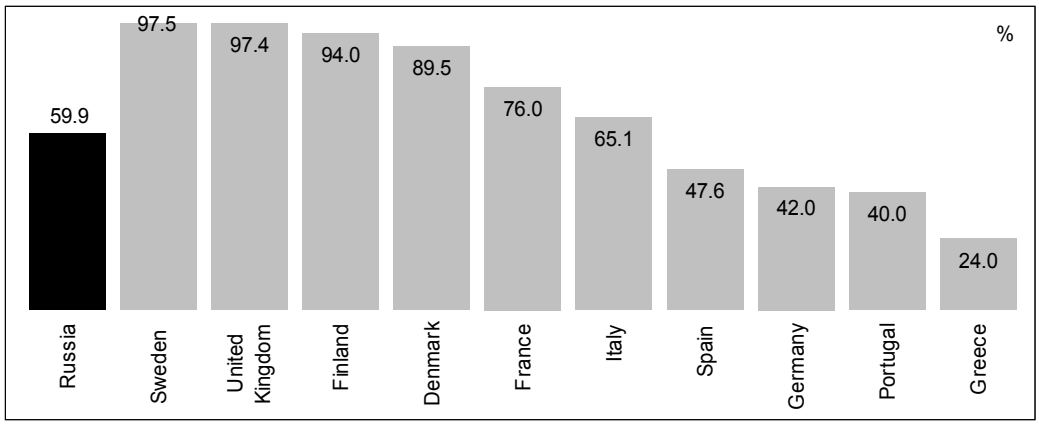
6.3.1 Medical Institutions' Access to ICT

According to Russian Federation Ministry of Health data, in 2003 the proportion of health institutions with personal computers was 76.1 percent, those having e-mail 24.5 percent, and those with Internet access 20.8 percent. The number of computers used (i.e. as opposed to a simple figure representing a computer to doctor ratio) by health institutions reached 36 per 100 doctors in 2003; overall, there was one computer for every 10.2 medical staff.

According to Rosstat, by the end of 2005, the proportion of health institutions with personal computers was 95 percent, while 59.9 percent had Internet access. The number of computers used by health institutions was 8.5 per 100 persons employed (all staff) in those institutions.

Such levels of technical equipment availability, which remain much lower than EU averages, preclude modern ICT use both in modern medical information systems and various telemedicine technologies (see below).

The proportion of medical institutions, organisations and private practices connected to the Internet in Russia, 2005, and EU countries, 2003. (%)



Sources: Prisma Strategic Guideline 2, E-Health April 2003, p47; Rosstat.

Digital equipment and computer availability in medical institutions is also highly uneven, both in terms of region and institution type. There are a number of well-equipped diagnostic centres, hospitals, and polyclinics. Nonetheless, the overwhelming majority of municipal medical institutions have insufficient access to modern equipment and computers.

Computers are primarily used by medical institutions for undertaking organisational and financial tasks (accounting, personnel, medicine inventory maintenance, medical and statistical reporting, registering services provided), and to a lesser extent for supporting treatment and therapy processes.

6.3.2 *Internet Resources and Services in the Medical Sphere: Use by the Population and Medical Personnel*

6.3.2.1 *Use of Health-related Internet Resources by the Population*

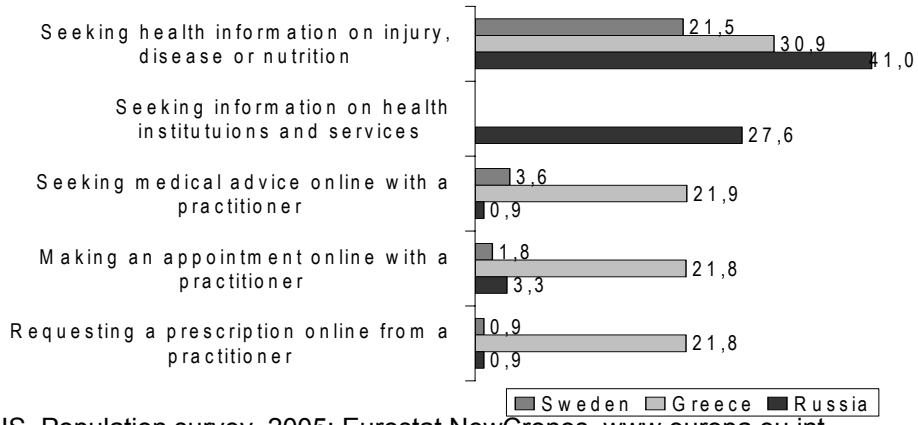
According to the Rambler's Top 100 rating, a web traffic tracker, only 3.7 percent of all informational resources in RUnet were devoted to health issues in 2006.[118] This small percentage limits possibilities for citizens and specialists to use the Internet for medical research. It should also be noted that the proportion of health website visitors as a proportion of all web users amounts to only one percent. While insufficient demand for online health-related resources could explain why the figure is so low, the lack of high-quality resources also plays a role.

The 2005 IIS survey of Moscow residents demonstrated that the popularity of health and medicine related Internet resources is markedly higher in the capital; over 40 percent of the city's three-month Internet audience use these resources. For comparison, EU

[118] http://www.rambler.ru

resident surveys conducted by the European Opinion Research Group showed that the proportion of Internet users searching for health information online amounts on average to 37-40 percent, although the timeframe for most of these users (less often than once a month) is somewhat vague.

Proportion of people who have used the Internet for health related purposes during the last three months (2005) in Moscow and in the EU countries with largest and smallest indicators (2004) (% of the three-month audience)



Sources: IIS, Population survey, 2005; Eurostat NewCronos. www.europa.eu.int

These results should be analysed in conjunction with information and service availability factors:

1. The majority of visited Internet resources in the field of medicine and pharmaceuticals are dedicated to descriptions of medicines. There are over a hundred such resources. Internet pharmacies offer services to residents of larger cities; for instance, they deliver medicines directly to an office or home (there are 30 such pharmacies in Moscow).

2. There is little availability (and hence use) of online doctors' appointment booking services. Almost no medical centres offer the option of making a doctor's appointment through the Internet. Even in Moscow, where the "Long-distance Registration" project is underway, full doctors' schedules are only listed by two medical centres (Centre Medicina and Centre of endosurgery and lithotripsy).

3. There is currently low demand for information about medical institutions. However, at the moment, only large, national, medical and scientific centres and some private medical centres have full-service websites. Municipal clinics do not have their own websites, probably due to the financial resources required for such an undertaking. Information about municipal medical institutions published on the website of the Department of Health of the Russian Federation,[119] and in various "yellow pages" databases, is limited to the name, address, one or two telephone numbers and, sometimes, a map with directions.

4. There are a few websites that provide patients with a basic long-distance medical consultation. However, the main aim of these websites is to lead patients to making a paid visit to a doctor. At the same time, the list of services provided by such doctors is

[119] http://www.mzfrrf.ru

limited to initial diagnoses, basic medical exams and basic treatment procedures, essentially because these are small, private medical centres with limited capacity.[120]

6.3.2.2 Use of health-related Internet resources and Services by Doctors

A large proportion of Russian Internet resources are geared towards medical professionals, including doctors:

- Online medical references (primarily for drugs and medication and, to a lesser extent, for medical equipment);
- Information on projects of large medical research centres and professional associations (publications targeted at medical specialists);
- Thematic projects for medical professionals (dedicated to the various, specific medical fields or certain diseases and methods of their diagnoses and treatment);
- Websites of companies (pharmaceutical producers, distributors, medical institutions, etc.), associations and non-profit organisations in the medical sphere;
- Long-distance services for professionals (distance learning and consultation, forums, clinical practice experience exchange); and
- Systems of reservation and ordering, marketplaces, tenders for purchases.

Currently, there are no Russian sites which provide more sophisticated online services, such as databases and expert systems, which could substantially assist a doctor in making a diagnosis or assigning treatment.

IIS survey data indicates that the main motivation for doctors to use the Internet is receiving professional information, distance learning, selecting medications and consulting with colleagues (see below).[121]

Use of the Internet by doctors from the Moscow medical institutions.

Purpose of using the Internet during the last three months before the survey	Doctors of polyclinics and hospitals (%)
Receiving medical education through distance learning (supplementary training courses)	15.8
Receiving professional medical information	49.3
Selecting drugs and medications	11.2
Publishing the results of medical research, experience sharing and dissemination	9.2
Tele-consultations with colleagues	11.2
Tele-consultations for patients (including e-mail communication)	5.9

[120] G.Iliushin, T.Ershova. E-Health // Information Society, 2004, N 3-4 “Moscow e-Readiness”, pp. 102-104.

[121] G.Iliushin, T.Ershova. E-Health // Information Society, 2004, N 3-4 “Moscow e-Readiness”, p.104.

Other purposes	4.6

Source: IIS medical staff survey, 2004.

Out-patient observation via the Internet is undertaken by a negligible proportion of Moscow's doctors (according to the survey results, approximately only 6 percent). In Europe, only Luxemburg and Greece have lower indicators than Russia in this regard, whereas the average EU level of electronic out-patient observation is 26.5 percent – In Denmark this figure reaches 75.8 percent.

6.4 E-Learning

According to the Rambler's Top 100 rating, a web traffic tracker, only 3.3 percent of all informational resources in RUnet were devoted to education issues in 2006.[122] E-learning has not yet developed to an appreciable extent, despite the obvious potential in view of the country's size and geography. Distance learning is focussed primarily in the tertiary sector, with advanced services being provided by, for example, the Institute for Distance Education of Ulyanovsk State Technical University[123] and the Moscow State University of Economics, Statistics and Information.[124] According to Rosstat, by the beginning of 2006, 93.2 percent of universities and other higher education institutions used the Internet (compared to 89.5 percent in the previous year).

According to the Trans-European Research and Education Networking Association, 72 percent of Russian universities and 10 percent of secondary schools are served by the NREN.[125]

Total number of logical connections to the NREN, and the percentage breakdown for each usable bandwidth class[126]

Total number connected	% connected through ISDN or lower	% connected at up to 2 Mbit/s	% connected at >2 Mb and =< 10 Mb/s	% connected at > 10 Mb/s and =< 100 Mb/s	% connected at > 100 and < 1000 Mb/s	% connected at => 1 Gb and < 10 Gb/s above	% connected at 10 Gb or above
168	2.0	62.0	10.0	21.0	3.0	2.0	0.0

[122] http://www.rambler.ru

[123] http://www.ulstu.ru

[124] http://www.eng.mesi.ru

[125] http://www.terena.nl

[126] http://www.terena.nl

7 Structure of the Communications Industry

The basic ownership structure of the Russian telecoms industry is represented in the tables below.

Share of different types of owners in the Russian telecom market *(%)

Type of owner	Total telecom market	Fixed	Fixed - including Data & Internet	Cellular	Satellite**
State & municipal	27.0	36.4	28.6	2.6	61
Russian holdings	30.4	22.4	29.3	44.8	9
International telcos	10.0	2.6	10.5	20.3	8
Financial investors	2.4	3.2	3.5	1.9	1
Free float	28.3	33.4	20.7	28.2	17
Others ***	1.9	2.0	7.5	2.3	4

* The evaluation of the ownership structure was made on the basis of (a) information on ordinary shares distribution and (b) companies' shares in the overall revenue of the Russian telecom industry in 2004. Where possible, the shares (in telecoms operators) of Russian companies such as Svyazinvest, Gazprom, and Rostelecom were split between owner types according to the ownership structure of these companies to improve accuracy.

** Estimate

*** Owners unaffiliated with large holdings and unknown owners

Source: J'son&Partners research

Key assets for each type of owner

Type of owner	Key assets
State & Municipal	Rostelecom, Svyazinvest regional telcos and their cellular 'daughters', Transtelecom, MGTS (minority stock), 'independent' telcos (Bashinformsvyaz, Tattelecom and others), Central Telegraph, Postal service state enterprises, 'Russian satellites', broadcasting companies
Russian holdings	Shares in MTS, Vimpelcom, Megafon, MGTS, Golden Telecom, Comstar. Full or joint control of MTT, Skylink, PTT. Access Industries share in Svyazinvest assets
International telcos	Megafon (TeliaSonera), Vimpelcom (Telenor), MTS (Deutsche Telecom), Equant (France Telecom), Golden Telecom (Telenor), Tele2, NTC (Korea telecom), Sonera Rus (TeliaSonera)
Financial investors	Minority stocks in Svyazinvest companies, Vimpelcom, Golden Telecom. Peterstar
Free float	Minority stocks in Svyazinvest companies, MTS, Vimpelcom, Golden Telecom, BashInformSvyaz

Others	SMARTS, Recom-MTS (minority), Comcor, Corbina, Ekaterinburg-2000, NTC (minority), Zebra Telecom

Source: J'son&Partners research

The Ministry for Communications and Informatisation reports that 1.8 percent of the workforce is active in specialist jobs in the ICT sector, producing 5 percent of GDP.

According to the Ministry, the Telecommunications market overall was worth 668 billion roubles or 19.4 billion Euro in 2005, which breaks down as follows:

- Fixed line communications market – 340 billion roubles or 9.9 billion Euro.
- Mobile communications – 305 billion roubles or 8.9 billion Euro
- TV, radio broadcasting services and satellite communications – 23 billion roubles or 668 million Euro

7.1 Fixed Networks

Traditional operators continue to control the majority of the telecommunications infrastructure (89 percent of access lines for the fixed-line network) and have a strong position in the fixed-line communications market (70 percent of total market revenue).[127]

The backbone and intercity networks, installed in Soviet times, still form the basis of the Russian public-switched telephone network. During the transition to market economy mechanisms, the joint-stock company Svyazinvest was created through the merger of most of the regional state telecommunications enterprises. The state holds a 75 percent+2 shares block in the company. Svyazinvest now comprises seven interregional communications companies (ICC), and an operator of international and intercity telecommunications, Rostelecom (in which Svyazinvest holds a 51 percent stake). Most of the remaining shares are owned by nominee shareholders such as ING Eurasia Bank.

The privatisation of state-controlled holding Svyazinvest was planned for 2006.However, this did not happen, and it is now very unclear when it is likely to take place. In addition, the final decision concerning the size of the block of shares to be sold (25 percent minus 2 shares, 50 percent plus 2 shares or all 75 percent plus 2 shares have been discussed) and the nature of that sale (by one lot or by several blocks) has not yet been made. It is also not clear whether Rostelecom, the most attractive asset for the investors, will be withdrawn from Svyazinvest in advance of the sale. The main candidates for acquiring

[127] http://www.json.ru

the holding shares are Telecominvest,[128] AFK Sistema,[129] Alfa-Group/Altimo[130] and Access Industries,[131] which already owns 25 percent of Svyazinvest shares.[132]

TransTeleCom (a major backbone provider) has no foreign investors.[133]

The market for local fixed communications services also includes operators building corporate networks and providing complex communications services to major clients (business centres, hotels, banks, etc.). These so-called alternative operators are described in the table, below. The "alternative (new) operators" are the telecommunications service providers who received licences for service provision after 1990 and whose tariffs are not regulated by the Ministry for Antimonopoly Policy and Entrepreneurial Support.

Largest Russian Alternative Providers of Fixed-Line Communication Services, 2003.

	Providers	Controlling Organisation
1.	Sovintel	Alfa Group/Altima
2.	Svyaztransneft	Transneft
3.	MTU-Inform	Systema
4.	Combellga	Alfa Group/Altimo
5.	Equant	France Telecom
6.	TransTeleCom Company	MPS
7.	MTT	Gamma Group
8.	ComStar	Systema
9.	Peterstar	Metromedia
10.	Central Telegraph	Svyazinvest
11.	PTT	Telecominvest
12.	MTU-Intel	Systema
13.	Comcor	Moscow Government
14.	RTComm.ru	Svyazinvest
15.	Telmos	Systema
16.	Cominkom	Alfa Group/Altima
17.	Metrocom	Antel Group
18.	Teleport TP	Grosco Holding
19.	Macomnet	TeliaSonera
20.	TeliaSonera	Antel Group

Source: Russian Telecommunication Market. Information Bulletin, February 2004. http://www.json.ru

According to J'son & Partners' data, about 60 percent of the alternative fixed-line operators' market is controlled by the major financial-industrial groups: Alfa

[128] http://www.telecominvest.com/

[129] http://www.sistema.com/

[130] http://www.altimo.org/

[131] According to the Business and Investment Exchange, 25% of Svyazinvest Holding stock belongs to Access Industries companies, which is headed by Len Blavatnik, through an acquisition of the Cypriot consortium Mustkom (which owned 25% plus 1 share of Svyazinvest stock since 1997) from G. Soros in 2004. (http://www.ribbi.ru)

[132] http://www.mn.ru

[133] http://www.transtk.ru/www/nsf/site.nsf/docs/about.html

Group/Altima[134] (20 percent), AFK Systema[135] (14 percent) and Telecominvest[136] (14 percent). A large group of operators is controlled by Svyazinvest holding companies and state-owned providers (11 percent), which have been actively promoting their services in the telecommunications market over the last two years.

There are substantial differences in the revenue structure of the traditional and alternative operators' clientele. The alternative providers prevail in the corporate sector, whereas the traditional operators are dominant in the consumer segment of the market, primarily due to the low local call tariffs regulated by the Ministry for Antimonopoly Policy and Entrepreneurial Support.

The majority of alternative operators use the traditional operators' public-switched telephone networks. Currently, some of them are building digital superimposed networks in order to provide a direct, high-quality connection between local subscribers and the international stations of Rostelecom. These networks provide voice mail services and high-speed data transfer services.

7.2 Mobile Networks

There are more than 250 mobile communications operators in Russia. Mobile communications companies are expanding, due both to the development of their own networks and consolidation (through mergers and acquisitions). Although up to seven mobile operators can operate simultaneously in several regions, the three operators with the largest subscriber bases are the national GSM operators MTS,[137] Beeline[138] and Megafon.[139]

The controlling block of MTS shares belongs to AFK Sistema. 47.4 percent of MTS shares belong to foreign investment funds.[140]

Beeline is owned by Vimpelcom, which is owned by Telenor (29.9% - 26.6% of voting shares) and Alfa Group (24.5% - 32.9% of voting shares), and 44.2% (39.3% of voting shares) are free float.

The Petersburg Telecominvest holding, together with Scandinavian group TeliaSonera, controls Megafon. Foreign shareholders of mobile operator Megafon are Telia International AB (6.37 percent), Sonera Holding B.V. (26 percent), IPOC International Growth Fund Limited (8.0 percent) and Telia International Management AB (1.73 percent).[141]

[134] http://www.alfagroup.org/

[135] http://www.sistema.com/

[136] http://www.telecominvest.com/en/about.html

[137] http://www.mtsgsm.com/

[138] http://www.beeline.ru/index.wbp

[139] http://eng.megafon.ru/

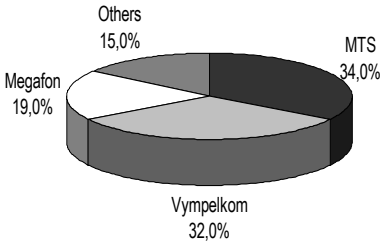
[140] http://www.company.mts.ru

[141] http://www.megafon.ru/main/company

The Petersburg Telecominvest holding also owns part of Skylink[142] Company's fixed capital. Skylink is building a next generation mobile network in Russia, and Petersburg Telecominvest has a 50 percent stake in the project. The rest of the shares are owned by Sistema.

At present, the total share of direct foreign capital in the mobile communications sector is less than 50 percent.

Share of the different operators in the mobile market (September 2006)[143]



Source: www.json.ru

These "big three" companies are present in virtually all Russian regions and also own the largest operators in many CIS countries. They are also starting to assess the possibilities for acquiring Eastern European and Central Asian mobile operators. The rapid and simultaneous expansion of the "big three" into the regions has fundamentally altered the business prospects for the majority of regional companies. These companies have settled on the necessity of quickly selling their assets to one of the largest operators before these market leaders have had a chance to build their own infrastructure and to consequently (and, they believe, inevitably) attract their customers. As a result, the Russian mobile communications market has been consolidating quickly since 2000-2001.

Competition in the consumer market is regulated by the Ministry of Antimonopoly Policy and Entrepreneurial Support. On the whole, the market situation can be characterised as quite sustainable for the leading players. For smaller players, however, the situation remains difficult, above all due to the limited possibilities of building new regional infrastructure.

Largest Cellular Network Operators in the Russian Federation

[142] http://www.deltatelecom.com/

[143] Very similar figures were reported in December 2006 by the Seekingalpha.com website, which said that MTS had a market share of 34.1%, Vimpelcom had 32.4% and Megafon had 19.1%, with the rest on 14.4%. See "MTS vs Vimpelcom: Russian Cellular Market Leaders' Q3 Results, 1 December, 2006

Operator	Number of subscribers on 30 September 2006.
MTS	49,990,000
Vimpelcom	47 651,000
Megafon	28,071,000
Теле2	5,644,000
Uralsvyazinform	4,251,000
SMARTS	3,525,000
Yenisejsktelecom	1,279,000
NSS	1,241,000
Baikalwestcom	1,120,000
Motiv	1,012,000
NTK	707,000

Source: http://www.json.ru

An analysis of operators' activities in setting up mobile communications networks of different standards shows that work to construct regional GSM-900 (GSM-900/1800) networks was conducted very quickly in almost every Russian Federation constituent member, regardless of their socio-economic development. This can be explained by the need of Russian GSM operators to implement existing federal licences within certain timeframes and the policy of these operators to cover regional markets as quickly as possible.

In 2005, Vimpelcom was a market leader in the Volga, Siberian, and Central regions; and MTS held its strong position in the Far Eastern, North-Caucasian and Ural regions. Among the regional players, Baikalwestcom[144] has a strong market position (a 12 percent market share) in the Far Eastern region; Smarts[145] takes up over 14 percent of the market share in the Volga region; Uralsvyazinform[146] has around 22 percent in the Ural region; and Yenisejsktelecom[147] accounts for 9.6 percent in the Siberian region.

In developing mobile communications networks, operators in the Russian Federation focused on two main areas of activity:

[144] http://www.bwc.ru/

[145] http://eng.smarts.ru/

[146] http://www.uralsviazinform.com/index1.cfm

[147] http://www.etk.ru/etel/template/english%2CStaticPage.vm?mode=G&page=-62b111bb-e6f6a724f9--8000

- maximum coverage of the regions' territory, according to their demographic and geographic specifics and investment possibilities;
- expansion of the range of services, including through emerging technologies.

7.3 Cable Networks

The leading players in this market are the state-owned, joint-stock company Mostelecom,[148] Komkor-TV[149] (Moscow), the state enterprise St Petersburg Cable Network, CJSC Arkhangelskoe Cable Television, and a number of other companies in almost every region of the country. At the same time, the fact that a very small number of operators operate in a specific region makes them de facto oligopolists, which means they can maintain quite high tariffs for subscriptions and monthly fees. This places a constraint on service development.

According to Iks Consulting, there were 500 cable operators in Russia at the end of 2005, connecting 8.0 percent of households to commercial cable television and providing Internet access for about 100,000 subscribers.

In 2005, the volume of mergers and acquisitions in the cable communication market totalled over 100 million US$ / 83 million Euro. Nafta-Moscow acquired National Cable Networks (НКС) and Mostelecом,[150] Renova group,[151] and Columbus Nova[152] acquired Корbina Telecом[153] and Komkor-TV.

7.4 Internet Access Networks

Over the last two years, the Russian ISP market has been developing rapidly. The iKS-Consulting company[154] reports that, by the end of 2004, around two thousand Internet service providers offered access services in the country, with many offering a wide range of Internet-services: e-mail, hosting, collocation, applications leasing, etc. An IDC report has also indicated that, in the early part of this decade, the number of users logging on at home was growing faster than the number of corporate users.

The number of ISPs operating in the different segments of the Russian Internet market is presented in the table below.

Number of ISPs in Russian market

[148] http://www.mostelecom.com/

[149] http://www.comcor.ru/ru/

[150] http://www.mostelecom.ru/index.php

[151] http://www.renova.ru/eng/

[152] http://www.columbusnova.com

[153] http://www.corbina.net/

[154] IKS Consulting "Cellular Russia" reports are available from http://www.iks-consulting.ru/eng/index.php

Type of ISPs	Number of ISPs*	National ISPs
Dialup	550	1
XDSL	60	-
other residential broadband	1 700	-
corporate broadband	1 400	4
wireless access	180	-
mobile access	25	3

* These estimations are approximate as there are few clear-cut borders between branches and subsidiaries
Source: J'son&Partners research

Over 50 percent of dial-up access in the Russian telecommunications market is controlled by the ten largest operators, seven of which are members of the Svyazinvest holding group. The number of people using Svyazinvest dial-up access is about 990,000 users weekly. In comparison, Golden Telecom, via the only all-Russia brand ROL[155] has 390,000 users, and the leaders of the Moscow and Saint Petersburg markets, MTU-Intel[156] and Web-Plus, have 270,000 and 140,000 users respectively.

Broadband access using ADSL technology is mainly provided by MTU-Intel, Golden Telecom, WebPlus, Volga Telecom,[157] CenterTelecom[158] and Uralsvyazinform. There were 425,000 ADSL lines in Russia at the end of 2005, representing a penetration rate of approximately 0.3 percent.

The most widespread unlimited broadband access tariff plans cost 16.5 Euro per month or almost 200 Euro per year. This put the retail broadband price at approximately 4.5 percent of per capita GDP.

The market for wireless access grew strongly in 2005. The mobile communications operators still remain the main providers of wireless Internet: the number of GPRS-users grew by 250 percent and now exceeds 10 million.[159]

The first pre-WiMAX (Unitline)[160] and WiMAX-networks (Synterra)[161] have recently appeared in the country.

According to Rosstat, in 2005 14.3 percent of Russian households had access to the Internet at home.

According to J'son&Partners, at the end of 2005 over two thirds of Russian households connected to the Internet used dial-up. Some 1.3 million households used broadband.

In comparison with Europe (with ADSL as the dominant broadband technology) and North America (cable networks), broadband access in Russia is mostly provided through LANs. At the end of 2005 LAN (installed in office blocks or blocks of flats, for example)

[155] http://www.rol.ru/

[156] http://www.mtu-intel.ru/

[157] http://www.vt.ru/?id=730

[158] http://www.centertelecom.ru/eng/

[159] See http:// www.iks-consulting.ru; http://www.synterra.ru/presscentre/press/43

[160] http://www.unitline.ru/eng/

[161] http://www.synterra.ru/english/

accounted for 62 percent of home broadband connections, while ADSL accounted for 32 percent and cable networks for only 6 percent.[162]

7.5 Satellite Operators

The Russian satellite market includes three basic providers (which are also satellite owners) – Russian Satellites,[163] Gazcom,[164] Intersputnik Association,[165] as well as about 90 resellers of Russian and foreign satellite operators.

7.6 Production of IT Services

The ICT sector does not have a prominent place in the Russian economy in terms of production volumes. However, it does exhibit a rapid pace of development and is attractive to investors. The sector, defined in accordance with OECD methodology, provides only 1.5 percent of the country's total employment. At the same time, however, gross salaries account for 2.35 percent, which signifies a relatively high income level in this sector. The production of ICT products and services forms 2.61 percent of the Russian economy's total production volume, which also indicates a relatively high level of productivity. The total volume of product and service production from the various types of ICT-related economic activity in Russia in 2003 exceeded 603 billion roubles, or around 17 billion Euro.

In general, the Russian ICT sector is very attractive to potential investors in relative terms, because the share of investment into fixed assets exceeds both the employment share and the production share of this sector, amounting to 4.76 percent of the corresponding indicators for the whole Russian economy. This means there is potential for advanced growth in the ICT sector in future compared with those sectors of the economy which have lower levels of investment.

The Russian ICT market grew by 30 percent in 2005, increasing from 27.7 billion US$ (22.89 billion Euro) in 2004 to 36.4 billion US$ (30 billion Euro) in 2005.[166] The Russian minister for IT and Communications Mr Reiman said that this was due to extensive domestic and foreign investment.

[162] http://www.json.ru This figure is somewhat different from the one given in the section on cable networks as it was recorded at a different time and by a different consultancy. There are no official figures available.

[163] http://www.rscc.ru/en/index.html

[164] http://www.gascom.ru/index.php?lang=en&screen=sitemap

[165] http://www.intersputnik.com/

[166] See http://www.russoft.org/docs/?doc=1063

7.7 Financial Development of the ICT Sector

7.7.1 Mergers and Acquisitions

According to information agency Sotovik, in 2004, 28 mergers and acquisitions (M&A) were announced in the mobile communications market, with MTS being most active in this sphere. The main goal of such transactions was the acquisition of regional operators or large blocs of their shares (Gorizont-RT, Sibintertelecom, Telesot-Alania, Far Eastern Cellular Communication Networks-900, Siberian Cellular Systems, Primtelephon, Digital Networks of Udmurtia, etc.), which allowed MTS to consolidate its position substantially in the Far East, Siberia and the Volga region.

The acquisition of the Far Eastern operator Daltelecom Inc. by VimpelCom is considered to be the largest mobile transaction of 2004 and one which ensured VimpelCom a 20 percent share in the Far Eastern market. The company also increased its stake in BeeLine–Samara capital.

MS Direct (owned by SkyLink) was rather active in acquiring the NMT-assets of the regional operators. In 2004, MS Direct and some other companies bought blocks of shares from Dalsvyaz, North-West Telecom, CenterTelecom, Uralwestcom and Sibirtelecom within the framework of the SkyLink project.

Russian companies have also been active in the foreign M&A market. In 2006, Alfa-Telecom acquired 13.22 percent of Turkcell for 1,593 million US$ / 1,316.5 million Euro. The other very large acquisition involving a Russian mobile company was the disputed purchase by Vimpelcom of the Ukrainian Radio Systems (URS) for 231 US$ million / 191 million Euro.

According to analysis from IKS-Consulting, a growth in the number of mergers and acquisitions in the fixed-line communications market is expected over the course of the next two to three years. Changes in regulation and plans for the liberalisation of the communications industry are among the principal catalysts for this change. Medium-sized and small operators are expected to attempt to band together to form associations or unions, and the consolidation of small operators will take place. However, Rostelecom, TransTeleCom and a group of large companies will remain in the market.

7.7.1.1 Production by Major Types of Economic Activity

In Russia, electronic network communications account for the majority of ICT production. The share of this segment in overall ICT production figures exceeds its share in the number of people employed in the ICT industry and its share in gross salary, which indicates high productivity levels.

Interestingly, the production shares for both products and services are less than the proportion of those employed in other corresponding sectors of the economy.

According to IDC, a research agency, the market for information security totals 140 million US$ / 116 million Euro. The software company Otkrytye Technologii estimates it at 300 million US$ / 248 million.[167]

The Ministry for Communications and Informatisation reports that, in 2005, software exports reached 994 million US$ / 821.5 million Euro.

7.7.1.2 Distribution of those Employed in the ICT Sector by the Major Activity Fields

40 percent of all those employed in the ICT sector work in the equipment production sector.

Notably, in Moscow, the percentage of those employed (of all those people working in the ICT sector) in service provision is much higher than the total number for the whole country and it is also much higher than the figure for St Petersburg. 67 percent of those employed in the ICT sector in Moscow work in the telecommunications sector.

7.7.1.3 Detailed Structure of the ICT Sector: Product and Service Production

The absolute leader in ICT products and services in Russia is the telecommunications field. Its share of total production levels is higher than its equivalent employment or gross salary shares.

7.7.1.4 Content Industry & Information Services

Number of IT Companies

Type of company	2004	2005****
VoIP providers	570	600
Security service vendors *	70	80
Hosting providers **	750	770
Chargeable	660	680
Free of charge	90	90
Web-design companies ***	1150	1250

* There are very few “pure” security service providers in Russia. Usually, local systems integrators play the role of security service providers. This number represents the pure security service providers as well as the systems integrators which are focused on security services.

** Only hosting service providers (including ISPs and web-design companies) with their own location sites are included.

*** Registered companies with full scale web-design services and whose bills average over $1000 / 827 Euro

****Estimated figures

Source: J'son&Partners research

[167] http://tradecenter.ru/TradeSupport/AnalyticsShow.asp?ID=167

Political Intelligence

INTERNEWS

Ukraine

Local Expert: Andriy Pazyuk

Table of Contents

1 OVERVIEW 4
1.1 Regulation of Electronic Communications 4
1.2 Regulation of Electronic Services 6
1.3 Use of Information and Communication Technologies 6
2 GENERAL ENVIRONMENT 8
2.1 Influence of Stakeholders on Regulation and Policy 8
2.2 National Development Plan 9
2.3 Data Protection 9
2.4 Cybercrime and Spam 10
3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 13
3.1 Interconnection 13
3.2 Numbering 14
3.3 Rights of Way and Facilities Sharing/Collocation 15
3.4 Tariff Policy 16
3.5 Cost Accounting 17
3.6 Universal Service 17
3.7 Local Loop Unbundling 19
3.8 Leased Lines 19
3.9 Mobile Services 21
3.10 Satellite Services 25
3.11 Status of the National Regulatory Authority (NRA) 26
3.12 Licensing and Authorisation 28
3.13 Spectrum 30
4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 32
4.1 Digital Signatures 32
4.2 Payment Systems 32
5 USE OF ELECTRONIC COMMUNICATIONS SERVICES 34
5.1 Fixed Telephony Penetration 34
5.2 Mobile Usage 35
5.3 Cable Services 35
5.4 Computer Availability 36
5.5 Internet Access 36
5.6 Public Internet Access Points (PIAPs) 38
5.7 Wireless Internet Access 39
6 AVAILABILITY OF ONLINE SERVICES 41

6.1 E-Commerce 41
6.2 E-Government 42
6.3 E-Health 43
6.4 E-Learning 43
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY 44
7.1 Fixed Networks 44
7.2 Mobile Networks 48
7.3 Cable Networks 52
7.4 Internet Access Networks 52
7.5 Satellite Operators 53
7.6 Production of IT Services 53
7.7 Financial Development of the ICT Sector 54

1 OVERVIEW

The current State of the Ukraine came into being in 1991. It has a population of 47.8 million people and a landmass of 603,700 square kilometres. The GNI per capita was 1,050 Euro in 2005, according to World Bank figures. Its system of government is described as a "semi-presidential" republic, consisting of 24 provinces, two cities of special administrative significance (Kyiv and Sevastopol) and one autonomous republic (Crimea).

Highly qualified and relatively cheap labour, developed transportation and communications infrastructure, and a favourable geographic location make Ukraine attractive for companies interested in investing in the region. The Ukrainian regulatory system is organised to foster exports and to protect the local market from competing imports because of the economy's dependence on exports. This has led to the implementation of cumbersome customs, licensing and certification procedures. In addition, local companies are often subject to high taxation and untransparent tax collection procedures. Although Ukraine is improving its regulatory environment through reforms taken in the process of WTO membership negotiations, much work remains to be done in reforming the rule of law and corporate governance before Ukraine can compete effectively with its neighbours for foreign investment.

Ukraine has pursued a comparatively conservative approach to telecoms reforms, retaining low subscriptions and free local calls, thereby maintaining growth in fixed line penetration. There is strong potential for the voice market. However, as Ukraine now intends to speed up liberalisation and tariff rebalancing, it has the opportunity to learn from the experience of the new EU Member States in order to avoid artificially hampering the competitive development of fixed networks for voice and Internet.

1.1 Regulation of Electronic Communications

Electronic communications regulation in Ukraine is undergoing major upheaval, due to the adoption of the comprehensive 2003 Law on Communications and the creation in April 2005 of the National Commission for Communications Regulation (NCCR), Ukraine's independent national regulatory agency for communications. Efforts have been made to guarantee the independence of the NCCR by limiting its reliance on government and to provide it with the necessary regulatory powers and resources in order to ensure its efficiency in issuing and enforcing regulations and monitoring the markets.

One of the key issues identified by the NCCR for urgent action is interconnection. Interconnection arrangements are still heavily regulated by the state and are not transparent. The new regulator has extensive powers to deal with this issue through Article 57 of the Law on Telecommunications, and has addressed it as a priority in its first year of operation, for example though its Regulation on Interconnection adopted in October 2005. The NCCR has also assumed responsibility for numbering regulation in order to better deal with an increasingly competitive environment. However, fixed and mobile number portability are neither in place, nor planned.

Facilities sharing and the building of new infrastructure are both governed by the 2003 Law, thus giving the NCCR the opportunity to ensure competitive neutrality and transparency. Licensing has also been simplified by the 2003 Law: it requires licences for fixed (local, intercity and international) and mobile telephony for the purpose of creating “open, non-discriminatory and transparent”[1] conditions for operators. On the other hand, tariff rebalancing, in the context of ensuring a competitively neutral regulatory environment, as well as cost accounting, has yet to be comprehensively addressed.

Universal service is currently a major issue in Ukraine. It is being addressed both through legislation and through pilot projects to ensure basic telephony and Internet access through access points in towns and villages. The government also intends to promote WiMAX as a low-cost way of ensuring further roll-out of Internet access services.

The situation regarding leased lines is somewhat unclear. The vast majority of leased lines are provided by the incumbent telecommunications operator. Prices and availability appear to vary considerably between Kyiv and rural areas.

Regulation of collecting and holding data and information security in Ukraine is governed by a range of legal documents. The main laws are: Information Law № 2657-XII of 2 October 1992 (as amended in 2000, 2002, 2003 (twice), 2004 and 2005), the law on Information Security in Information-Telecommunication Systems No 2594-IV of 31 May 2005 (replaced the 1994 Information Security in Automated Systems Law), the 2003 Law on Telecommunications; and the Presidential decrees: "On Measures of Development of the National Component on the Internet Global Information Network and Providing Broad Access to this Network in Ukraine" of 31 July 2000, "On Measures of Information Protection Resources of the State" of 10 April 2000 and On Several Measures of the State Information Resources Protection in Data Transmission Network, of 24 September 2001.

With regard to data protection, Ukraine took the initiative in 2005 to sign two[2] Council of Europe Conventions on the processing of personal data which, when ratified, will bring Ukrainian legislation further into line with EU norms. It appears that the ratification instruments for these Conventions will be adopted at the same time as a law on data protection, which had its first reading in 2003. Basic data protection obligations for the e-communications sector were also included in the 2003 Law on Communications.

The National Commission for Communications Regulation predicts that rural settlements will be served by the telecommunications network within near five years if bill 9193 (proposed in November 2006) on the creation of a universal service fund is approved.

Communications market participants, particularly the Internet Association of Ukraine, oppose the bill in its current form, especially with regard to how the necessary funds will be collected. In addition, there is some concern over the bill’s proposal to grant increased authority to the State Communications Inspectorate and the NCCR. The operators believe that increased powers will allow the agencies to interfere in the activities of cable TV network operators and TV and radio stations.

[1] Article 43.1 of the Law on Communications

[2] On automatic processing of personal data and on supervisory authorities for data processing.

Ukrtelecom asked the cabinet to accelerate the creation of the universal service fund in order to compensate it for losses it suffers in providing communications services in rural areas.[3]

1.2 Regulation of Electronic Services

Businesses have encountered some practical problems with the Ukrainian legislation on digital signatures and digital documents. Following an extended period during which little progress was made to resolve these issues, there has recently been some activity: the first certification centre opened in Ukraine in January 2006, slightly behind the mid-2005 timetable originally set by the government.

The issue of the liability of online intermediaries has not yet been actively addressed by the Ukrainian authorities, although the limited existing case law shows a broadly similar approach to that in the EU. Legislation on intellectual property rights infringements is being addressed within the context of WTO negotiations, while there is also Ukrainian legislation in place with regard to online child abuse images. New legislation is planned to deal with a range of online content issues, including pornography and hate speech.

Electronic payment systems have not yet developed to an appreciable degree in Ukraine: electronic cash, such as the Armenian e-dram system, is not widely used, while credit card ownership is low.

Generally, online retailing and service provision is hindered by the low level of Internet penetration, coupled with a low level of credit card usage. According to the e-Ukraine website,[4] key issues slowing down e-commerce in Ukraine are an under-developed payment system, lack of necessary legislation, expensive and untrustworthy delivery systems, and lack of overall trust among consumers.

1.3 Use of Information and Communication Technologies

Fixed telephony penetration has been steadily rising, and currently stands at 23.2 percent,[5] with mobile at 84.9 percent[6]. As these figures are significantly lower than in developed countries, there appears to be significant growth potential.

In addition, there is a major urban-rural divide which is being addressed through legislation and through pilot projects to create public access to key communications services in rural areas. There are few cable service offerings on the market, although

[3] See http://www.regulateonline.org/index.php?option=content&task=view&id=686&Itemid=32&relaItemid=767 for more information

[4] http://ukraine-today.com/computers/e-commerce/e-com.shtml (last visited 15 March 2006)

[5] Based on population and fixed telephone line data from Ukrstat. Both sets of data were published in October 2005.

[6] http://www.cellular-news.com/story/19810.php

one operator (Volia) is offering a “triple play” of phone, TV and broadband Internet access in Kyiv.

Computer penetration is limited by the low average wage, since a computer costing 420 Euro would cost approximately 19 percent[7] of an average annual gross salary, for example.

While the government has passed legislation regarding the expansion of e-government services, little progress on practical implementation has been made. However, the development of e-government is part of the EU-Ukraine Action Plan, along with other information society initiatives, such as e-health and e-education. The ITU also supports the development of e-health in Ukraine, as part of its wider efforts on this issue. Ukraine’s score dropped from 3.79 (out of 10) to 3.51 from 2004 to 2005 in the Economist e-readiness rankings, achieving its best mark for business environment (5.49) and worst for consumer and business adoption (1.8). In 2006, Ukraine improved slightly, up to 3.62, while dropping a further four places, down to 61st (from 57th in 2005 and 2004).

[7] Based on Ukrstat data from January 2006.

2 GENERAL ENVIRONMENT

2.1 Influence of Stakeholders on Regulation and Policy

In Ukraine, representative organisations of the telecommunications industry have a comparatively short history of working together to advance and protect the interests of the sector. Until now, only one has been specifically lobbying for more attention from the Government on telecommunications issues – the Ukrainian Union of Entrepreneurs and Industrialists (USPP),[8] which includes two committees that deal with the formulation of proposals for the Government on the development of the telecommunications industry.

The formation of business associations in Ukraine is defined by the Law On Business, which establishes the rules regarding the creation of trade associations. The Law states that if the association unites more than 50 participants in the market, it must obtain permission from the anti-monopoly committee for the registration of participants belonging to the association.

There are currently two industry associations in the Internet sector, the Internet Association of Ukraine,[9] which owns the Ukrainian Internet Exchange (UIE),[10] and the Ukrainian Wireless Association.[11]

The Internet Association of Ukraine was created in the interests of all participants in the Internet market and has successfully ensured a reduction in the price of internal traffic in Ukraine. Its main task is to protect the interests of Internet users and to promote their interests with regard to new legislation.

The Wireless Internet Association was established in order to deal with a wide variety of perceived problems with launching wireless services in Ukraine, including conflict resolution, the legal framework, illegal content and the harmonisation of standards and norms.

In addition, the NGO Ukrainian Internet Community[12] is a nationwide Internet-users' association. It was actively involved in the public discussion of the draft Law on Telecommunications Interception in 2004-2005.

The effectiveness of associations and organisations has increased significantly over the last two years, leading to increased dialogue between businesses, the public sector and the Government. Following the "Orange Revolution," the new Government expressed its interest in actively collaborating with both industry and wider society.

[8] http://www.uspp.org.ua/uspp.php

[9] http://www.inau.org.ua/inau/bin/view/Main_ua/AboutAssociation

[10] http://www.ua-ix.net.ua

[11] http://www.wirelessua.com

[12] http://www.uic.org.ua/index.php

2.2 National Development Plan

The proposed National “e-Ukraine” Programme went through its first reading in Parliament in February 2006. The previous draft Law on the Enforcement of the National “e-Ukraine” Programme for 2006-2015, developed by the Government of Mr Yanukovich, failed to receive the necessary majority in Parliament at the hearings held on 15 December 2004, possibly due to the political upheaval taking place at the time. While little concrete progress on implementing the Programme has been made until recently, there is range of legislative instruments in place to support it once it is adopted. These include:

- The 1998 Law on the National Programme of Informatisation;
- The Cabinet of Ministers Decision of January 2005, appointing the Minister of Transport and Communications as the National Executive Manager of the National Programme on Informatisation;
- The Cabinet of Ministers Decision of April 2005 on the National Strategy for Development of Electronic Communications, the Establishment of the Commission for Telecommunications Regulation and the Adoption of the e-Ukraine Programme;
- The Cabinet of Ministers Decision of May 2005 on the Fulfilment of the EU-Ukraine Action Plan in the Information Society field;
- The Parliamentary Recommendations of September 2005 on Information Society Development;
- The Presidential Decision of October 2005 on Urgent Tasks for the Implementation of Advanced Information Technologies;
- The adoption in November 2005 by the Parliament of the National Programme of Informatisation Tasks (which lists the tasks but does not assign budgets);
- The Government Decision of December 2005 on the National Programme on ICT in Education and Science 2006-2010. The total budget for this programme is 1855 million UAH (30 million Euro).

The new plan for 2006-2015 covers the development of the network, development of human potential and the propagation of information technology. Key priorities of the new plan include the introduction of the most up-to-date technologies into all aspects of life in Ukraine, improvement of computer literacy levels and the creation of a communications infrastructure to integrate the country more effectively into global networks.

The National Informatisation Programme, agreed each year since 1998, serves more as a short-term planning exercise than a national development plan.

2.3 Data Protection

At present, there is very little personal data protection legislation in Ukraine, although a draft Law on Personal Data Protection is in the pipeline. The legal basis for privacy protection, other than the very limited privacy provisions included in the Law on Communications, is the Constitution. The provisions in the Constitution are framed in a similar way to Article 8 of the European Convention on Human Rights. While new laws

have been prepared over the past three years to address the absence of specific legislation, these are still awaiting approval by Parliament. This delay is caused by the fact that there is limited social demand for this kind of regulation. The degree to which privacy concerns do not appear to be a high priority among the population at large is suggested by the apparent lack of public concern regarding insecure state databases, which allegedly make personal data available on the black market.

The draft Law on Personal Data Protection was passed by Parliament on 16 March 2006, but was not signed into law by the President, due to concerns that it was not sufficiently in line with EU legislation, in particular Directives 1995/46/EC (the General Data Protection Directive) and 2002/58/EC (the e-Privacy Directive).

However, in 2005, Ukraine signed the Council of Europe Convention on the Automatic Processing of Personal Data and, unlike all of the other countries in this study, also signed the Additional Protocol on the Protection of Individuals with regard to the Automatic Processing of Data, which deals with supervisory authorities and transborder data flows. It is not yet clear when Ukraine will ratify the Convention and the Additional Protocol. Due to domestic legal considerations, it seems likely that the draft Law on Personal Data Protection (which passed its first reading in parliament in 2003) will be adopted at the same time as the ratification instruments for the Council of Europe conventions.

The basic provisions on data protection included in the Law on Telecommunications 2003 include the prohibition of the dissemination of personal data obtained by operators from users. The Law also guarantees the privacy of communications in general terms.

2.4 Cybercrime and Spam

In September 2005, the Cybercrime Convention of the Council of Europe was ratified by President Yushchenko, with reservations regarding the possession of child pornography and misuse of devices. Ukraine has also signed and ratified the Optional Protocol to the Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography.

In late 2003 and early 2004, the Ukrainian Parliament adopted two key resolutions on “Activity in the Sphere of Informatisation” and on Ratifiction of Tasks of the National Informatisation Programme For 2003-2005”, whose purpose is to improve government regulation in the sphere of information protection and fighting computer crime.

Prohibition of the importation, production, sale and distribution of child pornography in Ukraine is detailed in Article 301 of the Ukrainian criminal code. However, there is no prohibition of the possession of such material.

There is little legislation dealing with the liability of intermediaries in Ukraine. However, one case does suggest that the approach is basically similar to the EU, albeit without the same level of legislative underpinning. In 1998, a criminal case was launched against the owners of the company Relcom-Ukraine (at that time the largest Internet service provider) regarding material it hosted. Ultimately, all charges were dropped, as the company was able to show that it was not directly responsible for the material in

question and that in accordance with the contracts signed with its clients, it did not monitor information placed on its servers. There is no legal obligation on hosting providers to monitor content on their servers in Ukraine, unless a client has specifically asked it to do so and this is stipulated in the contract.

In August 2005, the Ukrainian Government introduced restrictions on unsolicited electronic communications, using Article 33 ("Responsibilities of users of telecommunications services") of the 2003 Law On Telecommunications as the legal basis. The rules include obligations for consumers to be able to "opt-out" of receiving messages, a prohibition of the falsification of network information, and obligations regarding the provision of a functioning e-mail address and the name of the sender.

Article 161 of the Criminal Code provides for sanctions in relation to the incitement of national, racial and religious intolerance, and the demeaning of national honour and religious beliefs.

Ukrainian legislation has been enhanced and brought into line with the TRIPS requirements by several laws amending Ukrainian Intellectual Property Laws.[13] However, most of the focus in Ukraine in relation to music and software piracy has been on offline infringements, due to the existence of large pirate CD plants in the country. Legislation was passed in May 2005 in order to close legal loopholes with regard to this activity. A wide range of further legislation was passed in this field in 2006, providing legal protection for computer programmes, broadcasting and cable retransmission, databases and resale rights. Enforcement measures were also adopted. The Ukrainian Ministry of Justice believes that 80 to 90 percent of legislation in almost all key IPR fields corresponds with the EU *acquis communautaire*.

On June 10, 2004, the Presidium of the Supreme Economic Court accepted the Resolution "On Certain Issues concerning the Solution of Disputes Related to Copyright and Intellectual Property Rights Protection," providing procedures for protection of intellectual property rights, particularly sales of computer software and programs.

The penalty for reproducing disks protected by copyright is a fine of up to twenty times value of the manufactured goods and not less than 5,000 times the current personal tax-free allowance levels.[14] The producer and the customer bear responsibility for correct completion of contracts and the use of copyright and/or related rights. The Civil and Criminal Codes have been updated on the basis of these rules, including custodial sentences of up to five years for breaching the law concerning optical disks.

Regulation in the area of information processing in Ukraine is covered by a number of laws, as highlighted above in the Overview section.

The State Committee on Communications Order of 17 June 2002 № 122 obliges access providers to install black-box systems for the interception of communications.

---

[13] Laws on Several Amendments to Intellectual Property Laws No. 34-IV of 4 July 4 2002 (devoted to the protection of the copyright on the Internet); No. 850-IV of May 22, 2003; N 1407-IV of February 2004; and No. 2734-IV of July 6, 2005 "On amendments to the several acts regarding the production and import of discs, recording equipment and raw materials"

[14] The amount of a tax exemption is the current minimum amount that can be earned free of income tax

There are no national laws on data retention.

3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS

3.1 Interconnection

With Ukrtelecom still a de facto state monopoly, the situation regarding interconnection is so heavily regulated that the cost of calls from fixed phones to mobile phones is decided by Government decree and the redistribution of incomes from such calls is based on agreements between Ukrtelecom and the mobile operators. This rate is currently 0.6UAH per minute (or approximately 0.10 Euro). These agreements between Ukrtelecom and mobile operators are signed on a yearly basis. At the present time, it is difficult to obtain data on interconnection between telephony operators because all sides have an interest in not revealing the actual conditions of their agreements. There is also no public information available regarding the existence of complaints regarding interconnection regulation.

Interconnection is governed by Chapter IX of the 2003 Law on Communications and the subsequent draft NCCR Order on Interconnection and Calculation among Operators.

The Law on Communications requires operators to provide other operators willing to conclude an interconnection agreement with the information required for negotiation and to offer interconnection terms that are at least equivalent to those proposed to other operators (Art. 58). The NCCR is authorised to intervene in cases of failure by parties to negotiate (paragraph 19, Art. 18).

For fixed-to-mobile interconnection, the termination fee is 0.25 UAH (0.04 Euro) per minute. The price of call termination in the mobile-to-fixed market is decided by commercial agreement between the parties, but the tariff cannot be more than 0.25 UAH (0.04 Euro).

Mobile to mobile interconnection is purely a matter for commercial negotiation.

Charges for call origination and other telecommunication services are subject to the control of the Antimonopoly Committee (AMC) of Ukraine in cases where the charges are deemed to have a significant social impact. For instance, on 28 October 2005 the AMC adopted a decision recommending mobile operators abolish sign-up charges for users. The fact that the number of mobile subscribers exceeds the number of fixed subscribers in Ukraine was the basis for the argument that this intervention was needed.

This issue of interconnection is being addressed by the NCCR as a matter of priority, in order to deal with non-transparency in the interconnection regime. According to Article 59 of the Law on Communications, the incumbent operator is required to publish an RIO annually in the official journal of the NCCR. The offer should include the current list of interconnection points, technical requirements and economic terms. However, Ukrtelecom has not yet published an RIO, as the Law on Communications requires it to, since the Rules on Interconnection have not been adopted yet by the NCCR. The NCCR is drafting the Rules of Interconnection and these are currently available for public discussion on the NCCR website.[15]

[15] http://www.nkrz.gov.ua/ua/docs/pravila_v3.zip (Ukrainian language only)

Until Ukrtelecom's monopolies are weakened (and a decision on this issue is expected in the near future), there is little possibility of the introduction of carrier selection and carrier preselection.

Running parallel to Ukrtelecom's monopoly are the illegal international voice services. As early as 2001, some estimates put the percentage of illegal international voice services in Ukraine as a percentage of total voice traffic as high as ten percent.[16] Such problems often indicate issues with regulation or competition in the marketplace. However, this situation is changing and there are now several private operators, such as Optima, that are in the process of developing their own infrastructure.

Ukrtelecom revenues from the different services on offer were as follows: Long distance calls revenue – 2,633.9 billion UAH (427.39 million Euro) or 49.86 percent of total revenue; local fixed calls revenue – 1,317 million UAH (213.71 million Euro) or 24.3 percent of total revenue; international call revenue – 950.7 million UAH (154.27 million Euro) or 18 percent of total revenue; IP – 156.417 million UAH (25.38 million Euro), or 2.96 percent of total revenue.[17] Other services such as paging made up the remainder.

No attempt has been made to calculate losses from the illegal termination of voice calls in Ukraine. Ukrtelecom offers a termination rate for IP calls of 0.75/0.77 US$ (0.62/0.63 Euro). It is not known how many (if any) IP telephony companies avail of this offer.

Ukraine's mobile sector is very dynamic. There are five mobile providers in the country: UMC[18] (GSM–900/1800 and NMT-450i), Kyivstar[19] GSM (GSM-900/1800), Golden Telecom[20] (GSM-1800), WellCOM[21] (GSM-900) and Astelit[22] (GSM-1800).

3.2 Numbering

The Department of Communications and Informatisation (part of the Ministry of Transport and Communications) develops and manages technical policy for numbering allocation. The NCCR provides a management function for numbering policy through liaison with operators. Under the 2003 Law on Communications, administration of numbering resources is divided between the "Central body of the executive government in the communications sphere," which is responsible for legislation and policy regarding numbering, and the NCCR, which is responsible for assessing requests for numbering resources and ensuring that the relevant rules on use of numbers are respected and has the power to withdraw numbers, if necessary.

[16] Zerkalo Nedely, quoted in Fibre Optic Telecommunications Networks Ukraine, 11 August, 2001, last accessed on 3 August 2005 at http://www.bisnis.doc.gov/bisnis/bisdoc/030214UkrFiberOptics.htm

[17] Data from Ukrtelekom

[18] http://www.umc.ua/ukr/splash.php

[19] http://www.kyivstar.net/site.php/en

[20] http://www.goldentele.com/

[21] http://www.beeline.ua/index_ru.wbp

[22] http://www.life.com.ua/index.php?lng=uk

Planning work is currently underway to overhaul both the fixed and mobile numbering resources used in Ukraine in order to take account of increased use of both networks.

The number allocation procedure is regulated by the Law on Communications.[23] According to Article 70, "*numbering resources are provided to [a] telecommunications operator*[24] *for the period of validity of its licence without the right to sub-allocate these numbers to other operators.*" The sub-allocation of numbers has been used in other countries to facilitate the use of geographic numbers for VoIP, an option that is therefore not available in Ukraine.

Nevertheless, telecommunications providers are able to exchange numbering resources amongst themselves, based on contractual agreements.

Before the development of independent private telecommunications operators, Ukrtelecom[25] had an exclusive right to telephone numbering resources. However, this situation is changing and now there are several private operators, such as Optima, that are in the process of developing their own infrastructure, and obtaining their own numbering resources directly through the NCCR.

Neither fixed nor mobile number portability is currently available, although all of the main mobile operators have expressed support for mobile portability to be implemented.

Non-geographic numbers, such as national local call or premium rate services, have not yet been developed in Ukraine.

In the near future the subscribers of mobile operators will be able port their number between operators if Bill N 2047 is successful. This bill aims to amend the list of obligatory services provided in the context of the Law on Telecommunications.[26] Whether or not consumers will be charged a fee to port their numbers is not yet clear.

3.3 Rights of Way and Facilities Sharing/Collocation

Every three years, the Parliament of Ukraine approves the activities proposed under the National Program for Informatisation, which includes infrastructure development decisions taken at national and local levels. The Report of the Parliament No. 3075-IV, adopted on 4 November 2005, concerning the approval of tasks of the National Program for Informatisation for 2006-2008, obliged the Cabinet of Ministers to provide an economic analysis of the financial resources needed for the planned projects, so that the costs to the state could be included in the State Budget.

[23] Adopted November, 2003. English translation http://www.ntca.org/ka/ka-3.cfm?content_item_id=2342&folder_id=495

[24] According to the Law on Communications, the telecommunications operator is a legal entity that has a right to operate in the telecommunications market and to provide technical services and operate a telecommunications network

[25] *Ukrtelekom* (http://www.ukrtelecom.ua) is the monopoly telecommunications operator controlled by the Ukrainian government (92.86 percent). Other stocks were distributed to a work collective in 2002. Ukrtelekom controls over 80 percent of the public network and serves over 9 million customers

[26] See http://www.mobile-ukraine.com/archives/251

The 2003 Law on Communications[27] offers the NCCR a variety of tools to ensure competitive neutrality with regard to building communications infrastructure. According to current legislation, all telecommunications operators have the right to build telecommunications networks in accordance with a Plan that has been approved by the Ministry of Transport and Communications (MTC).

The procedure for approving the Plan is the following:

- The telecommunications operator should develop a Plan for the building of the telecommunications network;
- The Plan should be sent to the MTC for review and approval;
- After the plan has been approved, the operator should ask the owner of the cable man-hole (Ukrtelecom or the local government) to approve the construction.

The procedure applies equally to all communications companies regardless of size. However, as the requirements are somewhat complex, there is a risk that only larger companies, with the resources to tackle these requirements, are in a position to build telecommunications networks cost effectively.

Once the procedure for approving the Plan has been completed, the telecommunications operator needs to secure building permission. The procedure for obtaining permission to build a network is set out in Article 10 of the Law on Telecommunications, and includes:

- Having the relevant communications licence;
- Obtaining permission for land use;
- Obtaining permission from the local authority to build the network (based on the decisions approved by the local communications, architecture, and health authorities).

Often, rather than rolling out their own networks, telecommunications operators and providers use the networks built by local community companies, particularly TV providers, which also provide low cost Internet services.

3.4 Tariff Policy

Article 67 of the 2003 Law on Communication sets clear rules regarding the cost orientation of services, meaning that the legal basis for bringing about a competitive market in the local call and international markets is in place. The Law states that:

"*Tariff regulation on the telecommunication market of Ukraine shall be based on the following principles:*

- *Tariffs shall be based on the cost of these services and considering the profit earned;*

[27] A translation of which can be downloaded from http://gipi.internews.ua/eng/GIPI_activity/Telecom/Law%20on%20Telecommunications_eng.doc

- *Tariffs shall depend on the quality of telecommunication[s] services;*
- *Telecommunication[s] operators/providers shall not set dumping or discriminatory prices;*
- *Cross funding of one telecommunication service [to the benefit] of another shall be avoided*."

NCCR has drafted extensive rebalancing measures, with a 70 percent reduction in the cost of international calls and an increase in local rates. Line rental is set to increase by between 200 and 300 percent (up to 18UAH/3 Euro to 28UAH/4.5 Euro). International tariffs are being reduced by between 17 and 69 percent, while national long-distance calls are being reduced by between 13 and 17 percent.[28]

Despite these price adjustments, tariff rebalancing *per se* has not been implemented in Ukraine. The incumbent telecommunications operator (Ukrtelecom) fulfils its universal service obligations through its low fixed prices (prices for local and regional calls are below cost for Ukrtelecom subscribers) and the development of its fixed network to cover the entire territory of the country. The profit from international calls covers losses from local and regional calls and ensures the company's viability.

Mobile operators' prices are not regulated, as the market is deemed to be competitive.

3.5 Cost Accounting

In the absence of liberalisation and requirements for cost-based access to the monopoly provider's network, there is little need for an efficient cost accounting system at present, as Ukrtelecom calculates all costs.

However, as mentioned above, the 2003 Law on Communications does require services to be based on cost orientation in order to ensure the possibility of fair competition in the market. Therefore, the NCCR will need to develop some form of consistent methodology to ensure that this aspect of the law is respected. However, nothing has yet been published at the time of writing.

3.6 Universal Service

By "universal" services the Law on Communications understands "a minimum set of services of standardised quality determined by the Law, accessible by all the consumers on the whole territory of Ukraine" (Article 1). The exhaustive list of the universal services in Ukraine comprises: "landline telephone (local, long-distance and international) communication services, (except for services provided using wireless access facilities), including emergency call services, information services, communications that use payphones and trunk-call offices, facsimile and telegraph communication" (Article 62).

[28] See http://www.ura-inform.com/ru/economics/2006/04/27/Ukrtelekom for more information

According to the Law on Communications, specific services should be available for all consumers living on Ukrainian territory. These universal services include fixed telephone connection for local, long distance and international calls, emergency and directory services, payphone services, and facsimile and telegraph services.

The approach with regard to universal service is based on the Concept for a Universal Services Fund, which is outlined in the draft Report (No. 8448 of 14 November 2005) of the Parliament on the Approval of the Recommendations of the Parliament Hearings on Information Society Development in Ukraine held on 21 September 2005 and the Concept on Telecommunications Development. According to the Law on Telecommunications (Article 64), the development of universal services should be outlined in the Concept on Telecommunications Development, subject to approval by the Cabinet of Ministers. The latest version of the draft Concept on Telecommunications Development, dated 1 August 2005, was prepared by the Ukrainian Research and Scientific Institute of Communications and submitted to the Cabinet of Ministers. The approval process was disrupted by preparations for Parliamentary elections in Spring 2006.

Universal service is based on tariffs fixed by the Government. While the legal basis for universal service is clear, the implementation of this legislation has not been prioritised to date. A universal service fund has not yet been established and the methodology for funding any such initiative has not yet been developed. It is worth noting that mobile operators are already subject to a levy on their income to contribute to the national pension fund.

The Ukrainian authorities are addressing universal service in a pragmatic way, not dissimilar to the approach taken in Russian legislation. They are taking measures to ensure at least communal access to communications networks, providing a basic level of access to citizens before building up to more comprehensive universal service measures. Pilot projects have been launched, the experience from which should form the basis of future work in this area.

In addition, plans were announced to provide low-cost access to the Internet in the major cities of Ukraine using WiMAX technology. Three national and two regional 5.74Ghz-5.67Ghz licences are in the process of being auctioned.

Directory services and access to emergency services (fire, police and ambulance) are only available for fixed network users. Mobile networks are not connected to emergency call centres. Universal services for disadvantaged users are not yet included in Ukrainian law.

The right to receive an invoice for telephony services was introduced by the 2003 Law on Communications.

Tariffs for universal services are to be regulated by means of introducing either maximum or fixed rates (according to Article 66(2)(1) of the Law on Telecommunications). Under legislation in force since 1 January 2005, the NCCR has had the right to impose the obligation on companies with nationwide monopoly status, and on companies looking to develop services to consumers in regions needing universal service support, to develop and provide universal services to consumers. The

mechanism for the compensation of losses incurred as a result of fulfilling this obligation is to be determined by the Cabinet of Ministers of Ukraine (Article 64(5)).[29]

3.7 Local Loop Unbundling

At present, there appears to be little likelihood that local loop unbundling will be mandated by the Ukrainian central government, as there are other priorities which are considered more urgent.

3.8 Leased Lines

Official statistics regarding the use and availability of leased lines in Ukraine are not currently available, as these data are not collected from market players by state authorities.

Alternative telecommunications providers are dependent on leased lines as Ukrtelecom owns the majority of the infrastructure and many alternative providers do not have sufficient resources to build their own networks and consequently have to rely on Ukrtelecom's network. This is particularly true for the lower-cost end of the market.

Private operators usually develop their own networks for business customers and they are not generally interested in the less lucrative residential market because of the high cost of building communications channels. According to data from operators in Kyiv, installation costs can range from 420 Euro in areas with above average (by Ukrainian standards) infrastructure to 2,500 Euro in more underdeveloped regions. Individuals or smaller businesses obviously cannot pay for such services at these rates.

At present, only cable television distributors provide the opportunity for smaller entities to have a comparatively fast, always-on connection to the Internet. Such a connection costs approximately 25 US$ (20.6 Euro) per month. This comparatively low price is due to the fact that this service can be provided with relatively low levels of additional investment by the cable ISPs.

Local experts report that, "*99 percent of providers rent [leased lines] from Ukrtelecom, and only some carry their own lines. However, a customer will feel the difference, if he/she tries the channels of different providers. Carrying capacity, external channel quality, the "last mile" (meaning quality of a cable laid to the customer), as well as technology for signal transmission in the cable and the equipment used all have an impact on the Internet quality. The qualifications of the provider's personnel also play a big role*."[30]

[29] http://www.law.kuleuven.ac.be/icri/publications/564Article%20in%20World%20Internet%20Law%20Report-April%202004.doc?where=&temp=e43ec399ff1327ebaf063b9d50bc4fd6

[30] Herman Bohapov, "Internet Services Market – the First Step is Made", 12 December 2003 http://www.e-ukraine.org/e-ukraine/section2.jsp?item_id=127179&category_id=38352

One supplier of services to mobile phone operators in Ukraine told the study team that difficulties (cost, in particular) of using leased lines in Ukraine have resulted in other options being sought, such as wireless backhaul services which, while expensive to install, are an attractive option when long-run costs are taken into account.

The following table illustrates the monthly rental for intercity connection (the link within each city is not included in these prices).[31]

Monthly Line Rental for Intercity Connectivity

Direction	64K, UAH/Euro	2Mb, UAH/Euro
Kyiv-Odessa	3,888 / 630.90	27,994 / 4,542.5
Kyiv -Lviv	3,888 / 630.90	27,994 / 4,542.5
Kyiv -Lugansk	5,599 / 908.54	40,311 / 6541
Kyiv -Mariupol	5,599/ 908.54	40,311 / 6541
Kyiv -Simferopol	5,599 / 908.54	40,311 / 6541
Kyiv -Yzhgorod	5,599 / 908.54	40,311 / 6541

Interconnection with the public switched network is subject to state regulation governed by the Order of the State Telecommunication Committee of 7 June 2002, No. 120. The price for the provision of a connecting line is 333.33 UAH (54.09 Euro) per month.

Prices for long distance and international calls of local operators made via Ukrtelecom lines are regulated by the Order of the Ministry of Communications of 21 November 1996, No. 234, on the basis of revenue sharing. This depends on the number of lines, equipment used, and administrative costs.

In Ukraine, DSL is used by Internet Service Providers as high speed leased lines. HDSL is the most widespread technology used for this purpose, reaching 2Mbps data exchange speeds in both directions.

A new company in the Ukrainian market, Datagroup, is building out a 1,800km fibre optic network, which it will use as the basis to provide wholesale services to other communications operators and ISPs, taking advantage of Ukrtelecom's problems in dealing with current demand. Eurotranstelecomm has also recently joined the wholesale market. This new level of competition has lead to significant price reductions, by up to 90 percent in some cases (not reflected in the table above). Datagroup and Ukrtelecom deny suggestions that prices are now below cost.

[31] http://ipages.com.ua/articles/?id=42

3.9 Mobile Services

There are two major mobile providers on the Ukrainian market, UMC[32] (Ukrainian Mobile Connection) and Kyivstar.[33] In addition, there are three very small mobile providers (Golden Telecom,[34] Digital Cellular Communication of Ukraine[35] and Ukrainian Mobile Systems[36]). There is one virtual mobile network operator Privat:Mobil (using UMC's network on GSM900), which was launched in 2005.

Russia's Vimpelcom announced on 11 November 2005 that it had bought the mobile operator Ukrainian Radiosystems (URS) for 231.3 US$ million (191.16 million Euro). The subscriber base of URS amounted to 51,200 people at the end of 2005, or less than 1 percent of mobile users in Ukraine.[37] URS has a GSM900 licence that covers the entire territory of Ukraine, which has a population of approximately 47.8 million. URS also has a GSM 1800 licence that covers 23 of Ukraine's 27 administrative regions (excluding the city of Kyiv and the Kyiv, Dnipropetrovsk, and Odessa regions). Ukrainian radiosystems (URS) provides services in GSM-900 under the brand names WellCom and Moby.

The NCCR has decided to limit the number of licences available to new subscribers for the CDMA standard in the 800 waveband. There are four companies in Ukraine operating in the CDMA standard: ITC,[38] CST-invest,[39] Velton Telecom[40] and Intertelecom.[41] All of these operators are working in CDMA-20001x and they offer, in addition to telephone services, a full range of digital telephone communication services and fast data transmission.[42] According to the CDMA Association,[43] the total subscriber base for CDMA rose by 43 percent in the year to June 2005.[44]

Mobile users of Astelit's network (marketed under the trademark "life:)")[45] will have the opportunity to be the first in Ukraine to experience 3G services. An EDGE service offering connection speeds of 236kbps is already on the market. Such offerings will also help life:) to better understand user expectations for high-end services. For life:), EDGE is a transitional migration step to 3G.[46]

According to life:)'s strategy, EDGE based services will be available in the largest cities, in areas of heavy data usage and in city centres. EDGE was made available in Kyiv, Odesa and Dnipropetrovs'k on 25 March 2005. life:) intends to continue its expansion of

[32] http://www.umc.ua/eng/splash.php

[33] http://www.kyivstar.net/site.php/en

[34] http://www.goldentele.com

[35] http://www.dcc-ua.com/

[36] http://www.wellcom.ua/

[37] http://www.mobilecomms-technology.com/projects/vimpelcom/ (last visited 6 December 2006)

[38] http://www.cdmaua.net/english/index.shtml

[39] http://www.cst-invest.dp.ua/

[40] http://www.velton.ua/

[41] http://www.intertelecom.ua/

[42] Telecommunication of Ukraine, N23, 2005

[43] http://cdma.net.ua/

[44] See Telegeography Commsupdate, Ukrainian CDMA Operators Expand to New Regions", 3 January, 2006

[45] http://www.life.com.ua

[46] http://www.mforum.ru/news/article/010931.htm - last visited 20 January 2006

EDGE coverage in Ukraine. UMC recently awarded a tender to the Kyiv company Priocom[47] to develop its IP/MPLS infrastructure to boost its capacities for GPRS, EDGE, advanced IP services and in preparation for the launch of 3G services.

A range of 2.5G and 2G data services are also available on the market. However, prices are somewhat prohibitive bearing in mind the income levels in the country (WAP per minute 0.30UAH or 0.04Euro; GPRS per megabyte 5UAH or 0.81Eur at peak times, and 1UAH (0.16 Euro) off peak).[48] No statistics regarding the take-up of such services are available.

As an indication of the extent of mobile coverage, Kyivstar claims a territorial coverage of 97 percent, with a population coverage of 98 percent.[49]

Mobile phone penetration is growing at a precipitous rate in Ukraine, increasing from 42.48 percent (based on industry figures) at the end of 2004, to 64 percent[50] at the beginning of 2006, and rose to 84.9% by 30 September 2006.[51]

The standard methodology for calculating subscriber numbers in Ukraine is to count contract customers together with prepaid customers who have had at least one piece of incoming or outgoing traffic on their phone in the preceding three or six months (depending on the operator).

There are no published overall figures on the number of pre-paid customers. However, an indication can be garnered from the following: according to the third quarter 2005 financial report of Mobile Telesystems OSJC (owner of UMC), 89 percent of UMC's customers were on prepaid tariff plans.[52] Moreover, a small increase in the proportion of prepaid subscribers was recorded in five consecutive quarters: from 82 percent in Q3 2004 to 88 percent in Q3 2005.[53]

To illustrate the cost of mobile services in Ukraine, a customer of UMC[54] will pay 0.30UAH (0.05 Euro) for an SMS message, while a three-minute call to another mobile operator is 1.77 UAH (0.28 Euro).

Data regarding the level of SMS use by Ukrainian consumers is illustrated on the example of Kievstar mobile operator:

Index	1st Quarter 2005	2nd Quarter 2005	1st Quarter 2006	2nd Quarter 2006
Average number of SMS messages sent per month by mobile subscribers[55]	23	16	22	21

[47] http://www.priocom.com/en/

[48] Prices from http://www.kyivstar.net as at 10 October 2005

[49] http://www.kyivstar.net/coverage/

[50] http://www.mcapital.com.ua/onenews.php?id=40223, last visited 9 February 2006

[51] http://www.cellular-news.com/story/19810.php

[52] Financial Results for the Second Quarter Ended 30 June 2005

[53] MTSS, Third Quarter Financial and Operating Results, Management Presentation, November 23, 2005

[54] There is a wide range of contract offers available; this example is based on the standard package.

[55] http://market.mabila.ua/news/2006/09/28/5200.html

Fixed line monthly rental (Ukrtelecom), is 17.02 UAH (2.76 Euro) in urban areas and 10.92 UAH (1.77 Euro) in rural areas; for metered local phone calls the price is 11.90 UAH (1.93 Euro) in urban areas and 9.55 UAH (1.54 Euro) in the rural areas. There is not usually any monthly fee for mobile services.[56]

UMC on the 1st September 2006:[57]

Tariffs	"SIM-SIM Minimum"	"UMC Minimum"
The cost of package, UAH.	25 UAH (4 Euro). (balance 10 UAH (1.62 Euro))	5 UAH (0.8 Euro))/ monthly
Calls to UMC, Sim-Sim, Jeans	0.50 UAH (0.08 Euro)	0.50 UAH (0.08 Euro)
Calls to other mobile operators within Ukraine		
Calls to fixed land lines within Ukraine		
Calls to UMC Family	0.10 UAH (0.02 Euro)	0.10 UAH (0.02 Euro)
Connection fee	0.27 UAH (0.04 Euro)	0.27 UAH (0.04 Euro)
SMS	0.30 UAH (0.05 Euro)	0.30 UAH (0.05 Euro)

Just as in the EU, where mobile operators are seeking to maximise falling or stagnant ARPU figures, there are indications that ARPU is beginning to level off in Ukraine, as can be seen in MTS's[58] figures[59] below:

	Q2 2006	Q1 2006	Q4 2005	Q3 2005	Q2 2005	Q1 2005
MTS	$15.11/ 12.48 Euro	$14.46/ 11.95 Euro	$13.33/ 11.01 Euro	$10.94/ 9.04 Euro	$9.52/ 7.87 Euro	$8.08 6.68 Euro

Pension Fund Levy

A levy of 7.5 percent on subscriber revenues is charged by the Ukrainian government to supplement the national pension fund. This was increased from 6 percent in August 2005.

Mobile Market Overview

Operator	Technology	Subscribers (in millions)	Ownership

[56] http://www.ukrtelecom.ua/ua/tariff/additional/telephone/local_private/

[57] http://market.mabila.ua/news/2006/09/28/5200.html - tariffs in force until 31 December 2006

[58] MTSS, Third Quarter Financial and Operating Results, Management Presentation, November 23, 2005

[59] http://www.rustocks.com/put.phtml/mtss_2q2006_gaap.pdf

Kyivstar	GSM	17.2	Telenor (56.52%), Alfa Group (43.48%)
Ukrainian Mobile Communications	GSM, NMT	15.9	MTS (100%)
Astelit life:)	GSM	4.7	Turkcell (54.2%), SCM Holdings (45.8%)
WellCom	GSM	0.78	VimpelCom (100%)
DCC	TDMA	0.07	Turkcell (54.2%), SCM Holdings (45.8%)
Golden Telecom	GSM	0.05	Golden Telecom (GLDN)
CDMA operators	CDMA	0.135	ITC Ukraine, Velton, etc.

In September 2006, Kyivstar accounted for 43.8 percent of the total mobile subscriber base, UMC accounted for 40.5 percent and Astelit and URS accounted for 12.7 percent and 2.3 percent respectively.

At the same date, Kyivstar and UMC accounted for 31.8 percent and 27.4 percent of the increase in Ukraine's total mobile subscriber base respectively, while Astelit accounted for 29.6 percent and URS for 9.9 percent.[60]

In July 2006, UMC received a licence to provide communication services in the CDMA 450 standard. UMC will provide services including wireless virtual data transmission networks, remote access to corporate e-mail, high-speed Internet access, and multimedia services (video on demand). The company is planning to offer the services both to individuals and corporate subscribers.[61] It already had a CDMA-450 non-voice licence. As the Russian CDMA operator Sky Link and the UMC parent company MTS are both affiliates of the Russian holding company AFK Sistema, there is speculation that UMC's CDMA activities are paving the way for an expansion of Sky Link's activities into the Ukrainian market. In addition, UMC was granted a licence for GSM-1800 services in eight Ukrainian regions by the NCCR, and was granted additional frequency resources in seven further regions up until December 2013. The new resources will be used from May of 2007.

Telesystem of Ukraine, an existing CDMA operator, is planning to launch a mobile CDMA2000 1x service before the end of 2006. According to the General Director of the company, the service will initially cover cities of more than one million inhabitants, before rolling out nationwide within two to three years. The company is the only one with a licence for mobile CDMA, giving it a strong advantage in the 3G marketplace.[62]

[60] http://www.cellular-news.com/story/19810.php

[61] http://umc.ua/eng/press_release.php?news_id=1320

[62] http://itware.com.ua/news/13450/

As stated on page 21 above, Ukraine has not yet launched 3G/UMTS services and only one licence has been awarded (to the telecommunications incumbent Ukrtelecom). Ukrtelecom has announced plans to invest 700m US$ (578 million Euro) in 3G/UMTS over the next 5 years, with network equipment being supplied by Nokia. Six vendors have made offers to the NCCR to build a trial 3G/UMTS network using the 2GHz range. The NCCR is expected to launch three further 3G/UMTS licences in early 2007.[63]

Kyivstar Profits[64]

	6 MONTHS 2006		6 MONTHS 2005	
Net profit *(US$/Euro) (thousands))*	243,901 / 201571		10, 590 / 8,752	
ARPU US$/Euro	Q1 2006	Q2 2006	Q1 2005	Q2 2005
total	$ 7.9 / EUR 6.5	$ 8.6 / EUR 7.11	$ 8.9 / EUR 7.36	$ 9.7 / EUR 8.02
Contract users	$ 26.2 / EUR 21.7	$ 28.7 / EUR 23.72	$ 26.5 / EUR 21.9	$ 29.4 / EUR 24.30
Pre-paid users	$ 6.4 / EUR 5.29	$ 7.1 / EUR 5.87	$ 6.8 / EUR 5.62	$ 7.6 / EUR 6.28

3.10 Satellite Services

There are a number of companies providing Internet access via satellite technologies in Ukraine. These include Ukrsat,[65] Infocom-SK,[66] Spacegate,[67] Adamant,[68] LuckyNet,[69] Ukrnet,[70] and Itelsat.[71] Excluding Infocom-SK, these are all private operators (several of these companies are resellers). Ukrchastotnagliad, the Ukrainian frequencies supervisory centre, reports that 86 operators have licences to provide satellite communications services in Ukraine. Despite the large number of operators on the market, however, satellite telecommunications in Ukraine may be limited due to low-income levels. The Government is nevertheless deploying a digital satellite television and radio broadcasting system, which will also be used for Internet services.

Ukraine has joined the Inmarsat, Intelsat, Global Star, Thuraya and Orbcomm satellite networks.

Currently, there are five licences for direct satellite communications services.

In Ukraine, access to satellite communication is divided into reception and transmission of information. The reception of information by satellite is available to anyone, without

[63] http://www.umts-forum.org/servlet/dycon/ztumts/umts/Live/en/umts/News_PR_Article120706

[64] http://market.mabila.ua/news/2006/09/28/5200.html

[65] http://www.ukrsat.net/

[66] http://www.ukrpack.net/

[67] http://www.spacegate.com.ua/

[68] http://www.adamant.net/

[69] http://www.lucky.net/

[70] http://www.gu.net/

[71] http://www.itelsat.com.ua/

the requirement for a licence or permission for use of radio frequency. The necessary receiving equipment is available to anyone willing to invest in it.

For the transmission of information (for example, the use of an Internet access service), it is necessary to have permission to use the frequency, which acts as a brake on the development of this market sector. Furthermore, satellite communications equipment is subject to certification, which takes around half a year to process by the authorities. This market is not considered promising for those providing services to the private or small business user, since data link bandwidth is limited and Internet Service Providers that use this method cannot compete in terms of price or speed.

The narrowness of the market is explained by the fact that full uplink and downlink services via satellite communications are comparatively expensive for the end user, because users have the option of purchasing Internet access services at significantly lower prices from cable operators. For this reason, satellite communications services are generally targeted at large corporate clients.

The Ukrainian Research and Academic Network (URAN)[72] connects 90 universities and research institutions. The main operators of the network are the European Integration Centre Ltd and public enterprise, UARNet.[73] The network includes access points in 16 oblast (regional) centres and uses Ukrtelecom leased lines with data rates of 64kbits/s to 8Mbits/s.

3.11 Status of the National Regulatory Authority (NRA)

The National Committee for Communications Regulation (NCCR) was set up in April 2005 as the independent national communications regulatory authority of Ukraine. As it is not possible under the Ukrainian legal system to have an executive body that operates completely outside Government, the NCCR functions under the authority of the President of Ukraine, thereby, in principle, ensuring its independence from Government.

After some uncertainty regarding the sources of funding for the NCCR up until the end of 2005, a budget of 23.1 million UAH was allocated for regulatory activities for 2006, with a further 2.6 million UAH allocated specifically for the management of the reorganisation of spectrum (see the section on spectrum below). As the NCCR has not been in operation for very long, it is difficult to say with certainty whether it has, or will have, sufficient funds to carry out its assigned tasks.

The key tasks of the NCCR[74] are to:

- introduce proposals to governmental bodies regarding legislation, other normative legal acts and standards in the sphere of telecommunications;
- develop and approve Regulations and other normative legal acts within the limits of its authority and oversee their implementation;
- supervise the telecommunications market;

[72] http://uran.net.ua

[73] http://www.uar.net/

[74] This list is a translation of parts of Article 18 of the Law on Telecommunications.

- issue licences and registrations in the scope of telecommunications services;
- distribute, assign and keep records of number resources, issue and cancel permits to use numbering resources, and manage the use of number resources;
- oversee the quality of telecommunications services and satisfy users' demands;
- regulate telecommunications tariffs and settle disputes among telecommunications operators, as appropriate;
- issue permits to telecommunications operators and providers to set specific tariffs for disabled and socially disadvantaged persons for public telecommunications services;
- support the legal provision of public telecommunications services;
- obtain statistical reports from telecommunications providers and operators as established by legislation;
- obtain documents, statistics and other data, as established by legislation, from central and local executive Governments, the executive Government of the Autonomous Republic of Crimea, and local Governments;
- adopt decisions within the limits of its authority, which must be adhered to by providers/users of the telecommunications market;
- apply administrative penalties to providers/users of a telecommunications market in a manner described by legislation;
- submit materials to the Anti-Monopoly Committee of Ukraine in cases of violation of the legislation on the protection of competition;
- take legal action following complaints regarding violations of telecommunications legislation by business entities who operate in the telecommunications sector;
- regulate the interaction of operators when telecommunications networks interconnect;
- create favourable organisational and business conditions for attracting investment in telecommunications;
- ensure equal terms and conditions for all market players;
- ensure dispute settlement among telecommunications operators and providers with interconnected telecommunications networks;
- keep a register of telecommunications operators and providers;
- cooperate with corresponding regulatory bodies in other countries;
- publish an official bulletin, which includes normative legal acts, news and other information; and
- fulfil other responsibilities, envisaged by the Law on Communications, other laws, and normative-legal acts.

There does not appear to be any overlap between the administration of telecommunications by the Government and that of the NCCR. Again, it is difficult to tell at this early stage if there will be any practical issues regarding the division of labour between the Ministry and the NCCR, or the speed with which they will be addressed should they arise.

The study team is not aware of any staff from the telecommunications incumbent being seconded to work for the NCCR, although (somewhat inevitably and not necessarily causing a problem for the independence of the commission) there are former incumbent staff working at the top levels of the NCCR.

Until the NCCR has been in operation for more time and has dealt with significant consultations or disputes, it is difficult and possibly misleading to speculate on its likely effectiveness.

3.11.1 Cable Regulation

Despite the extensive powers of the NCCR, the regulation of cable communications has not been put squarely and unequivocally into its remit.

Ukraine has an extensive cable television network (when compared with other CIS countries). However, the further development of cable television has been hampered by a lack of relevant legislation, meaning licensing and overall management of the industry is very complex. Based on current legislation, the Ukrainian cable television industry is administered by several government entities. The division of authority and responsibilities is a nebulous issue not only for foreign investors but also for industry specialists. There are at least four government agencies that exercise direct control over the industry:

- The Department for Communications of the Ministry of Transportation (the former State Committee for Communications);
- The National Council for Television and Radio Broadcasting;
- The Ukrainian Centre for Control of Radio Spectrum;
- The National Commission for Communication Regulation;

Ambiguous and outdated legislation leads to confusion and conflict; for instance, cable television services are currently licensed by the National Council for Television and Radio Broadcasting, although the latest legislation delegates this authority to the NCCR. However, because the NCCR has not yet taken over all of its responsibilities, its functions are supposed to be performed by the Department for Communications of the Ministry of Transportation. Numerous court hearings, decisions and counter decisions do not make the situation better.

Moreover, the Antimonopoly Committee of Ukraine views cable television operators as natural monopolists, and delegates regulatory authority over their industry tariffs to local administrations. Average monthly tariffs established by city authorities vary from 0.85 Euro to 5 Euro. Based on the above user fees, cable television companies say that they cannot afford to produce their own programming as well as pay television companies for the programmes they distribute. Operators can also offer individual packages that could include more channels or other value-added services (Internet, security, etc.). In these cases the fee is not limited.

3.12 Licensing and Authorisation

The procedure for the licensing of telecommunications services is regulated by the 2003 Law On Telecommunications, as well as by additional guidelines issued by the NCCR. The Law specifies that local, inter-city and international telecommunications services, as well as mobile telephone communications and television and radio broadcasting, must be licensed. Under the Law On Telecommunications, the basic principles for the licensing of telecommunications service provision are as follows: creating open market conditions; acting in the best interests of society and service providers; equal access; efficient use of resources; promotion of new technologies; and the attraction of

investment. The NCCR is responsible for establishing the terms and conditions of licences and ensuring compliance.

Licensing for fixed telephone communications costs as follows:

- International (covering the whole territory) – 1,700,000US$ (1,404,958 Euro)
- Intercity - 68,000US$ (56,200 Euro)
- Domestic:
    - With network capacity of up to one thousand telephone numbers – 320 US$ (264 Euro)
    - With network capacity of up to ten thousand telephone numbers – 1,600 US$ (1,322 Euro)
    - With network capacity above ten thousand telephone numbers – 9,600 US$ (7,934 Euro)
    - With use of wireless access – 19,600 US$ (16,198 Euro)
    - With use of wireless access based on DECT technology -1,000 US$ (826 Euro)
    - In rural areas – 730 US$ (603 Euro)
    - Audio-text – 700 US$ (579 Euro)

A licence for mobile telephone service provision varies in accordance with the frequency involved and the size of the region in question. Prices range from 170,000 UAH (27,500 Euro) for the cheapest region in the 300-470 MHz band to 340,000 UAH (55,171 Euro) for Kyiv in the 1.7-2.2GHz band.

On 16 May 2001 the Ukrainian Government introduced licensing of VoIP with 15-year operational licenses at a cost of up to 899,300 UAH (146,000 Euro).

The term of the licence (except for VoIP, which is as described above) is determined by the NCCR and cannot be less than five years. For each type of telecommunications service, the NCCR is obliged to issue special instructions on the technical and bureaucratic parameters the enterprise should respect and what documents would be needed to confirm that the parameters have been met.

The CDMA operators have asked the NCCR to issue them with a licence for national roaming. Victor Frolov, the director of the executive committee of the CDMA Association of Ukraine, says that CDMA is available in 11 regions of Ukraine and the operators are ready to work together.

When compared with the previous situation, the 2003 legislation on licensing has greatly improved certainty for operators, as it is now impossible for the NCCR not to respond (actively or passively) within the time period specified in the law (one month) to licence applications. This replaces the system where businesses had to wait indefinite periods to get responses from official bodies.

In April 2006, the NCCR decided not to grant further GSM-900 and GSM-1800 licences, meaning that Golden Telecom will not be able to operate in the Kharkov, Lvov and Dnipropetrovs'k regions, although Astelit, Kyivstar and UMC do have licences to provide services there. A range of licences were awarded to URS, Kyivstar, Astelit and UMC for GSM-1800 services in a number of regions.

Market players in the telecoms sectors are divided by the Law on Communications into "operators" and "providers". Under Article 1 of the Law, "providers" do not have the right to maintain or operate networks. Operators are divided into mobile operators, fixed operators and fixed wireless operators. Mobile operators need to obtain a licence for the activity of provision of phone services and for the frequencies they use, fixed operators must have a licence for local, national and international services and fixed wireless providers need the same licences as fixed operators as well as a frequency licence.

The legal status of VoIP providers has so far been neglected. Within the context of the current definitions, they could be judged to be "operators" and therefore be liable to the same licensing procedures as the categories of operators listed above. This obviously creates a degree of uncertainty in the market.[75]

3.13 Spectrum

Radio spectrum is managed in Ukraine by the Ukrainian State Centre for Radio Frequencies (also referred to as "Ukrchastotnaglyad"),[76] under the authority of the State Committee on Communications and Information. The overall management of spectrum in Ukraine is in a state of flux, however. In due course, a body called the State Telecommunications Inspection (STI) will be established, under the supervision of the NCCR, to oversee spectrum management. Until this happens, the State Centre for Radio Frequencies will continue in its present role.

Radio spectrum is managed in line with the Radio Regulation annexes to the Convention of the International Telecommunication Union, which was ratified by the Ukrainian Parliament in 1994, as well as through some national regulations such as the Radio Frequency Resource Act of 2000.

Frequencies are licensed in compliance with the 7 February 2001 Cabinet of Ministers resolution number 112 on the Procedure for Issuing Licences for the Use of Frequency Resources in Ukraine.

According to Article 20 of the 2004 Law On Radio Frequency Resources of Ukraine, the National Frequency Distribution Table (NFDT) governs the distribution of radio frequency for general (regular) and special usage.

The list of special subscribers of radio frequency resources in Ukraine consist of:

- Departments and organisations in the Ministry of Internal Affairs;
- The Ministry for Emergency Situations and the Chernobyl disaster;
- The State Administration for Border Control;
- The Administration for State Security;
- The State Department for Corrections; and
- The Ministry of Transport of Ukraine, for the use of radio electronics by joint civilian and military management systems for flight traffic and flight support.

[75] http://www.law.kuleuven.ac.be/icri/publications/564Article%20in%20World%20Internet%20Law%20Report-April%202004.doc?where=&temp=e43ec399ff1327ebaf063b9d50bc4fd6

[76] http://www.ucrf.gov.ua/en/

Non-state subscribers of radio frequency resources in Ukraine are divided into the following groups:

- Commercial entities that are using radio frequency resources in order to provide telecommunications services, except for the purpose of television broadcasting;
- Commercial entities which are broadcasting television programmes by using their own or rented radio electronics means; and
- Technology and amateur radio users (private individuals and registered businesses, which are using Ukrainian radio frequency resources without providing telecommunications services).

The NFDT currently in force, which was adopted by the Cabinet of Ministers on 12 October 1995 (order no. 803), distributes frequency as follows:

- 0.4 percent - for civil usage;
- 27 percent - for military usage;
- 72.6 percent - for joint military and civil usage (in practice – for military usage).

According to the Ministry of Transportation and Telecommunications' press-release of 22 November 2005,[77] the Cabinet of Ministers approved the decision for the usage of 76 percent of previously military radio spectrum for the provision of 3G services by civil operators. Additional 3G licences will be sold by the NCCR to private operators on a competitive basis, although these may not be issued for some time.

Currently there are commercial Wi-Fi networks that provide services to the public. Technologies using standards IEEE 802.11a and IEEE802.11b are being used in Ukraine, according to the licences issued by the State Communications Committee of Ukraine, and permissions are granted by the "Ukrchastotnagliad" (Ukrainian Frequencies Supervisory Body). Equipment needs to be certified in compliance with Ukrainian legislation. Each piece of equipment is subject to technical evaluation, in accordance with the 5 October 2000 Order 154 of the State Communications Committee. Ukraine is not planning allow use low-power devices for Wi-Fi technologies without licences and corresponding permits.

Ukraine has not allocated and is not planning to allocate radio frequencies for the unlicensed use of Wi-Fi or similar technologies. Today Wi-Fi networks, operating in the 2400-2483,5 MHz frequency, are used in Ukraine to provide the public with wireless access to the Internet. More than 200 Wi-Fi licenses have been issued in recent years and all oblast regions have now exhausted their resources in the 2400-2483.5 range.

The 3400-3700 MHz frequency range is used by Ukrtelecom and RRT Consortium for radio relay.

[77] http://www.mintrans.gov.ua/mintrans/control/uk/publish/article?art_id=44028

4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES

4.1 Digital Signatures

Electronic signatures in Ukraine are governed by the Law on the Electronic Digital Signature and the Law on the Electronic Document (both from 2003). However, up until mid-2005, these laws proved generally ineffective due, inter alia, to the fact that the certification of e-signature verification centres, which is required by these laws, was so complex that it was impossible for businesses to be accredited. In addition, the certification of such centres was delegated to the Security Service of Ukraine (SBU).

On 1 July 2005, the central National Electronic Digital Signature certification body was established. Ukraine is the first among the countries of the CIS to introduce a central certification body. This carries out accreditation of key certification centres. Commercial and State certification centres can now provide electronic digital signature services for citizens, the state, private establishments and enterprises. Within the first six months of the new body coming into operation, ten centres had applied to be accredited, with the Ukrainian National Information Centre being the first body to be officially accredited.

It is hoped that electronic digital signatures will allow citizens to save time when dealing with state authorities, and allow the state authorities to provide services more efficiently. E-signatures from government bodies are offered as an option for signing official documents: citizens can choose whether to receive a digital signature with the help of the Internet or to use traditional signatures. The roll-out of digital signatures by state authorities is still at a very early stage.

4.2 Payment Systems

Electronic commerce is still undeveloped in Ukraine, partly due to the lack of adequate electronic payment systems.

However, the population does show signs of moving away from a cash-dominated society. At the beginning of 2006, the number of credit cards issued totalled 12,196,527 Mastercard credit cards and 18,243,259 Visa credit cards.[78] The annual turnover on Visa cards was $10,8 bn (8.9 bn Euro), twice as much as in 2005.[79]

Maestro card payments in Ukraine also show significant growth. The number of Maestro cards in circulation reached 8.15 million at the end of June 2005, representing a 53.2 percent growth over 2004. Debit cards using the Maestro payment system are now accepted in over 40 thousand shops.[80]

[78] http://proit.com.ua/telecom/2006/07/17/182333.html

[79] http://proit.com.ua/telecom/2006/07/12/124331.html

[80] ProUA, 16 September 2005 - http://it.proua.com/itnews/2005/09/16/111718.html

Despite this recent growth in electronic payment systems in Ukraine, innovative online payment systems, such as those which have been developed in Armenia, have not yet been developed or adopted in Ukraine.

Nevertheless, according to the Cabinet of Ministers Report on the implementation of the National Programme for Informatisation, 18 million dollars (14.9 million Euro) worth of goods were sold via the Internet in Ukraine in 2004. The purchase of computers and computer parts/consumables accounted for over half this figure.

5 USE OF ELECTRONIC COMMUNICATIONS SERVICES

There was an increase of 21.4% in communications services revenue between January and September 2006 – a total of 24.1 billion UAH (3.9 billion Euro). Over half of the revenue came from mobile services, with half of the remainder coming from fixed long distance and local phone services. Investment reached 5.4 billion UAH (0.88 billion Euro), an increase of 23%.[81]

Demand for new computers was estimated at just under 1m in 2004, a five-fold increase from 2001. High customs duties partly explain the fact that nine out of every ten computers sold in Ukraine are domestically assembled.[82]

Ukraine does not have a coherent, comprehensive Government system of statistical monitoring for the various branches of the ICT industry, which would allow accurate evaluation of the current situation with regard to ICT development and the level of its use in society. This leads to vastly diverging figures on ICT usage. To give one example, Government statistics show that the number of computers assembled in Ukraine is 55,000 units per year, while manufacturers maintain the number is closer to 500,000, with some estimates considerably higher than this.[83]

According to Ukrstat (State Committee on Statistics), revenue from the telecommunications market constituted 6.8 percent of GDP in the first 9 months of 2005.

In September 2005, the State Department for Telecommunications made 2004 data available to Parliament regarding the growth of communication services in Ukraine. According to these data, compared with 2003, access to mobile services had increased by 55 percent in 2004, fixed telephony by 10 percent and computer use by 33.6 percent.

5.1 Fixed Telephony Penetration

According to Ukrstat, fixed line penetration reached 23.2 percent[84] in 2005 and increased to 24.3 percent in October 2006.[85] Ukrtelecom continues to dominate the Ukrainian market place, currently connecting about nine million subscribers to its network.[86] Ukrtelecom has been working extensively with Cisco to upgrade IP services on its network, including for VoIP functionality, and is developing a next generation network.[87]

[81] http://www.cellular-news.com/story/19707.php

[82] http://globaltechforum.eiu.com/index.asp?layout=rich_story&channelid=4&categoryid=29&title=E-readiness%3A+Ukraine&doc_id=9245

[83] This information comes from the US Commercial Service Report "Doing Business In Ukraine: A Country Commercial Guide for U.S. Companies" of 2 August 2005

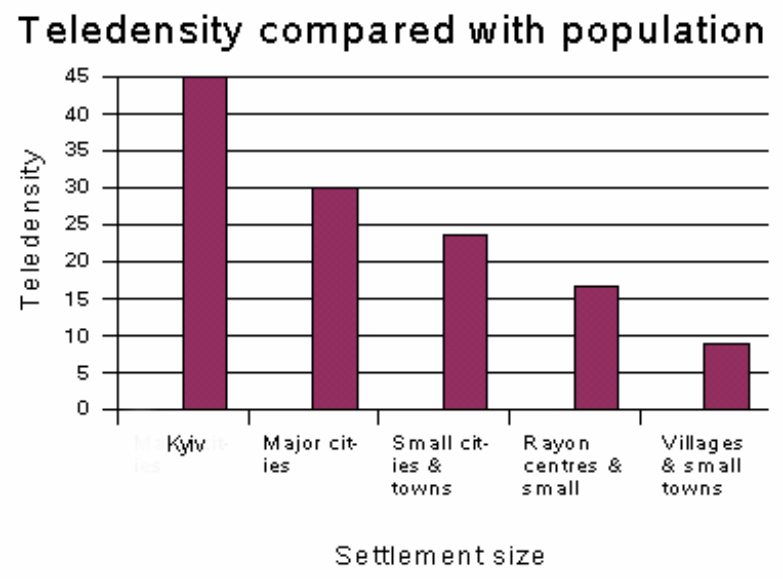
[84] Based on population and fixed telephone line data from Ukrstat. Both sets of data were published in October 2005.

[85] Based on population and fixed telephone line data from Ukrstat, both dated October 2006

[86] http://ukrtelecom.ua/en/about/general/today.

[87] http://newsroom.cisco.com/dlls/2005/prod_032305d.html

Fixed line telephone density was 24.3 percent as of 1 January 2006. However, this figure conceals a large urban/rural digital divide. Teledensities range from 45 percent in Kyiv to 9 percent in villages and small towns, and even less in more remote regions.[88]



5.2 Mobile Usage

Statistics from official sources indicate that there are 30 million mobile users, which indicates an average penetration rate of approximately 64 percent.[89]

5.3 Cable Services

According to data provided by the Cable TV Union of Ukraine,[90] there are approximately 300 cable operators providing services to approximately 12 percent of Ukrainian households. Only 10 percent of these have access to broadband services and only half of these actually avail of it. Annual growth is, according to this data, only 3 percent. However, against this lacklustre background, cable provider Volia is already offering advanced "triple play" services (television, Internet and telephony), with a subscriber base of over 735,000.[91]

[88] The graph below was created using data from V. A. Balashov, S. V. Zyablov and A. V. Nesterenko's Report "Ensuring General Access to Information Communication Services and Technologies in the Rural Areas of Ukraine" which was presented at the NTCA Conference, Kyiv 2004.

[89] http://www.mcapital.com.ua/onenews.php?id=40223, last visited 9 February 2006

[90] Reported by Broadband TV news http://www.central.broadbandtvnews.com/.

[91] Ruben Beliaev, "Cable Networks in Ukraine", 17 May 2005. Available at http://www.bisnis.doc.gov/bisnis/bisdoc/0506_ISACABLETV_UKRAINE.htm

According to industry specialists consulted in the research for this report, the estimated number of cable television customers varies from 2 million to 2.6 million households or approximately 7.5 million citizens. The total number of households in Ukraine is 17.7 million. Total coverage of the potential market of cable television customers in Ukraine is assessed at 25 percent. Every town with 50,000 or more citizens has a cable television network. The reach of existing cable television networks continues to grow at 5,000 households per month. However, this growth rate is far below growth rates recorded in 1997-1999 (10,000-15,000 households per month).[92]

5.4 Computer Availability

Given that the average gross monthly wage was about 182 Euro[93] in December 2005 and the cost of a PC is about 420 Euro, PCs and licensed software are affordable for only a small minority of citizens. However, the cost of PCs does not appear to inhibit businesses from using computers for their operations. 48.2 percent of all PCs were owned by private enterprises with 38.9 percent used by government offices, according to information provided to the Ukrainian Parliament by the State Department on Telecommunications in September 2005.

5.5 Internet Access

Internet usage is growing, albeit from a low base, and is hindered by the comparatively high cost of dial-up access and limited PC ownership. The Economist Intelligence Unit[94] has suggested that, while Internet usage is normally assessed at about 8% in Ukraine, the most recent research available suggests that this figure may be significantly higher. Internetworldstats.com puts the figure at 11.4%. Official statistics for August 2006 put the number of Ukrainians who accessed the Internet in the course of the previous month at 10.9%.[95]

The most used search engines are google.com (37,85 percent) and yandex.ru (32,0 percent).[96]

According to Bigmir.net research in 2006,[97] half of Ukrainian Internet users from Kyiv, with inhabitants of the other main cities accounting for over half of the remainder. Users from other large Ukrainian cities with a population of one million or more (Dnepropetrovsk, Odessa, Kharkov, L'vov, Donetsk, Zaporozh'ye) represent 32.16 percent of Ukrainian Internet usage (not including Kyiv). Users in the remaining regions

[92] "Byznes" No. 30, 2004 – http://www.business.kiev.ua

[93] http://www.ukrstat.gov.ua/operativ/operativ2005/gdn/Zarp_prom_m/Zp_pr_m_e/promm05_e.htm

[94] Economist Intelligence Unit, E-Readiness Ukraine, August, 2006

[95] http://www.jankoy.org/ua/page-924.html. See also http://www.multilingual-search.com/ukraine-has-3-million-internet-users-with-google-leading/14/04/2006/en/

[96] http://www.jankoy.org.ua/page-924.html

[97] A comprehensive report, in Russian, can be downloaded from the following URL: http://i.bigmir.net/index/UAnet_global_report_032006.pdf

of Ukraine equal 14.21 percent of Internet visitors. The region with the lowest level of Internet use, at 0.21 percent, is the Rivnenskaya region.

Users in Kyiv also generate a significantly higher amount of traffic in terms of page views. Most of the top 10 websites in Ukraine are search engines (Google, Yandex and Meta being the top three, the rest being traffic measurement sites). Top searches are focussed on academic and leisure activities.

The number of hosts in Ukraine is now more than 94,000.

Regarding Internet usage, according to research conducted by Volia cable company, most Ukrainians use the Internet for business purposes.[98] Volia's research showed that:

- 87.6 percent of respondents consider Internet usage for business purposes as justified from a commercial point of view;
- 48.9 percent of enterprises have already been connected to the Internet for one or two years, 34.6 percent for more than three years, and 15.4 percent for less than a year;
- 62.2 percent of enterprises are currently working online using dial-up and only 32.4 percent use always-on connections. 54.3 percent use their sole phone line for dial-up Internet access.

Ukrtelecom has recently taken concrete steps to encourage the mass take-up of broadband services. In March 2005, there were only 10,000 DSL lines in Ukraine.[99] At that time, DSLAMs had been installed in 450 locations in Ukraine, and work was underway with Cisco to provide capacity to permit a 1000 percent increase in DSL subscribers by the second half of 2006.

Dial-up Access Charges (Adamant[100] – November 2006) using internet card INET

Service package	Time	Cost per hour UAH/Euro
"By hour +Callback" (with per second billing))	03:00 - 08:00 08:00 -03:00	Free of charge 0,80 UAH/hour
"By hour" (with per second billing)	03:00 - 08:00 08:00-03:00	Free of charge 0,80 UAH/hour
"INET-24 hours + Callback"	0:00-24:00	10 UAH per day (1.60 Euro)
"INET-24 hours"	0:00-24:00	5 UAH per day (0.80 Euro)
"Evening"	20:00-0:00	2,66 UAH/evening (0.43 Euro)
"Night"	0:00-8:00	2,66 UAH/night (0.43 Euro)

[98] This information can be accessed at http://www.volia.com/.

[99] http://www.lightreading.com/document.asp?doc_id=70732

[100] http://www.adamant.ua/

"Weekend"	0:00-24:00	2,66 UAH per weekend (0.43 Euro)

The following, as an example, is the price list for cable broadband via Volia[101] cable:

Cable broadband access charges (Volia cable) (November 2006)
"Universe" tariff plans with combined traffic accounting

Monthly Subscription Fee including VAT, UAH	Amount of mixed traffic included in Monthly Subscription Fee, MB	The cost of 1 MB of mixed traffic including VAT, UAH
20 UAH / 4.06 Euro	200	0.10 UAH 0.016 Euro
50 UAH / 8.11 Euro	1,000	0.05 UAH / 0.008 Euro
100 UAH / 24.33 Euro)	5,000	0.02 UAH / 0.003 Euro

Research published in March 2006 gives a good overview of how users access the Internet in Ukraine.[102]

	Audience	The average time of use
At home	68.88%	2:29:10
At work	54.60%	3:36:33
At school/university	11.24%	1:29:16
Internet café	15.01%	2:16:31
At friends/ relatives	10.22%	1:54:42
Other place	5.33%	2:14:59

It should be noted, however, that this is not a nationwide picture. According to korrespondent.net (amongst others), about half of Internet users are based in Kyiv, with the next four biggest cities accounting for a further 32.16 percent.

5.6 Public Internet Access Points (PIAPs)

Various efforts have been made to boost Internet access via PIAPs. For example, the US Embassy gave grants of over 1.4 million US$ (1.17 million Euro) to libraries for this purpose in the period from 2001-2004. Also, the UN Development Programme and the German International Migration and Development Centre[103] have joined forces with local organisations to develop training and support for the creation of PIAPs in Ukrainian schools, the intention being to boost both IT in education and improve the level of Internet access in schools. Pilot projects have also been launched in an effort to improve universal service provision in remote areas.

There are over 3,000 computer clubs and cafes in Ukraine (equating to one for every 16,000 people in Ukraine).[104]

[101] http://www.volia.com/internet/price_home_eng

[102] Published at http://www.novyny.org.ua/

[103] http://www.cimonline.de/en/index.asp

[104] http://www.uacc.org.ua/en

5.7 Wireless Internet Access

Wireless Internet access is developing slowly in Ukraine, partly due to the fact that Wi-Fi is licensed spectrum. Ukrtelecom is planning to launch Wi-Fi services in the larger towns and cities in Ukraine, while other ISPs are beginning to launch WiMAX services. Luckynet,[105] provides a range of high-speed wireless broadband access services.

A Wireless Internet Association[106] was established in order to deal with a wide variety of perceived problems with launching wireless services in Ukraine including conflict resolution, legal framework, illegal content, and harmonization of standards and norms.

According to feedback from the Ukrainian Mission to the EU, the Ukrainian Government is keen to support the roll-out of WiMAX services, in order to ensure low-cost Internet access for as many citizens as possible.

A new plan for the management of spectrum was adopted in April 2006, detailing the management of resources for Wi-Fi, WiMAX, 3G and other relevant technologies. Services are being launched by a joint venture of Networks by Wireless[107] (UK) and PAN Telecom[108] (Ukraine)/PAN Wireless.

On 9 October 2006, Kyivstar began offering Wi-Fi services[109] to its customers via smartphone, laptop or pocket PC. UMC has also shown interest in providing Wi-Fi services.

The maximum data transfer rate is 54 kb/sec. The consumer sends a premium rate SMS, either for a “sample access”, allowing just one Mb of download capacity, or full access, which is sold in increments of 5Mb.

Number for SMS-sending (with any text)	Cost of SMS, per message (including VAT), UAH	Traffic volume, Mb
For test access	0,33 (0.05 Euro)	1
For usual access and balance recharge	7,50 (1.21 Euro)	5

Ukraine is one of the few countries prohibiting or prohibitively taxing IP telephony, Wi-Fi, and WiMAX networks, both public and private. The restrictions on advanced communications technologies in Ukraine are very unusual. The provision of advanced communications services in Ukraine is difficult. Providers of VoIP have to engage in a complex and costly process of obtaining a licence, as do Wi-Fi providers.[110] Some

[105] http://www.lucky.net/eng/main/news.shtml

[106] http://www.wirelessua.com

[107] http://www.nbw.net/

[108] http://www.pantele.com.ua/eng_index.html

[109] http://www.kyivstar.com.ua/en/press_center/news/common/?id=1118

[110] http://www.newproject.org/news/2006/8/8/providers-on-the-run-in-ukraine-as-sbu-battles-low-cost-telephony.html

analysts argue that these laws emanate from Ukrtelecom lobbying to curb or eliminate competition in the ISP and voice telephony markets.[111]

Wireless local loop (WLL) operator Telesystems of Ukraine is planning to invest around 180 US$ million (149 million Euro) to roll out CDMA2000 1xEV-DO technology in the next three years. Telesystems already offers WLL connections using EV-DO on a trial basis in Kiev, following a rollout in partnership with Chinese equipment provider Huawei Technologies. It has signed contracts with LG, Pantech, ZTE for the construction of a nationwide network, with the aim of launching commercial services in Kiev, Odessa and Dnepropetrovsk in the near future.

The NCCR is in the process of auctioning five licences for WiMAX broadband services, following interest by thirty operators. Technological Systems (a subsidiary of Comstar–United[112]) has received a licence for the provision of WiMAX-based services in the 5.4 – 5.7 GHz range through a regional tender. It is believed that this licence cost $0.8m (0.66 million Euro).[113]

Ukrtelecom has chosen Nokia to provide network equipment for its planned 3G service. Nokia will also provide equipment for Utel's W-CDMA network, which will initially be launched in Kiev.

[111] http://www.newproject.org/news/2006/8/8/providers-on-the-run-in-ukraine-as-sbu-battles-low-cost-telephony.html

[112] http://www.comstar-uts.com/

[113] http://www.digitalmediaasia.com/default.asp?ArticleID=19849

6 AVAILABILITY OF ONLINE SERVICES

The EU-Ukraine Action Plan for 2005 foresees the widespread use of electronic communications services by business and administration, in particular in the health and education sectors (e-Commerce, e-Government, e-Health, e-Learning), via the provision of advanced infrastructures, the development of local content and the introduction of pilot projects initiatives.

Ukraine ranked second highest among the four countries in this study included in The Economist E-readiness rankings 2005,[114] with a total score of 3.51, scoring best in business environment and worst in consumer and business adoption. In 2006, Ukraine improved its score and achieved 3.62 points, albeit while dropping from 57th to 61st overall in the table of 68 countries.

6.1 E-Commerce

E-Commerce is developing very slowly in Ukraine. The low level of Internet penetration in the country is a key problem, with the most optimistic estimates suggesting that there are 6.5 million Internet users,[115] which equals approximately 13 percent of the population. Finally, the legal framework for e-commerce is also still lacking, although improvements are being made.

The leading Ukrainian online retailer city.com.ua receives approximately 8,000 hits daily.

Domain name registrations

Apart from the 47 geographical (such as kiev.ua) domains, there are seven generic suffixes for organisations registered in the .ua domain, according to their type: com.ua - commercial organizations; gov.ua-government agencies; net.ua - suppliers of network services; edu.ua – educational organizations; org.ua - other organizations (not commercial), in.ua for individuals and dominic.ua for the community of Dominican friars. The .ua domain is managed by the UA NCG (Network Coordination Group).

There has been a steady increase in the number of domains registered under .ua. For example, under .com.ua, the total number of domains increased from 31,153 in 2004 to 42,489 in 2005 and reached 54,187 by September 2006. The overall number of domains under .ua increased from 133,907 in 2004 to 169,644 in 2005 and had already reached 211,478 by September 2006.[116]

[114] Economist E-Readiness Report 2005 http://graphics.eiu.com/files/ad_pdfs/2005Ereadiness_Ranking_WP.pdf

[115] Based on information from the State Statistics office.

[116] Presentation made at the RIPE regional conference in Moscow, September 2006. The presentation can be downloaded from: http://www.ripe.net/meetings/regional/moscow-2006/presentations/ua-cctld.pdf

6.2 E-Government

One of the key aims of the National Informatisation Programme, which is prepared by the Ministry of Transport and Communications each year, is to develop the use of ICT in central governmental bodies. Overall coordination is exercised by the Ministry of Transport and Communications.

The Cabinet of Ministers Resolution of 24 February 2003 (N208) on the Development of Electronic Government and the Order of the State Telecommunications Committee of Ukraine of 15 August 2003 govern the development of access to e-government services by citizens and businesses.

The list of e-Government legislation passed in Ukraine, albeit all under previous regimes, is very long. The Government portal lists a total of over forty different acts passed in the course of the past seven years, half of which were passed in 2003 and 2004.

Since 1998, the Ukrainian Government has produced a number of legal documents requiring state bodies to publish information about their activity on the Internet. There is a functioning Government portal,[117] which is a gateway to the existing sites of state departments, but much work still needs to be done. For example, only 12 percent of city authorities have websites.

Legally, all state departments are supposed to have websites on the Internet. These websites are not currently interactive, focussing instead on information provision about the department, its leaders and operational procedures. With recent developments in the use of electronic signatures in Ukraine, possibilities are increasing for more user-friendly interaction with government services. For the moment, however, most government websites are “one way”, with functionality improving. An example of the planned improvements is that the Ukrainian tax authorities are planning a new improved web-based service.

The tax administration of Ukraine is undertaking a pilot project which allows company tax account reports to be accepted in electronic format. These reports are provided on floppy diskettes, as there is still no online submission. One basic problem is that in Ukraine there has been little or no practical implementation of the Law on Electronic Digital Signatures, which makes the introduction of online e-government services more difficult. This situation is currently undergoing change (see above on digital signatures).

The government of Ukraine does not have nationwide programs governing the use of software in public administration, including regarding the use of open source software. Microsoft has signed an agreement with the government of Ukraine, under which it will provide software to government institutions at one-third of the market price. The agreement reflects a long-term preferential pricing scheme for government bodies.

[117] See http://www.kmu.gov.ua/control/

6.3 E-Health

E-Health has a long history in Ukraine: there is a long tradition of e-health theory development in Ukraine, although it is still not very widespread in practice. The Ukrainian telemedicine website,[118] maintained by the Donesk Institute of Traumatology and Orthopaedics lists fourteen telemedicine centres, twenty-three institutions which carry out "teleconsultations", and five online pharmacies. The Department of Informatics and Telemedicine of Donetsk has also developed a distance-learning tool. The Centre for Telemedicine of Ukraine has provided half of the best practice models listed on the website of the International Society for Telemedicine and e-Health.[119]

6.4 E-Learning

E-learning is somewhat limited in Ukraine, although this is one of the items that are being addressed by the EU-Ukraine Action plan, and EU funding is already being used to establish some resources. For example, an Electronic Media Resource Centre is being established with the help of the EU Tempus programme.[120] The only Ukrainian member of the European Distance and E-Learning Network is the Inter-regional Academy of Personnel Management.[121]

Approximately 52 percent of secondary schools have computer equipment, while only 14 percent of them have Internet access. There are wide regional variations regarding access to IT in schools.[122]

[118] http://www.telemed.org.ua/wwwtm_eng/TMCAT/tmucat.html

[119] http://www.isft.net/cms/index.php?id=1

[120] Details of this particular project can be found on the project website: http://emerecu.ukma.kiev.ua/

[121] http://www.maup.com.ua/

[122] Pazyuk, A, Ukraine on the Way to the Knowledge Society' ed. A.Pazyuk 2005, pages 38-46

7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY

7.1 Fixed Networks

7.1.1 Ukrtelecom

Currently, Ukrtelecom is the monopoly fixed line operator, which gives it a special status in the market and makes it impossible to apply antimonopoly measures against it. In addition, it is not possible to find precise information regarding what Ukrtelecom owns specifically in terms of real estate and equipment.

The privatisation of Ukrtelecom has been mooted on many occasions over the years, but has not yet been achieved for various reasons. The Ukrainian Parliament in voted in favour of privatisation in December 2006 – only 50.22% (226 out of 450) of parliamentarians voted in favour, though only six voted against. Currently, 92.86 percent of Ukrtelecom shares are owned by the State, with the remaining shares owned by employees.

Ukrtelecom has 9.8 million customers, 27 regional divisions, a trunk telephone line operator, and central telephone and telegraph stations. Its trunk network is 70 percent digitised, but only 30 percent of the local network is digital. The company owns Utel,[123] Ukraine's leading long distance operator with 2004 sales of 366 million US$ (302.5 million Euro). Jointly with Utel, Ukrtelecom controls 83 percent of the local calls market and 95 percent of the domestic long distance and international long distance segments; Golden Telecom[124] and Optima[125] control the remainder. Domestic long distance and international long distance services generate about 67 percent of Ukrtelecom's consolidated revenues; local calls, due to low tariffs, account for only 28 percent.[126] Ukrtelecom also offers such services as television and radio broadcasting, Internet access and ISDN.

Profits at Ukrtelekom are expected to decline due to increased competition from mobile operators, overstaffing and regulatory uncertainty. Ukrtelekom, which has a fixed-line monopoly, is scheduled for privatisation in 2007. Georgiy Dzekon, Ukrtelekom's chairman, said the company installed 700,000 new lines in 2005, while Ukraine's four mobile operators added about 15 million new subscribers. The company's profits fell to 103 million US$ (85 million Euro) in 2005, from 190 million US$ (157 million Euro) in 2004. Officials expect Ukrtelekom to reveal profits of about 80 million US$ (66 million Euro) for 2006.

The following table, from the Ukrainian State Statistics Committee[127] gives an indication of the level of involvement of the State in the communications industry and the revenues generated from the provision of the various services:

[123] http://www.utel.ua/english

[124] http://www.goldentele.com/eng/

[125] http://optima.ua/

[126] All data from http://www.ukrtelecom.ua

[127] http://www.ukrstat.gov.ua/, figures are from 2004

Revenues provided by communication services, January -September 2006[128]

	Revenues, total mln. UAH	Of which, for services provided to population
Communication services, total	**24138,7**	**9633,5**
of which		
post-office services	954,2	214,2
of which: international express mail EMS	10,1	3,9
telegraph services	35,8	12,1
urban telephone network services	2086,8	1225,2
rural telephone services	162,1	138,9
long-distance (including international) telephone services	4657,5	2065,6
express activity	127,5	2,5
broadcasting services	51,2	38,9
special and communication services	46,2	0,0
TV and Radio broad casting services	624,2	385,8
cable TV	392,8	382,8
state inspection of electric communication	152,9	0,9
satellite services	50,8	0,0
computer services	910,1	175,9
of which: provision of an access to the Internet	766,5	173,8
mobile services	14279,4	5373,5
of which,		
cellular	14263,4	5372,9
pager	4,8	0,0
trunk	11,2	0,6

The international and long distance telephony market is divided between Ukrtelecom (92 percent) and approximately 10 other 10 operators, which collectively account for about 8 percent of the market.

The key problems in the market are:

1. Monopolisation of the market by Ukrtelecom;
2. The lack of development and implementation of a strategy for the development of international and long distance telephony detailed in the Concept for Telecommunication Development, which was approved by the Cabinet of Ministers in June 2006.
3. The absence of adequate mechanisms of measurement of international and national long distance telephone communications traffic separation.[129]

[128] Data from the Ukrainian State Statistics Committee

[129] See http://www.wik.org/content/konf_istanbul/hayduk.pdf

Ukrtelecom's net profit for the first half of 2006 decreased by 18 percent compared with the same period in 2005, totalling 62 million UAH (10.06 million Euro). Ukrtelecom's net profit from services including IP and Internet charges increased by 34 percent compared with 2005, totalling 237 million UAH (38.5 million Euro). Its net profit for international calls for the first half of 2006 decreased by 11.5 percent, when compared to the same period of 2005.[130]

Fixed-line capacity has increased at an average annual rate of around 6 percent (of installed capacity) in recent years. Ukrtelecom has introduced digital exchanges in the majority of regional centres and had 40,000 broadband access ports available by the end of 2005. However, improvements in local networks and local exchanges continue at a very slow rate. The telecommunications infrastructure outside of major cities and regional centres still relies on obsolete equipment and analogue local loops, and telephone density remains low.

Ukrtelecom owns Ukraine's primary network and trunk and zone telecommunications lines. In preparation for planned privatisation, Ukrtelecom has been restructured and comprises 30 branches providing basic telecommunications services to 9.8m subscribers.

Some private operators exist, including Golden Telecom (GT), Farlep and Optima. There are also four fixed wireless access (FWA) operators. Private operators focus primarily on offering premium services to business customers. Utel and Golden Telecom control the fixed-line business market. Ukrtelecom provides a range of telecommunications services, including ISDN, Internet network access, data transmission, and satellite and video-conferencing communications. GT offers a one-stop-shop range of products, from digital telephone lines, mobile telephones and Internet accounts to high-speed private leased circuits and international frame-relay services.[131]

7.1.2 Golden Telecom

Golden Telekom Ukraine[132] is wholly owned by the Russian company Golden Telecom Inc. and provides communications services to the business market. The owners of this Russian company are the Alpha Group (29.9 percent), Telenor (20 percent), Rostelekom (11 percent), EBRD (8 percent), and investment companies Barring East (7 percent) and Capital (6 percent). 18 percent of the stocks are on the stock market or belong to the top level of management.[133]

Golden Telecom has contracted Alcatel to deploy a fixed/mobile converged network with a next generation network core and UMA (unlicensed mobile access) capability. Alcatel believes that this will be the first fixed/mobile convergence network deployment in Ukraine.[134]

---

[130] http://proit.com.ua/telecom/2006/08/21/120919.html

[131] http://globaltechforum.eiu.com/index.asp?layout=rich_story&channelid=4&categoryid=29&title=E-readiness%3A+Ukraine&doc_id=9245

[132] http://www.goldentele.com/eng/

[133] ProUA News, 14 September 2005 - http://proit.com.ua/itnews/2005/09/14/105043.html

[134] http://www.dmeurope.com/default.asp?ArticleID=18809

Golden Telecom (Ukraine) and Ukrainian Radio Systems (Beeline(TM)) have signed an agreement allowing GT subscribers to use the Beeline network, greatly increasing network access for the former's customers.

7.1.3 Optima

The private company Ukrainian Radio Systems, (which owns such trademarks as WellCom[135] and MOBI[136] and provides services to the virtual operator PrivatMobile[137]), was founded by four companies (of which three are offshore businesses) that are part of the Privat group. These companies are: Ukrfondinvest, 31 percent; Ravenskroft Holding Limited (British Virgin Islands), 20 percent; Occidental Management Company Ltd (Cyprus), 24.5 percent; and Optima Telecom Inc. (USA), 24.5 percent. This group's network (the Optima[138] network) covers 11 regional centres in addition to serving as a backbone for the mobile network of Ukrainian Radio Systems.

Besides mobile and fixed line communications operations, Privat Group's portfolio also includes long-distance IP-telephone operator Ukrkom[139] and large Internet providers Alkar-Teleport,[140] IP -Telecom[141] and Digital Generation.[142]

Currently the group of "Optima" companies is being prepared for sale. In early 2005, the anti-monopoly committee of Ukraine permitted the Cypriot company Sparotin Limited (previously unknown on the Ukrainian market) to purchase more than 50 percent of Dnepropetrovsk company Optima Telekom, and its regional affiliates Altek (Kherson), ORT-YUG (Kherson), Telephone company ELS (Odessa), SWIT (Zaporozh'ye), LyuZa (Zaporozh'ye), Optima-Service connection (Sevastopol), At-connection (Krivoy Rog), Belotserkovskiy Telephone company (Belaya Cerkov, Kyiv region) and Sveton (Kherson region). Sparotin Limited is also buying a number of Internet providers: Alkar-Teleport (Dnepropetrovsk), Ay Pi Telekom (Kyiv), Digital Generation (Kyiv), M.C.I. (Kyiv), Infokoms (Kyiv), and such companies as DATAS (Kyiv), Optima-Service connection (Kharkov), Optima-Service connection (Odessa), and Optima-connection (Odessa), which was inactive from 2002-2004.

The fixed telephony sector, which is dominated by the incumbent, suffers from slow development, extensive state regulation (in particular regarding prices) and low margins, especially in rural regions, which are generally unprofitable.

[135] http://www.wellcom.ua/

[136] http://www.mobi.ua/

[137] http://privatmobile.com.ua/

[138] http://start.optima.ua/

[139] http://www.ukrcom.kherson.ua/

[140] http://www.alkar.net/

[141] http://www.iptcom.net/

[142] http://www.dg.net.ua/

7.2 Mobile Networks

Kyivstar accounted for 43.8 percent of the total subscriber base in September, UMC accounted for 40.5 percent, while Astelit and URS accounted for 12.7 percent and 2.3 percent respectively.[143]

Key problems currently faced by the market are the absence of further development of management of radio frequency and ineffective usage of existing frequency by some operators.

Ukrtelecom has been awarded a 3G licence for UAH152 million (25 million Euro). Kyivstar, UMC, Astelit and URS have also applied for licences. Three licences are likely to be auctioned once the relevant spectrum has been transferred from military to civil use.

UMC[144] and Kyivstar[145] are the largest operators in the mobile cellular communications market. 100 percent of UMC's stocks belong to the Russian telecommunications company MTS (joint stock company Mobile TeleSystems). In 2002, Ukrtelecom sold its 51 percent stake in UMC to Russia's MTS for 172 million US$ (142.15 million Euro) whilst the remaining shares were purchased from Deutsche Telekom, Teledanmark and KPN in 2003. 56.51 percent of Kyivstar stocks belong to the Norwegian telecommunications company Telenor, with the remaining 43.49 percent of the company owned by Storm (which is owned by a Russian company, the Alpha Group).

7.2.1 Kyivstar GSM

Kyivstar had more than 17.216 million subscribers on 1 September 2006, with its Ace&Base brand holding 9.028 million and its DJUICE brand holding 7.034m (in July - 6.823m) customers, and also 1.154 million contract and corporate subscribers; with network coverage of 92 percent of the population.

Kyivstar provides GPRS services over all areas covered by its network and also international GPRS-roaming services in 69 countries within the networks of 110 foreign operators. For "ACE&BASE" and "DJUICE" prepaid package subscribers, Kyivstar provides international roaming services in 18 countries with networks of 20 foreign operators. For contract subscribers, Kyivstar provides roaming services with networks of 285 foreign operators in 153 countries.

Kyivstar increased investments by 219 percent to expand its network in the period September 2004 to September 2005 (from 124 million US$ (102.47 million Euro) to 272.3 million US$ (225.04 million Euro)).[146]

Kievstar published the following results of the first half of 2006:[147]

	First half 2006	First half 2005

[143] http://www.cellular-news.com/story/19810.php

[144] http://www.umc.ua/

[145] http://www.kyivstar.net/

[146] All data from Kyivstar

[147] http://market.mabila.ua/news/2006/09/28/5200.html

Net Sales *(US$ / Euro) (thousands)*	**757,270 / 625,842**		450,900 / 372,644	
EBITDA (the profit before taxation, without amortisation *(US$ / Euro) (thousands)*	**461,843 / 381,688**		242,703 / 200,581	
Net profit *(US$/ Euro) (thousands)*	**243,901 / 201571**		103, 590 / 85,611	
ARPU (average monthly revenue per mobile user, *US$/Euro*):	Q1 2006	Q2 2006	Q1 2005	Q2 2005
total	7.9 / 6.5	8.6 / 7.1	8.9 / 7.4	9.7 / 8.0
contract user	26.2 / 21.7	28.7 / 23.8	26.5 / 21.9	29.4 / 24.3
pre-paid user	6.4 / 5.3	7.1 / 5.9	6.8 / 5.6	7.6 / 6.3
AMPU (monthly amount of minutes per subscriber)	**110**	**118**	92	90

Vimpelcom has made a bid of 5 billion US$ (4.13 million Euro) for Kievstar, which would include the Russian company taking over some of the Kievstar's 456 US$ million (377 million Euro) debt.

7.2.2 UMC

The UMC network covers more than 87 percent of the territory of Ukraine. UMC provides roaming services to prepay and contract customers. UMC subscribers can also take advantage of privileged roaming rates when using the MTS network in Russia and Belarus.

According to UMC, the total subscriber base was 15,933 million in August 2006. This breaks down between Jeans subscribers (7,609m subscribers) and SIM-SIM (6,932m subscribers). UMC had 1,392 million postpaid customers in August 2006.

UMC's net profit amounted to 232 million US$ (191.74 million Euro) in 2004. Between January-June 2004, net profit stood at 147 million US$ (121.49 million Euro).[148]

7.2.3 URS

Russian firm Vimpelcom (Alpha Group owns 32.9 percent of its stocks and Telenor is another major shareholder) recently decided to strengthen its position in the Ukrainian market by agreeing to purchase 100 percent of Ukrainian Radio Systems' (URS) network, WellCOM.[149] This acquisition has been the subject of some internal disputes in Vimpelcom, as Telenor opposed this takeover, while it was supported by Alpha Group. The purchase cost 231.3 million US$ (191.16 million Euro). This price included the purchase price of 206.5 million US$ (170.7 million Euro), plus expenditures of 24.8 million US$ (20.5 million Euro) incurred by URS with prior approval from Vimpelcom in accordance with their EGM approval. Vimpelcom also assumed debts of approximately 23.5 million US$ (19.42 million Euro), including 22.8 million US$ (18.84 million Euro) of debt owed to an affiliate of the seller). Although it has lost various court battles on the

[148] All data from UMC

[149] http://www.welcome2well.com/

acquisition of URS, Telenor remains opposed. In December 2006, it voted against Vimpelcom's annual budget.

URS has a GSM-900 licence that covers the entire territory of Ukraine, URS also has a GSM-1800 licence that covers 23 of Ukraine's 27 administrative regions (excluding the City of Kyiv, the Kyiv Region, the Dnipropetrovsk Region and the Odessa Region i.e. the most prosperous regions). The 23 regions include approximately 79.8 percent of Ukraine's population, according to Ukraine's State Committee of Statistics.

7.2.4 DCC/Astelit

Turkish cellular operator Turkcell[150] (51 percent) and Donetsk System Capital Management (49 percent) are the principal owners of the Dutch-registered company Eurasia Telecommunications Holdings B.V, which is based in Ukraine. This company owns the venture Digital Cellular Connection of Ukraine (DCC[151]). The company provides mobile services to subscribers in the DAMPS standard, and also owns 99 percent of the private company Astelit, which operates under the Life:)[152] brand (Life:) also provides mobile services).

The number of subscribers of DCC, which provides services in eight regions, remains stable at about forty thousand.[153]

The third biggest operator of mobile communications, the "Astelit" company (operating under the brand name "life:)") has increased its subscriber base in line with overall market trends. The company reported a 32% growth in from January 2005 to January 2006.[154] Its network covers most major conurbations in Ukraine, and there are plans to increase this to 91 major towns.155 In September 2006, the company had 4,7 million subscribers.

The company DCC ceased to exist as a legal entity in August 2006.

Astelit has extended its agreement with Nokia for the provision of GSM/EDGE equipment for expansion of its network in the west and east of Ukraine. The agreement is worth a total of 75 million US$ (62 million Euro). This additional contract was announced by Nokia in March 2006 although no specific roll-out timetable was given.

7.2.5 Fibre-optic Network Rollout by Mobile Operators

7.2.5.1 Ukrtelecom

Ukrtelecom is the largest owner of primary networks and fibre-optic networks in Ukraine and was recently awarded a 3G licence, for which it paid 152 million UAH (24 million Euro). As of April 2005, Ukrtelecom's overall telecommunications network consisted of 78,665km of lines, of which 17,169km were fibre-optic communication lines.

---

[150] http://www.turkcell.com.tr/index/0,1028,300427,00.html

[151] http://www.dcc-ua.com/

[152] http://www.life.com.ua

[153] The Internet-edition of Podrobnosty, "Economy. Transport and communications", on June 7, 2005, http://www.podrobnosti.ua/economy/transportational/2005/06/07/217891.html

[154] Data from FinRusGateway, Bulletin May 2006

[155] ProUA, 14 September 2005 - http://proit.com.ua/itnews/2005/09/14/105043.html

According to Bogdan Kostik, the Director of Management of the Primary Network Department of Ukrtelecom, in 2004 Ukrtelecom had completed construction of the main fibre-optic network, with all regional centres in Ukraine having fibre-optic connections from at least two directions. In addition, Ukrtelecom has digital connections to all neighbouring countries (Moldova, Romania, Hungary, Czech Republic, Poland, Belarus and Russia). Ukrtelecom is in the process of rolling out second connections to Belarus, Hungary and Romania.

4,220 km of fibre-optics were laid over the course of 2004 (2,810km for main fibre-optic lines and 1,410km for local networks) and subsequently put into operation. In 2005, Ukrtelecom focused on the development of local fibre-optic networks. In 2005, a further 3,703km of local fibre-optic network was put into operation together with 97km of main fibre-optical lines.

In the summer of 2004, Ukrtelecom concluded a contract worth approximately 13.3 million Euro with an Israeli company, ECI Telecom.[156] This contract aims to deliver a multiservice platform (XDM MSPP) for a national network. According to the contract, ECI Telecom will develop and provide support for the XDM platform in more than 50 national centres, enabling the creation of a national multiservice transport network based on Dense Wavelength Division Multiplexing (DWDM), Synchronous Digital Hierarchy (SDH) and Ethernet technologies. In the first quarter of 2005, construction of the first three rings based on DWDM technology (the first stage of the project) was completed.

The length of the first stage of this DWDM-project is about 4,500km. The second stage of the project is currently being finished and will bring into operation two more DWDM rings. After the end of the second stage of the project, all regional centres in Ukraine will be united by DWDM-rings. In the future, Ukrtelecom will implement a third stage to introduce DWDM technologies on a local level. Details of this stage have not yet been established. The plans will depend on the cabling of fibre-optic networks and also on Ukrtelecom's options for financing the project.

7.2.5.2 UMC[157]

In 2004, the Ukrainian Mobile Communications company laid 2,500km of main fibre-optic lines, bringing their network up to a total of 5,000km. In August 2004 its main ring, connecting Dnepropetrovsk, Zaporozhye, Sevastopol and Kherson, was brought into operation. In total, the backbone network unites 11 communication centres.

UMC's fibre-optic network is being rolled out energetically, with the aim of providing a second network that is on a par with that of Ukrtelecom.

7.2.5.3 Kyivstar GSM[158]

At the end of 2004, Kyivstar GSM's network was more than 6,000 km in length. In October 2004, work was completed on the final stage of the modernisation of the

[156] http://www.ecitelecom.com

[157] http://www.umc.ua/

[158] http://www.kyivstar.net/site.php/en

company's digital network. The SDH network, with a length of 5,000km, will eventually unite most regions in Ukraine and it will be constructed based on XDM technology. All the major cities and some of the larger regional centres will be integrated into the company's main network.

At the end of 2005, the company was finishing the construction of another 3,000 km of main lines.

7.2.5.4 URS-Optima

In May 2005, the Joint-Stock Company Ukrainian Radiosystems (URS)[159], together with the telecom operator Optima Telecom,[160] put into operation a trunk communication main line on the basis of DWDM technology. This network of more than 800km provides high-speed data transmission between Kyiv, Dnepropetrovsk and Kharkov. The fibre-optic channel supports traffic transfer on four wavelengths at a speed of 2.5GBps. The general throughput of the main line is 10GBps.

In the near future, the cities of Zaporozhye, Cherkassy, Kirovograd, Kremenchug and Dneprodzerzhinsk will be connected to the DWDM network.

7.3 Cable Networks

Despite the fact that the regulatory environment (see licensing above) is somewhat difficult for cable operators, there are cable networks available in most large cities in Ukraine. The Kyiv operator Volia, which has been offering advanced "triple play" services for some time now, being a significant example of the potential for the sector.

According to the State Statistics Committee, the revenue of the cable operators increased by 5.6 percent from 42.099 million UAH (6.8 million Euro) to 44.448 million UAH (7.2 million Euro) in 2005.

7.4 Internet Access Networks

As mentioned above, Ukraine's score in the Economist e-readiness rankings was 61st in the list of 68 countries. Within the Eastern European area, Ukraine was 12th out of the 14 countries covered, ahead of only Kazakhstan and Azerbaijan.[161]

Bytemobile,[162] Inc., a global provider IP service provider for mobile networks, is working with Astelit to develop its EDGE+ and GPRS+ services. This will provide accelerated

[159] http://www.welcome2well.com/eng/main/index.htm

[160] http://optima.ua/

[161] http://globaltechforum.eiu.com/index.asp?layout=rich_story&channelid=4&categoryid=29&title=E-readiness%3A+Ukraine&doc_id=9245

[162] http://www.bytemobile.com

Internet access, which Astelit hopes will provide it with the fastest available Internet access without using 3G technology.

Opportunities for ADSL have been very limited to date and, to the extent that they are available, this is usually through the incumbent. In 2005, Cisco and Ukrtelecom announced a major programme of upgrading IP links between the capital and regional centres as well as of further extending the upgrading of Ukrtelecom's capacity to provide ADSL.

A range of independent companies offer dial-up Internet access, in addition to Ukrtelecom.

Furthermore, in June 2006, the NCCR launched a tender for use of WiMAX frequency. There is already one WiMAX provider on the market – Ukrainian High Technologies[163] – providing services in Kyiv and Kharkiv. The company has plans to roll-out services nationwide.

7.5 Satellite Operators

Satellite providers such as Lucky Link[164] provide Internet access services. Lucky Link offers connection speeds of 512kbps, and VSAT connections at a speed of 256kbps downstream and 64kbps upstream. In addition, Thuraya[165] offers satellite telephony and GPS services.

7.6 Production of IT Services

Ukraine's information technology market is valued at between 800 million US$ (660 million Euro) to $1 billion US$ (826.5 million Euro). There is a perceptible, ongoing increase in demand for the production of IT products for export. Exported Ukrainian IT services totalled 70 million US$ (57.85 million Euro) in 2003 and 100 US$ (82.64 million Euro) in 2004. By the end of 2005, this figure was estimated to have reached 150 million US$ (123.97 million Euro).[166]

Telecommunications market revenues constituted 6.8 percent of GDP in the first nine months of 2005, according to the State Statistics Committee.

The State Statistics Committee of Ukraine has also conducted an analysis of the operating systems used by almost 70,000 organisations in Ukraine. Their findings are as follows: 71.9 percent use Microsoft Windows; 20.7 percent use DOS; 5.9 percent use

[163] http://www.uht.com.ua/ru/plain445

[164] http://www.ll.net.ua/english/index.html

[165] http://www.thuraya.com.ua/enews.htm

[166] All data prepared by the State Department for Telecommunications of Ukraine for parliamentary hearings on the development of the information society in September 2005

Linux; 1 percent use Unix/Fix; 0.1 percent use Os/2; 0.1 percent use OC EC/CBM EC; and the remaining 0.4 percent use other operating systems.

Ukraine is slowly emerging as a low cost hub for high quality software development. The producers work mostly alone or in small groups on outsourced projects ordered from abroad. These activities are usually not reflected in official statistics. There is growing interest among Ukrainian computer companies to establish software production centres that could participate in international software development projects.

7.7 Financial Development of the ICT Sector

7.7.1 Communications

Investment in fixed capital in the communications sector continues to grow. The Ukrainian State Statistics Committee reports a growth of 19.8 percent in fixed capital investment between the first nine months of 2005 and 2006.

Incomes from mobile services in the first ten months of 2006 were 49.5% up on the same period in the previous year, while fixed services (urban, rural and long-distance) decreased by a little over one percent. This decrease was mainly due to a decline of 6 percent of the largest part of that market, long distance and international telephony.

Revenue from the telecommunications market from January – September of 2006 can be broken down as follows:[167]

- Urban telephone network services – 2086,8 million UAH (338.6 million Euro);
- Rural telephone services – 162,1 million UAH (26.3 million Euro);
- Long distance & international – 4657,5 million UAH (755.8 million Euro);
- Mobile services – 14279,4 million UAH (2317 million Euro).

7.7.2 Information Technology

No Ukrainian companies have made a significant impact on the international technology industry. Siemens, Ericsson and Nokia are leading suppliers of network equipment for the fixed and mobile markets.

With an estimated total turnover of 450 million US$ (372 million Euro) in computer hardware sales and 125 million US$ (103 million Euro) in ICT services, the information technology industry is comparatively small. The industry provides ICT products and services through several distinct economic activities, including consulting services, software development, data processing, database development, technical support and repair, and other computer-related services. The most common IT activities include: enterprise resource planning, customer relationship management software, specialised management and accounting software, antivirus software, e-commerce applications, and industry-specific solutions.

[167] State Statistics Committee of Ukraine

According to the Ukrainian Association of Software Developers (UASWD),[168] over 1,300 legal entities are engaged in activities connected with software development, production, and distribution with another 900 companies involved in the import, assembly, distribution, and support of computer hardware. Multinational companies now reflect a much larger percentage of the industry, representing approximately 60 percent. Local registered firms make up about 30 percent of the market, and the remaining 10 percent comprises small, shadow market groups working primarily on small offshore orders for software development.

Proportion of companies involved in Ukrainian IT services and product export market, 2005[169]

Large and midsize commercial companies	30-45%
Software development centres of international vendors	5%
Small companies (fewer than 15 persons), independent groups of programmers, individual developers	25-35%
Note: representative sample is declared to be 50%. Many outsourcing companies do not declare themselves on domestic market. Complex ownership structures makes ownership and company identification difficult.	15-40%

The IT industry in Ukraine complains about a range of structural problems that prevents it from developing further. These include competitiveness problems cause by low-cost Russian imports, an alleged lack of government leadership to prioritise and support the sector, and inadequate infrastructure.

[168] http://www.uaswd.org.ua/en

[169] Estimate by QArea. Their full report on software development in Kharkiv is available from: http://www.qarea.com/articles_pages/article5/article-details.php

Political Intelligence

INTERNEWS

Armenia

Local Expert: David Sandukhchyan

Table of Contents

1 OVERVIEW 4
1.1 Regulation of Electronic Communications 4
1.2 Regulation of Electronic Services 5
1.3 Use of Information and Communications Technologies 5
2 GENERAL ENVIRONMENT 7
2.1 Influence of Stakeholders on Regulation and Policy 7
2.2 National Development Plan 8
2.3 Data Protection 8
2.4 Cybercrime and Spam 9
3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 11
3.1 Interconnection 11
3.2 Numbering 13
3.3 Rights of Way and Facilities Sharing/Collocation 14
3.4 Tariff Policy 14
3.5 Cost Accounting 16
3.6 Universal Service 16
3.7 Local Loop Unbundling 16
3.8 Leased Lines 18
3.9 Mobile Services 20
3.10 Satellite Services 21
3.11 Status of the National Regulatory Authority (NRA) 22
3.12 Licensing and Authorisation 23
3.13 Spectrum 24
4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 26
4.1 Digital Signatures 26
4.2 Payment Systems 26
5 USE OF ELECTRONIC COMMUNICATIONS SERVICES 28
5.1 Fixed Telephony Penetration 28
5.2 Mobile Usage 28
5.3 Cable Services 28
5.4 Computer Availability 29
5.5 Internet Access 29
5.6 Public Internet Access Points (PIAPs) 30
5.7 Wireless Internet Access 30
6 AVAILABILITY OF ONLINE SERVICES 31

6.1 E-Commerce 31
6.2 E-Government 32
6.3 E-Health 32
6.4 E-Learning 33
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY 35
7.1 Fixed Networks 35
7.2 Mobile Operators 36
7.3 Cable Networks 36
7.4 Internet Access Providers 36
7.5 Satellite Operators 36
7.6 Production of IT Services 37
7.7 Financial Development of the ICT Sector 37

1 OVERVIEW

The current independent Armenian state was declared in 1990 and officially established in the following year. It has a population of 3 million people and covers a land mass of 29,700 square kilometres. The GNI per capita was 926 Euro in 2005, based on World Bank figures. The government is a presidential democratic republic, with eleven constituent parts (ten provinces and the capital, Yerevan).

Armenia recently introduced a new legal and regulatory framework for electronic communication, which is partially in line with European regulatory principles. However, the incumbent operator still possesses exclusive rights on provision of basic telecommunication services, and competition is allowed only in a small segment of the market. The country's telecommunications infrastructure is not well developed and requires significant investment. In spite of advanced e-payment systems operated by local companies, the level of e-commerce development is not very advanced due to the high cost of telecommunication services, as well as due to some tax and custom legislation barriers. E-government is at early development stage and is not well-coordinated at national level. Audiovisual policy in Armenia is mostly in line with European standards.

1.1 Regulation of Electronic Communications

Under the new Law on Electronic Communications (2005), the Public Services Regulation Commission (PSRC), which was already responsible for regulation of electricity and water supplies, has taken over as the independent NRA.

According to the Law on Electronic Communication, interconnection offers should be made public. The only interconnection agreement signed so far is the one between the incumbent and second mobile operator and this has never been made public. The recent creation of an independent NRA should help bring transparency to the relationships between market players and improve competition, but so far no positive changes have been recorded in regulation of interconnection.

Until the end of 2005, numbering resources were managed by the incumbent with nominal oversight by the Ministry of Transport and Communications. The new NRA has now taken over responsibility for numbering management. Number portability is not available.

Clear rules on collocation and facilities sharing are absent, with the incumbent able to cite lack of technical capacity to reject any request. That said, limited technical capacity is a real issue in many instances. On the other hand, in spite of absence of LLU regulation, some unbundling, for the purpose of Internet access provision, does take place.

The completion of tariff rebalancing is planned for 2010. Cost accounting is being demanded of the incumbent and should be implemented by the end of 2007, at the latest. Details of the cost accounting methodology are yet to be decided.

The new Law on Electronic Communications introduces a universal service concept, although the details of how this is going to be implemented remain unclear.

The costing methodology for leased line provisioning remains a problem. The larger ISPs also report problems with obtaining lines.

Progress has been made in recent years with regard to the simplification of licensing procedures, especially for ISPs. However, the new licensing rules recently adopted by the NRA will most probably result in additional difficulties and expenses for the operators of data transmission networks (most ISPs). The annual cost of a network operation licence has been significantly increased. Moreover, additional expenses will be incurred for the certification of network equipment and preparation of a detailed network development plan.

Basic data protection legislation is in line with EU law, although the issue of sanctions is unclear, as there is no data protection authority and there is a lack of clarity regarding the transfer of personal data abroad.

1.2 Regulation of Electronic Services

The recently adopted law on digital signatures appears to cover all the main areas regulated by the equivalent EU legislation, although there is limited experience as yet of how this is working in practice.

For an Internet hosting or service provider to be held liable for illegal content under Armenian law, it would have to be shown that the company was guilty of gross negligence. No monitoring is required of access or hosting providers.

Online payments systems are very advanced in Armenia. Worthy of note are the ArCa system, which allows the online payment of utility bills (and has been extended to other online services and retailers) and e-dram, which is a prepaid scratch card system used for making small purchases online.

Online infringements of intellectual property rights have not received a great degree of attention so far in Armenia. Similarly, there are some question marks regarding the extent to which rules concerning online child abuse images are sufficiently comprehensive.

1.3 Use of Information and Communications Technologies

The low level of competition in the fixed and, until very recently, mobile markets in Armenia, has had a negative effect on the availability of services. Fixed line penetration

is currently 19.7 percent[1] with a very significant urban-rural divide; mobile penetration stands at a little over 21.9 percent.[2] With only one provider on the market until 2005, demand has outstripped supply for mobile phone services in Armenia. However, the introduction of competition in the mobile market in 2005 already appears to have resulted in an increasing penetration rate.

The cost of a 420 Euro computer as a percentage of annual salary is one of the highest among the countries in this study (36 percent[3]). This, coupled with a comparatively low level of fixed line penetration, gives rise to a low level of Internet usage, calculated as being 7.5 percent[4] in 2005. Very few businesses have an online presence: a random selection of one hundred companies from the Armenian Yellow Pages undertaken for this report in 2005 found that only three had websites.

As regards e-government, there has been general progress regarding provision of information on websites (as with the other countries in the study). Notably however, an innovative "e-visa"[5] service has been launched for visitors entering Armenia through the capital's main airport, and further "e-consulate" services are in the pipeline.

[1] From OTE's 2005 Second Quarter Report and the State Commission on the Protection of Economic Competition. It is worthy of note that Armentel's reporting of its own statistics is significantly different from that of its parent company – the difference being over 18 percent for 2004 data (Armentel's figures being the higher of the two). See http://www.armentel.com/eng/fix/

[2] This data was received from sources in the two mobile operators and date from late 2005.

[3] Based on statistics for January-September 2005 from the Armenian National Statistical Agency.

[4] From http://www.internetworldstats.com

[5] http://www.armeniaforeignministry.com/eVisa/

2 GENERAL ENVIRONMENT

2.1 Influence of Stakeholders on Regulation and Policy

To date, apart from the incumbent, the IT and telecommunications industry in Armenia has not seriously influenced either state policy or the regulatory process. Most of the policy and regulatory changes have been the result of negotiations between the incumbent and the Ministry of Transport and Communication; usually, the interests of other market participants are not directly taken into account. At the same time, the reason for the lack of influence of the telecommunications industry (as well as other industries) also lies in the fact that industry groupings are not yet sufficiently organised for the promotion of joint interests at legislative and regulatory levels. Attempts to establish ISP associations have failed due to industry disagreements about the aims and governing structure that such an organisation should have.

In 2001, a group representing approximately 20 different IT businesses (mainly software companies, hardware producers and vendors, but also including ISPs) founded the Union of Information Technology Enterprises (UITE),[6] which is the only grouping of IT and telecommunications companies in Armenia. However, UITE has a diverse membership and does not focus on the problems and failings of telecommunications regulation. The main interests of UITE are hardware trade policy (taxation and customs payments) and general issues relating to manufacturing, such as outsourcing, labour legislation, income tax policy and social security obligations. Copyright legislation is also among the interests of UITE members.

One of the oldest associations in the sector is the Armenian Internet Society,[7] which brings together users and businesses. The Society is not actively involved in lobbying for either users' or ISPs' interests, although it often makes public statements and occasionally publishes comments on specific issues of telecoms policy. For instance, the Society has made several statements concerning the quality of Internet services and the accessibility of Internet services for the rural population. During the last five or six years, the Society has increasingly been influenced by ISP interests, with the interests of users becoming less prominent.

In 2001, the Government created the IT Development Supporting Council (ITDSC),[8] an advisory body involving representatives of IT businesses, public officials and civil society groups. The purpose of ITDSC is to provide a platform for communication between the various stakeholders. In spite of its limited resources and authority, ITDSC has managed to raise the profile of various issues in the area of telecoms policy and regulation. In 2003, for example, ITDSC promoted policy and legislation changes aimed at simplifying ISP licensing procedures and the introduction of class licensing (simplified licensing) for service providers. In 2004, ITDSC successfully initiated the liberalisation of the 2.4 GHz spectrum range. However, as with UITE, the diverse membership (hardware providers, ISPs, academic and not-for-profit organisations) significantly decreases the efficiency of

[6] http://www.uite.org/

[7] http://www.isoc.am/, which is part of the international Internet Society (http://www.isoc.org)

[8] http://www.itdsc.am/home

the Council. Several initiatives have not been supported by all members and thus the ITDSC failed to present a common opinion to the Government, which weakened the recommendations put forward. For instance, no common agreement was reached on ITDSC initiatives to develop recommendations to foster e-Government. The ITDSC also failed to establish a common opinion concerning recommendations on the implementation of Government policy in the area of IT and the information society.

There are no administrative barriers to the setting up of trade associations in Armenia.

2.2 National Development Plan

In June 2001, the Armenian government announced ICT as a priority for the country's economic development and adopted a Concept Paper outlining general information society development aims. The Concept Paper does not provide specific guidelines, but provides direction, such as relating to the creation of favourable conditions for the development of IT businesses, fostering the use of IT in public administration, ensuring the inclusion of relevant subjects in university curricula, etc.

Concrete steps towards further developing the Concept Paper have been hampered by a number of factors, the central one being the lack of resources of the main implementing body, the ICT Development Supporting Council (which was established at the same time the Concept Paper was adopted, see above), and insufficient coordination of the activities of the different ministries in the area of IT policy development and in the implementation of IT related initiatives. There was some competition between the ministries in the coalition government for the supervision of the IT sector, which substantially harmed the development of a unified government policy in this area.

The "E-Armenia" initiative was eventually launched in 2003. This contains many of the provisions in the Concept Paper. However, progress towards implementing the E-Armenia proposals was interrupted by parliamentary elections in 2003 and Presidential elections in 2004, and little progress has been made on re-launching either initiative since then.

2.3 Data Protection

The Law of the Republic of Armenia on Personal Data was adopted in 2002. The law defines the legal status of personal data, as well as general rules for obtaining, storing and processing personal data. In general, the law complies with the principles outlined in the Council of Europe Convention on the Protection of Individuals with regard to the Automatic Processing of Personal Data as well as the relevant European Directives (European Parliament and Council Directives 2002/58/EC and 95/46/EC). Contrary to EU practice, there are limited sanctions in the event of breaches. Moreover, the Armenian data protection law does not foresee the establishment of a specialised,

national data protection authority nor has it delegated responsibility over the supervision of data protection to a particular governmental institution.

Obligations to protect customer information were incorporated into the incumbent's licence during its revision in 2004. According to current legislation on telecommunications, operators and service providers must ensure the confidentiality of data and information transmitted through their networks and terminal equipment.

The Law of the Republic of Armenia On Personal Data does not include a section limiting the transfer of personal data abroad. The relevant section of the Law was removed during the most recent revision of the law (May 23 2006).

2.4 Cybercrime and Spam

Armenia has signed (in 2001) and ratified (in 2006) the Council of Europe Cybercrime Convention and signed (2003) and ratified (in 2005) the Optional Protocol of the Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography in 2005. The criminal code was updated to give the conventions practical effect.

According to the Law on Mass Media (2003), the publication of any kind of pornographic material in the mass media (which is defined as information of public interest published, broadcast or made available for a non-defined number of users via the public communications network) is prohibited. The definition of mass media in Armenia also extends to the online world; however only "*Internet web sites that contain news and information of public interest*" are classified as mass media. In other words, pornographic websites are not classified as mass media and therefore the restrictions on pornography under the Mass Media Law are not applicable.

Article 263 of the Armenian Criminal Code contains provisions against the *"illegal [i.e. directly prohibited by law] production of pornographic material, its dissemination, and storage for further dissemination.*" However, there is no specific law regulating the production and sale or dissemination of pornographic content. Therefore, the only restrictions on pornographic content are in the Mass Media Law and Law on Television and Radio (and as explained above, there is a caveat for web-based pornography). As a result, officially, the electronic publication of pornography is legal, whilst it is illegal via television and the press. The maximum penalty defined under the relevant article of the Criminal Code is imprisonment for up to two years.

There have, however, been at least two criminal cases over the last three years related to the dissemination of pornographic materials on the Internet and the people who were charged for the "*illegal dissemination of pornography*" were penalised one hundred thousand Armenian Drams (200 Euro).

ISPs and companies providing web-hosting services are not obliged to monitor the content of transmitted and stored content. However, on request from law enforcement bodies, they must block transmission and access to content for the prevention of crime. ISPs are not held liable for illegal material, if they have no knowledge of it.

There are no active anti-piracy organisations in Armenia and the only collective rights management organisation does not appear interested in online IPR infringements.

The regulation of unsolicited electronic communications has not been addressed in Armenia and is not considered to be a priority issue.

3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS

3.1 Interconnection

The regulation of interconnection is currently based on the Law on Electronic Communications, which was adopted on 8 July 2005. This new law was developed with technical assistance from USAID and the World Bank, and the final version included many of the recommendations of the World Bank, the ITU and other international organisations. Although the law contains some liberal communications market elements (for instance, the establishment of an independent regulatory authority), the regulation is not fully in line with EU telecommunications legislation. For example, the law maintains the exclusive right of the incumbent to provide a wide range of services (fixed voice telephony, for example), in accordance with the licence granted in 1997 and revised in 2004.

The Law provides only general principles of interconnection between the operators of public telecommunications networks. The main principles include:

- "Every-to-every" Principle. This means that interconnection should be provided to ensure that every user of one interconnected network can communicate with any user of another interconnected network;
- "From-point-to-point" Principle. This means that every interconnected operator should be able to provide services to subscribers of other interconnected networks;
- Every public telecommunications network operator should provide interconnection to any other operator on request;
- Interconnected operators should hold mutual responsibility for the establishment of interconnection within a reasonable timeframe.

Specific interconnection conditions are to be defined in commercial interconnection agreements, which should be approved by the National Regulatory Authority.

A reference interconnect offer is required by the new legislation. However, only a minimal amount of information regarding what needs to be included in the RIO is defined by the Law. Non-dominant operators are not obliged to publish a RIO, but may file a public offer for interconnection with the NRA if they so wish. At time of writing, in November, 2006, Armentel's RIO had not yet been published.

In addition to the Law on Communications, interconnection in Armenia is also regulated by Armentel's licence conditions. According to the incumbent's licence, Armentel is obliged to meet all reasonable requirements regarding interconnection with its public switched network (PSTN) or cellular network as requested by other operators having authority to interconnect with these networks, provided that:

- The required interconnection is technically and economically feasible and does not contradict the provisions of the licence relating to Armentel's exclusive rights.
- The NRA has a right to intervene if the parties fail to come to an agreement; and

- No more than two points of interconnection with the new cellular network (i.e. K-Telecom) are requested in Yerevan and outside Yerevan, within one year after the second GSM licence has been granted.

Armentel retains exclusive rights to interconnection with foreign operators, excluding one-direction (downlink) connections with satellite service providers. According to the relevant provisions of the revised licence, "*the Licensee will have an exclusive right to sign contracts for the provision of such cross-border services that are within the scope of its exclusive rights, including basic telephony services, public mobile services and international data transmission and communications services (except satellite data reception).*" The most recent edition of Armentel's licence (2004) clarifies that the exclusive right to provide cross-border connections with foreign telecommunications operators means that local service providers cannot choose to connect with any foreign service provider, but that the contract with those providers should be signed through Armentel, which can then charge local operators and service providers for interconnection services. Since the licence was revised, one of the major Armenian ISPs has been interconnected with foreign operators according to the above described conditions.

Currently, the only interconnection agreement in place in Armenia is between Armentel and K-Telecom (mobile) and this is not public.

Neither carrier selection nor carrier preselection are available.

Two mobile operators are active on the market: one belongs to Armentel and the other, K-Telecom, is private. Armentel is the only fixed line operator.

Revenue sharing is not currently available for ISPs. Furthermore, according to Armentel's licence, "*data service providers using licensed data networks cannot request interconnection with the public switched network of the Licensee during the period of rebalancing [i.e. from the date of the last revision of the licence to the date of its next review, i.e. from 2004 to 2009]; instead, they may interconnect with the data network of the Licensee*". However, in reality, Armentel does not yet have such a data network. This provision also stems the rollout of VoIP services in Armenia which can only be provided legally by the incumbent.

Armentel has successfully taken action against VoIP providers originating or terminating international voice calls on its network, on the basis of this being a breach of the exclusive rights awarded via its licence. However, the large Armenian Diaspora, together with the comparatively high costs of terminating calls on the Armentel network, suggest there will be continuing demand for such VoIP services. During the last year, the volume of unauthorised VoIP termination was reduced due to a change in the international calls termination policy of the incumbent and the more rigorous enforcement of sanctions by the NRA for contraventions of the incumbent's exclusive rights. According to NRA representatives, some unauthorised termination continues, but this does not have a significant impact on the market.

The current call termination rate for mobile-to-fixed and fixed-to-mobile calls is 0.022 US$ / 0.18 Euro. The mobile-to-mobile call termination rate is 0.065 US$ / 0.0537 Euro during peak times and 0.045 US$/ 0.0371 Euro off peak.

3.1.1 Competition dispute

The new mobile provider K-Telecom made a formal complaint to the competition authority SCPEC (State Committee for the Protection of Economic Competition) to complain about the abuse of a dominant position by Armentel, which offered its mobile subscribers a 95 percent discount for calling other Armentel mobile subscribers *and* Armentel fixed line subscribers (the retail price thereby being a small fraction of the termination rates offered to K-Telecom). Armentel was subsequently fined 1 percent of its turnover. However, in the process of the investigation, SCPEC also designated K-Telecom as having significant market power, as it now has over half of the mobile market.

Parallel with its complaint to the SCPEC, K-Telecom had filed a further complaint to the PSRC (the NRA) regarding Armentel's anti-competitive practices and breach of licence conditions. In this case, the NRA also found in K-Telecom's favour. However, the NRA did not apply any sanctions and only asked the two parties to submit suggestions to resolve the dispute. This raises some obvious questions regarding whether the new NRA has the tools necessary to effectively intervene in disputes involving the incumbent operator.

3.2 Numbering

Since the adoption of the Law on Electronic Communications in July 2005, responsibility for numbering policy and the allocation of numbers has been transferred to the National Regulatory Authority from Armentel. The NRA is now in the process of developing numbering allocation rules. According to the new law, the National Regulatory Authority must adopt rules on the allocation of numbers on a non-discriminatory basis. One case has already emerged under the new legal framework that has resulted in competing ISPs being entitled to use nationwide access numbers for dial-up services on an equal footing with the incumbent's ISP.

Various non-geographic services, such as freephone and premium rate, are available. However, prices for premium rate services are high and therefore usage is very low and prohibitive for uses such as revenue sharing for ISPs. In other words, revenue sharing is possible in theory but not in practice.

As Armentel has a monopoly on the provision of fixed services, fixed number portability is not an issue. Mobile number portability is not available.

VoIP providers do not currently have any rights to national numbering resources (whether geographic or non-geographic numbers) and it could be difficult for them to gain access to the numbering plan in the future in view of Armentel's licence conditions. Armentel has kept a tight grip over the development of VoIP services and only private deployments are currently possible.

3.3 Rights of Way and Facilities Sharing/Collocation

Currently, neither the Law nor the incumbent's licence contain clear regulations on either facilities sharing or the collocation of terminal equipment. Some ISPs have managed to build their networks using the incumbent's facilities due to good personal relationships with Armentel's management; however, the issue of the presence of network cables of alternative service providers is occasionally questioned by the incumbent's administration. Collocation was used in the past but, during the last three years, the incumbent has refused to provide space for the placing of service providers' equipment on its premises and has terminated some of the collocation agreements previously signed, basing the decision on the lack of technical capacity.

According to the 2005 Law on Electronic Communications, dominant operators must provide line facilities sharing opportunities and collocation unless the technical capacity of facilities is not "sufficient", or unless the facilities are "necessary" for the incumbent's infrastructure for the next three years. According to the Law, the capacity of the incumbent's line facilities and technical premises are subject to inspection and assessment by the National Regulatory Authority. Moreover, the NRA can assess the incumbent's infrastructure development plans to inform its decision on line facilities sharing and collocation of equipment. However, no provisions are in place to enable the NRA to gauge whether Armentel actually fulfils these network expansion plans. The NRA's task is also made difficult by the fact that the term "necessary" is not defined in the Law and its meaning is therefore unclear.

3.4 Tariff Policy

According to the 2005 Law on Electronic Communications, the National Regulatory Authority (Public Services Regulation Commission – PSRC) shall be responsible for the regulation of tariffs for telecommunications services. The legislation says that "*tariffs should be fair and reasonable.*" The Law also states that when defining tariffs, the NRA should take into account public interest and support for competition. However, the Law does not provide more specific rules on the methodology for tariff calculation, although the NRA is required to publish its methodology publicly (no methodology has yet been published). Tariffs of non-dominant service providers may also be regulated if the public interest requires such regulation. The Law does not specify which specific public interests would give grounds for the regulation of tariffs for services offered by non-dominant service providers. On the other hand, according to the Law, the NRA has no right to regulate non-dominant providers of Internet services.

According to Section 6.A.4 of Armentel's revised licence, tariffs for basic telecommunications services, including local and international telephone services, must be rebalanced before 1 January 2010. If the incumbent fails to rebalance its tariffs for basic telecommunications services, it must notify the NRA without delay so that the parties can endeavour to reach a mutually acceptable resolution, including the drafting of a revised timetable for liberalisation and rebalancing, universal service funding and mechanisms to ensure a return on investment for the licensee. Non-compliance with

tariff rebalancing requirements could lead to a revision of the incumbent's tariffs by the NRA and the volume of subsidies to be paid to the universal service fund.

If the parties do not reach a mutually acceptable resolution within 270 days after receipt of the incumbent's notice, each of the parties may initiate the dispute resolution procedure in accordance with relevant provisions of the licence (Section 14.B.2). A final decision on the dispute should be made by the courts of the Republic of Armenia.

The main cause of conflict between the Government and the incumbent over the last three years has been the introduction of call-metering tariffs, which, according to the Government, was not justified due to insufficient investments made by the incumbent and the poor quality of telecommunications services more generally (criticisms were mainly aimed at the incumbent's provision of mobile services and access to international data transmission services).

According to the revised edition of the incumbent's licence, the Licensee is obliged to file proposed tariff adjustments with the Regulator on the basis of appropriate cost estimations on an annual basis. The adjusted tariffs should be calculated in accordance with a cost calculation methodology which the incumbent must adopt by 1 January 2008 after the approval of the NRA. These rules are applicable to basic telecommunication services i.e.:

a) Connection fees consisting of charges for installation and connection of residential and business subscribers to the public switched network.
b) Basic monthly fees per telephone line for residential and business subscribers, including a maximum duration or number of local toll-free calls, where applicable.
c) Metered (per minute) charges based on duration and time of day in excess of the maximum local toll-free call amounts.
d) Charges for the basic domestic long distance telephone service based on duration, destination, time of day, and day of week.
e) Charges for use of telephone line for Internet access service based on duration, time of day and day of week.

There is some discrepancy between Article 31 of the Law on Electronic Communication and Armentel's Licence. According to paragraph 1 of Article 31 of the Law on Electronic Communication, the NRA must establish a cost accounting system for dominant operators and service providers. The system should be cost-based and provide the NRA with an opportunity to assess the cost of each service provided by an operator or service provider. The same Article states that the NRA must define a cost calculation methodology and relevant accounting method. However, Armentel's Licence gives this responsibility to the incumbent. Nonetheless, NRA representatives think that this is not a major problem as it can use the existing rules to ensure the implementation of an appropriate methodology.

In short, the legal framework for tariff rebalancing is basically in place in Armenia, although its full implementation will take several years. Progress is expected to improve once an accounting methodology is published by the NRA.

3.5 Cost Accounting

Armentel has only recently been required to introduce cost accounting mechanisms. According to the 2005 Law on Electronic Communications, the National Regulatory Authority is responsible for regulating the cost of universal services as well as the services provided by operators with significant market power. The NRA is also tasked with ensuring cost orientation of the prices charged for these services. The 2005 Law states that the NRA should define and adopt the methodology for the calculation of universal service costs and ensure the transparency of that methodology. The methodology has not yet been drawn up but is understood to be a priority issue for the new NRA. It is expected that this cost accounting mechanism will be implemented by 1 January 2008. (Please also refer to the section above on tariff policy).

3.6 Universal Service

For the first time in Armenia, the concept of universal service has been included in national law through the Law on Electronic Communications, which was developed with technical assistance from USAID and the World Bank. This Law provides general principles concerning the regulation of universal services: the regulatory authority is given substantial power to define the scope of universal services, the obligations of universal service providers, rules on the provision of universal services, and the methodology for the calculation of the cost of universal services. The NRA (the PSRC) is responsible for defining the rate of payments that operators and service providers should transfer to the universal service fund and for developing a methodology to compensate service provider losses for the provision of universal services.

The general universal service principles adopted in Armenia state that when determining the services to fall under universal service obligations, the NRA should take into account the public benefit to be had and the most effective technological solutions. The availability of public telephone services for the *majority* of the population is mentioned as one of the key objectives of universal service. The law does not contain specific references to the need to ensure the availability of public telecommunications services to a particular category of citizens (e.g. disabled users, rural population, etc.).

In short, the key set of services to be provided and target beneficiaries of universal service are yet to be clearly defined.

Due to reported problems with premium rate services, Armentel has introduced selective call barring services, although these are only available from digital switches.

3.7 Local Loop Unbundling

Consideration of access to the incumbent's copper network has begun to take place in Armenia, even though liberalisation is at a very early stage. The concept of access to

the network and local loop unbundling in Armenian telecommunications legislation differs significantly from internationally accepted approaches. According to the 2005 Law on Electronic Communications, any network operator with significant market power must provide “point-to-point” connection, including last mile connection, for the exclusive use of the alternative service provider. In other words, the provision of the line is considered to include both point-to-point connection and the lease of the last mile copper pairs for the exclusive use of service providers. Local loop unbundling has been implemented in this manner (referred to as “dedicated lines”) in Armenia since the time of privatisation. However, in practice, LLU is not readily available. Although the incumbent is required to provide full access to the local loop, lines are not interconnected to the PSTN.

The price of these dedicated lines is approved by the NRA.

ISP complaints about the selective and non-transparent provision of local loops by the incumbent are very common. The incumbent regularly rejects applications from ISPs based on “insufficient technical capacity of its network.” Indeed, the incumbent’s licence contains provisions that enable it to opt out of its various obligations related to the provision of exclusive services by citing technical incapacity. There are not yet any mechanisms in place to ensure that the incumbent does not cite insufficient technical capacity simply to abuse the system. However, it should be noted that Armentel’s network, partly due to under-investment, is in fact not wholly suited to allowing LLU. According to ISPs, technical capacity for LLU is not available in 10 percent of Yerevan’s network, and in 50 percent of networks elsewhere. ISPs hope that Armentel’s scope for avoiding its LLU obligations will be narrowed by the NRA’s interpretation of the Law on Electronic Communications, as the LLU applicant will have the right to ask the Public Services Regulation Authority to inspect the incumbent’s technical capacity. In cases of rejection of requests for “dedicated lines” on the basis of lack of collocation space, the NRA can verify if this is the case and make a ruling. Provision of collocation space automatically entails the provision of other necessary services, such as electricity.

Armentel moved to halt the provision of local loops for ISPs completely in February 2006, when it sought authorisation from the NRA to do so, on the basis that these lines caused interference with other lines, that ISDN services were already available to competitors, and that Armentel could provide xDSL services to end users. This request was rejected by the NRA.

ISPs have been campaigning for shared access but there appears to be little government support for the introduction of the necessary legislation to achieve this. The new Law does introduce some changes to facilitate shared access and collocation, but it does not fully facilitate access to the local loop as enshrined in EU legislation, as it does not directly consider LLU as such, but rather only allows for collocation in the context of leased lines and facilities sharing. Indeed, the term LLU is not actually employed in the law.

As the new NRA has been in operation for a comparatively short amount of time, it is not yet clear how effective it will be in ensuring competition in the “last mile.”

3.8 Leased Lines

The supply of leased line services has always been an incumbent operator obligation in Armenia. However, although both the original and reviewed licences require the incumbent to provide leased line services on a transparent and non-discriminatory basis, there are several key complaints from communications providers relating to the selective provision of leased lines services and alleged frequent refusals of applications by the incumbent, which are formally justified by citing the network's lack of technical capacity. Unconfirmed claims from ISPs suggest that this "selective" practice is mostly due to Armentel's desire to restrict competition from the larger ISPs (as Armentel is aware of ISPs' need for leased lines to develop their services). Nevertheless, according to Armenian ISPs, the situation has significantly improved and leased line services are now provided by Armentel on relatively equal basis. In addition, the major Armenian ISPs have constructed their own infrastructure (optical cables covering central part and commercially attractive areas of the capital city).

Tariffs for leased line services are subject to approval by the NRA in accordance with general cost calculation methodology applicable to electronic communications. The methodology should be developed and published by the NRA by 1 January 2008 and enforcement should start from that day.

The costs for leased lines are grouped into zones. The speeds available for leased lines are 64 kbps, 128 kbps and 2048 kbps. The table below outlines as an example of the cost for 2048 kbps leased lines:

Cost for 2048 kbps Leased Lines

Circuit length by zones, km	Monthly tariff (with VAT)
I zone (0-25)	600 US$ / 496 Euro
II zone (26-50)	960 US$ / 793 Euro
III zone (51-100)	1.680 US$ / 1,388 Euro
IV zone (101-200)	2.580 US$ /2,132Euro
V zone (201 and more)	2.760 US$ / 2,280 Euro

According to the incumbent's licence, Armentel is obliged to install and utilise the sufficient capacity necessary to meet current and future demand in the market for "point-to-point" data transmission leased line services through the incumbent's network (including ports) and accompanying equipment.

The speeds available on the market usually depend on the geographic area, but the basic speed is 2048 kb/sec (E1). There is no clear public policy aimed at improving the speed of leased lines and the development of the network. Relevant obligations defined in the Licence refer to the construction of "*20,000 digital channels- kilometres*" in five years after the first revision of the Licence, i.e. before 2003. The incumbent has reported on compliance with that requirement, but the official view regarding the degree of compliance has not been made public. Moreover, ISPs frequently complain that there is not enough capacity.

Detailed regulation of the provision of leased line services is also now prescribed under the 2005 Law on Electronic Communications. According to Article 35 of the Law, within 45 days of receipt of the application requesting leased line services, the incumbent should have satisfied lawful and properly documented requests (the incumbent's licence also specifies the same timeframe). In cases of faults on a leased line, the incumbent should seek to repair the line within three days of notification. This can be compared with Armentel's licence provisions which state that repairs have to be done in a "reasonable" but unspecified timeframe.

Specific regulations regarding technical terms, conditions and fees have not been developed yet by the NRA, a deadline for completion of this work was not set by the Law on Electronic Communications.

Under the Law on Electronic Communications, the operators of public telecommunications networks and service providers are required to file all leased line agreements with the NRA for the purpose of mapping out the existing leased line capacity of the incumbent and other operators.

According to the formula for the calculation of international leased circuits that was approved in 2005 by the Ministry of Transport and Communication, three types of leased circuits are offered by Armentel:

- A connection between any point of Armentel's network in the national territory and the border of the country via the Trans-Armenian optical backbone;
- A "part" of the connection between any point in Armentel's network and a selected foreign operator. It is assumed that the second part of the connection is provided by the foreign operator in cooperation with Armentel, but the payment for the connection provided by the foreign operator will be paid to that operator directly by the Armenian alternative operator;
- A complete connection with the foreign operator, arranged by Armentel. In such cases, Armentel will act on behalf of the Armenian service provider and will also charge an intermediary fee.

According to Internet service providers, the approval of tariffs for cross-border connections is one the main achievements in Internet policy in recent years, although many of them are still concerned about the high tariffs for leased lines services provided by Armentel within the territory of the Republic of Armenia. So far, no contracts for leased line international circuits between ISPs and the incumbent have been concluded and it is too soon to say how effective and robust the procedure defined by the Ministry of Transport and Communication will be. The IP optical backbone has only two international connections, partly due to regional political difficulties. Technical or physical problems with this backbone, as have occurred over the past two years, create problems for IP connectivity nationally.

The incumbent has a right to prevent traffic originating from the data service provider and terminating on the incumbent's public switched network in order to protect its exclusive rights to provide basic telephone services, as defined in its licence.

3.9 Mobile Services

Up until July 2005, the only mobile service provider was Armentel,[9] the fixed line incumbent. In July 2005, a second provider, K-Telecom[10] (using the brand name Vivacell), entered the market. No 3G licences have been issued and there are also no MVNOs.

In a relatively short period of time (the last six months of 2005), K-Telecom (VivaCell) has acquired over half the mobile market in Armenia. According to data the operators submitted to the State Commission for the Protection of Economic Competition, 52.7 percent of mobile users are customers of K-Telecom (VivaCell) and 47.3 percent are clients of Armentel mobile services.

Prior to the launch of K-Telecom, the Armenian Internet Society collected statistics indicating that there were about 200,000 potential customers of mobile services in Yerevan alone and there would be approximately 100,000 more if the price of mobile services was reduced. As an indication of how demand is outstripping supply, the total capacity of Armentel's mobile network is 350,000. Thus, a third licence may be issued in 2009 to help meet demand.

No 3G services are currently available. In August 2006 Vivacell launched GPRS services available for post paid users. However, the high tariffs for GPRS services (0.25 – 0.5 Euro per Mb depending on tariff plan) means number of users is very limited (according to non-official data obtained from Vivacell managers approximately 10,000 users). Future 3G services will still be the monopoly of Armentel, as the revised licence refers specifically to the possibility of the introduction of an alternative GSM operator and not other mobile services. However, according to new edition of the incumbent's licence if the licensee (Armentel) does not have intention to use its exclusive right to provide a particular service, the NRA may grant that rights on non-exclusive basis to other companies.

Armentel offers a sign-up fee of 12 Euro for prepaid and 9.5 Euro for postpaid services (the latter also requires a 40 Euro deposit). There is no monthly fee for prepaid customers and a monthly 11 Euro fee for the first year, falling to 8 Euro in the second year, for postpaid customers. Fixed line rental, by comparison is 2.3 Euro per month. Mobile to fixed calls cost 0.16 Euro/min (peak) and 0.8 Euro/min (off-peak) for prepaid and 0.10 Euro/min for postpaid services, and SMS messages cost 0.04 Euro and 0.03 Euro respectively. Tariffs offered by Vivacell are similar to Armentel's tariffs: 0.18 Euro/min (peak hours) and 0.17 (off peak) for prepaid services, and 0.11 Euro/min (peak hours) and 0.09 (off peak hours) for post paid services. Sign-up fee for VIvaCell's prepaid services is 12.5 Euro and Cost of SMS is 0.04 Euro.

Armentel reports a coverage rate of 59 percent of the territory of Armenia and 88 percent of the population. Vivacell does has not published any figures, but its coverage is broadly similar to that of Armentel.

[9] http://www.armentel.com/eng/index.php

[10] http://www.vivacell.am/

3.10 Satellite Services

Satellite services are relatively well developed in Armenia, but market demand for the services is not very high due to the high cost compared with disposable income. Internet services are usually used by ISPs; only a few end-users (mainly companies) use satellite services for Internet connection. Home users avail of satellite services almost exclusively for television. Due to the fragmented nature and relative newness of the market, there are no reliable statistics available with regard to the market share of satellite services.

There are at least three resellers of IP downlink services offered by satellite service providers. The services are limited to downlink channel access to the Internet and usually do not include television services. Satellite television services are usually offered by other companies, which do not offer Internet access services.

Downlink satellite services are widely used by ISPs in the capital city and rural areas as the only reasonable means of supplying Internet services to their customers without rolling out their own networks. The number of downlink connections used by companies and households is gradually increasing, but is still very limited due to the high installation cost (about 290 Euro).

In February, 2006, the Internet Society, together with one of the largest ISPs, took a case to the State Commission for the Protection of Economic Competition to require Armentel to provide satellite services for ISPs. The case was successful although, as it was only decided in summer 2006, the full ramifications are, as yet, unclear. In line with the decision of State Commission, Armentel has filed an interconnection offer for an Internet uplink satellite service, but so far no agreement was signed between. ISPs and Armentel on provision of interconnection services on the basis of that offer. One of the main barriers that ISPs faced prior to conclusion of interconnection agreement for uplink satellite services is the cost of allocation of frequencies, certification of satellite equipment and obtaining permission for operation of satellite antenna. The approximate cost of all of the abovementioned formalities is about 5,000 Euro and only two major ISPs could afford it. When using satellite services, ISPs have the choice between using Armentel and, therefore, the satellite provider it uses (Teleglobe) or selecting a different satellite provider and installing its own equipment (which nonetheless has to be operated by Armentel, due to its exclusive licence for international circuits).

Armentel uses satellite as a back-up for its optical backbone. However, the capacity available is far from sufficient for it to fulfil this role adequately.

Use of “two-way” data transmission channels (uplink/downlink) is extremely limited due to legal restrictions. Uplink satellite connection is used only by companies and universities for private networks not interconnected with the public telecommunication network.

The number of subscribers to satellite television channels is also increasing, but the vast majority of television audiences view free-to-air television channels.

3.11 Status of the National Regulatory Authority (NRA)

The Public Services Regulation Commission (PSRC), which was established in November 2003, took on the role of NRA for telecommunications in line with the new Law on Electronic Communications in 2006. The PSRC was previously responsible for the regulation of electricity and water supply services and the supply of energy and fuel. The PSRC did not take charge of telecoms issues initially because it was thought that the Commission would first need to build up its experience in order to regulate this market.

The Commissioners are appointed by the President of the Republic of Armenia, upon nomination by the Prime Minister, according to an annual rotation principle (a new Commissioner is appointed each year). The Commissioners are expected to act independently from the Government and National Assembly. The experience of the markets previously under the competence of the regulator is generally positive in this respect.

The Commission is generally considered to have substantial financial independence and sufficient operational resources. The Law on the establishment of the Public Services Regulation Commission contains detailed provisions concerning the mechanisms for the funding of the Commission. According to the Law, the regulated entities (licensees) must pay an annual licensing fee related to the tariffs of supplied services. The total amount in licence fees paid to the national budget by licensees should not be less than the annual budget of the Commission.

The Commission is staffed with specialists from professions such as financial services, accounting and law. If necessary, the Commission can employ external experts and consultants on a short- or long-term basis. International and foreign organisations such as USAID are already focusing resources on the Commission’s activities, and thus the Commission receives substantial technical and monetary assistance.

There are wide-ranging restrictions on the activities of the Commissioners to minimise the possibility of corruption, such as not being allowed to own shares in the regulated entities or be involved in other remunerated (with some carefully defined exceptions) activities.

The Commission has a right to undertake, and regularly carries out (as seen in the area of energy and water supply), consultations with industry and consumer associations, as well as other public, private and civil society organisations. Consultation with market participants and other interested parties is based on formal procedures adopted by the regulator. The consultations are usually public and announced by the NRA in advance. However, individual stakeholder meetings are also held by NRA commissioners and staff members and there is no regulation governing the procedure for individual meetings between NRA authorities and market participants. Nevertheless, so far, no issues have arisen relating to these bilateral meetings and the possible pressure being exerted by a particular party behind closed doors.

According to the Law on Electronic Communications, the Commission is required to develop and enforce a package of important regulations, including: criteria for licence

holders and their reporting standards; standards for cost accounting and archive keeping; quality of service; and cost calculation standards for the incumbent and operators/service providers with significant market power. The Commission is also responsible for:

- The classification of services and networks;
- The assignment of frequencies, in accordance with the National Spectrum Plan;
- The assignment of geographic and non-geographic numbers in accordance with the National Numbering Plan;
- The resolution of disputes between market participants;
- SMP designations;
- The inspection of licensee activities; and
- The protection of consumers' rights.

The main procedures and principles for the operation of the Commission are defined by the Law on Electronic Communications, but the Commission can also adopt procedural documents as appropriate.

The Law on Electronic Communications introduces a completely new approach to the regulation of the telecommunications industry in Armenia. For instance, the Law defines some of the terms and principles for dispute resolution by the Commission. In particular, according to Article 3(3) of the Law, the Commission must provide disputing parties with an opportunity to submit oral or written justifications/explanations for their interests or demands. The Commission acts as the official arbitration body for disputing operators and service providers. The Law also specifically sets out principles for the resolution of interconnection disputes.

The Ministry for Transport and Communications retains control of development of the Frequency Allocation Plan, and definition of standards for and certification of telecommunications equipment. However, since the adoption of the Law on Electronic Communication, the Frequency Allocation Plan has not been developed.

In the first months of operation of the NRA in the communications sector, there appear to be few problems. With regard to timetables for disputes, the NRA has ten days to process initial complaints and the company that is the subject of the complaint has ten days thereafter to respond. After 20 days, the NRA organises hearings with the relevant parties before it reaches its decision.

3.12 Licensing and Authorisation

The Armenian Government has developed a policy aimed at decreasing the number of business activities requiring mandatory licensing in order to remove unnecessary barriers for businesses. Over the last five years, the Armenian Government has introduced some changes to licensing policy in the area of information and telecommunications services. In 2003, the production of telecommunications equipment was taken off the list of activities subject to mandatory licensing. In the same year, the Government decided to amend the law on Internet service providers' licensing procedures: ISPs no longer have to apply for individual licences, but can apply for more

general, “class” licences (i.e. the ISP can apply for a generic, rather than a company specific, licence).

There are three types of licence, a generic “network” licence, a licence for the provision of electronic communications services and a licence for radio frequencies.

Network licences are granted through a complicated procedure which includes the assessment of the applicant’s technical capacity and plans, and the qualifications of personnel – the time, cost and complexity of these procedures have been frequently criticised by ISPs. Similarly, the radio frequencies licence requires assessment of technical capacity and compliance with technical standards, etc. The licence for electronic communications service provision simply requires a formal application and the procedure normally takes about ten days.

In 2005, the Armenian Government also introduced regulatory changes so that individuals and businesses would no longer be obliged to gain permission for the use of the 2.4GHz frequency for the exploitation of wireless networks on that frequency (Wi-Fi).

The price (including state duty) of licences is affordable even for newly established businesses and varies from a one-off cost of approximately 200 Euro for ISPs to approximately 2,000 Euro for voice telephony service providers (the latter fee was established in the expectation that the exclusive rights of Armentel can be reduced after Vimpelcom takes over 90% of the company from OTE. This licence is not yet available, at time of writing, in December 2006). After the liberalisation of the Wi-Fi band, and in view of the rapid growth of this technology in Armenia, the total amount of state duties paid by ISPs to the state budget was significantly reduced.

According to the amended Law on Payment Processing Systems and Payment Processing Organisations, which entered into force in October 2005, the operation of and technical support services for electronic payment systems such as credit cards and web cash systems are also subject to licensing. The process involved is inexpensive and, as long as innovative services (such as e-Dram) are not impeded by the new legislation, this should not have a major impact on the market.

3.13 Spectrum

In Armenia, spectrum management is still at a basic stage of development. The NRA has only limited powers in the field of spectrum management and can only offer non-binding recommendations to the Ministry. The PSRC is responsible for the allocation of frequencies following policies set by the Ministry. The National Spectrum Plan, the national strategy with regard to spectrum, and the type and certification of equipment that can be used, remain under the authority of the Ministry of Transport and Communications. The NRA’s role is solely to assign spectrum to applicants in accordance with the National Spectrum Plan. Thus, although the NRA has the power to revoke spectrum rights, such decisions will have to be made taking into account information received from the Ministry, which is in charge of monitoring and inspecting use.

The NRA is responsible for publishing a list of frequencies that have been assigned, as well as specifying what the spectrum is being used for and to whom the spectrum has been assigned. It is also responsible for publishing details of calls for tender for spectrum in the event of limited resources being allocated in a particular region as well as the procedures for applying to use the frequency. According to Article 17 of the Law on Electronic Communications, the NRA must adopt rules on the use of radio frequencies, define procedures for the allocation of radio frequencies, as well as technical, financial and legal requirements that applicants must meet when applying for allocation of radio frequency.

Wi-Fi technologies are booming in Armenia on the limited spectrum available and are becoming a real contender as an alternative to fixed-line services. The Armenian Government opened up the 2.4GHz frequency for public Wi-Fi use in 2005, which is considered a key step towards bolstering the Wi-Fi market.

There is concern among some industry players that the Ministry, which allegedly has shown little interest so far in spectrum liberalisation (although liberalisation was mentioned in the Concept for the Development of Telecommunications in Armenia in 2004), retains control of activities in this field that would normally be provided by an NRA.

Only the 2.4GHz frequency range is available for public use, and only if the transmitting device uses a power source of less than 100mW.

Similar to the procedures for licensing a telecommunications network, the process of frequency allocation takes long time and is very expensive. According to representatives of companies that that already obtained permission for the use of transmitting (uplink) satellite antenna, the cost of frequency allocation comparable with the cost of the equipment and can take several months.

4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES

4.1 Digital Signatures

The Law of the Republic of Armenia on Digital Documents and Digital Signatures was adopted by the National Assembly in January 2005. The Law was drafted taking into account the main principles of the regulation of electronic signatures outlined in the EU Digital Signatures Directive,[11] such as the voluntary accreditation of certification service providers, free circulation of e-signature products, and encouragement of competition amongst service providers and technologies.

Provisions for the accreditation of certification service providers and the requirements for electronic signature creation devices are almost identical to the relevant provisions of the e-signatures Directive. The main differences between the EU e-signatures Directive and the Armenian e-signature law are not conceptual; they are caused by different legal traditions and approaches towards the regulation.

According to the Armenian e-signature law, certification service providers are liable for any damages that may arise due to negligence. The law also sets out requirements relating to the financial capacity of the accredited certificate service providers and the examination of that capacity by the accrediting authority. The law allows certificate service providers to indicate ceilings on the value of transactions for which a particular certificate can be used, and limits service providers' liability for the damage exceeding that value.

One of the main problems that the Armenian government faced with the implementation of the Law on Electronic Document and Electronic Signature is the lack of expertise in defining the accreditation criteria. Relevant implementing regulations were adopted only partially: the government decision on accreditation procedures was adopted, but the accreditation criteria are still under the discussion.

4.2 Payment Systems

There are three different types of electronic payment system in Armenia. The most advanced one is run under the Armenian Card (ArCa) credit card system.[12] ArCa is the leading, local credit payment system in Armenia. ArCa was developed with support from USAID and is operated by the ArCa Joint Stock Company, which was established by the largest Armenian banks. The online interface for ArCa credit cards, which allows for online payments, was developed with financial support from the UN Development Programme and was launched in 2003. The system was initially used only for the online payment of public utility bills (such as electricity bills) and was later integrated into the

[11] European Parliament and the Council 1999/93/EC Directive on a Community Framework for Electronic Signatures (e-signatures Directive)

[12] http://www.arca.am/eng/

web sites of ISPs, computer equipment sellers and some web shops. It was felt that this gradual rollout would help encourage the take-up of the service (bearing in mind distance selling is still a very new concept in Armenia).

The second payment system in operation in Armenia is the E-Dram[13] prepaid cards system, which is used exclusively for online transactions. E-Dram clients are usually young people who do not have bank accounts, but use e-commerce for making relatively small transactions (e.g. the purchasing of Internet services, computer accessories, digital music, etc.). Once the simple online registration process has been completed, a customer's E-Dram account can be topped up in various ways.

From a legal point of view, the E-Dram system is a cash payment obligation issued in the form of prepaid cards or a sort of intermediary financial service. It is not considered to be a banking service, because E-Dram does not actually accumulate the client's money nor does it manage it – it just provides a payment mechanism used by vendors and their clients for the virtual transfer of money. The final payment is made through a bank.

According to the amended law on Payment Processing Systems and Payment Processing (2005), the organisation, operation and support of electronic payment systems is subject to a licensing requirement. Two of major operators of electronic payment systems (ArCa and E-Dram) have obtained licences, although the E-Dram system was transferred to Armenian Post JSC and now operates under its licence.

The third payment system, using international credit cards such as Visa and MasterCard, is not yet as prevalent in online payment market, but accepted by many companies for offline transactions payments.

[13] http://www.edram.am

5 USE OF ELECTRONIC COMMUNICATIONS SERVICES

5.1 Fixed Telephony Penetration

The level of access to basic telephone services is quite high in Armenia due to a high-level of urbanisation. About 95 percent of households in the capital and 80 percent of households in other major cities (representing 30 percent of the total population) are connected to the public telephone network. According to the 2004 World Bank survey, about 79 percent of rural communities also have access to telecommunications services. However, this figure overestimates the actual level of residential access as, in many cases, the available access consists of a single telephone available either in the mayor's office or in the community post office. Moreover, in most cases, the quality of service is extremely poor and round-the-clock service is available in very few communities. Indeed, according to the abovementioned survey, even in the rural communities with the most developed infrastructure, only 30 percent of households have individual telephone connections. According to OTE, Armentel's parent company, teledensity was 19.7 percent[14] in the first half of 2005, up from 19.3 percent in 2004, 18.8 percent in 2003, 18.1 percent in 2002 and 17.9 percent in 2001[15]. According to the State Commission for the Protection of Economic Competition, the penetration rate in 2005 was 20%.

5.2 Mobile Usage

As of the first quarter of 2006, mobile penetration stands at over 21.9 percent.[16] A major increase in mobile ownership has come from the introduction of a second operator (Vivacell) into the market in mid-2005. It is worth pointing out, however, that, as with all countries in this study, the vast majority of mobile users have prepaid subscriptions. Therefore, many people are likely to have kept their prepaid Armencell SIM cards when switching to Vivacell, distorting the statistics to an extent that is not yet clear.

According to the 2004 World Bank survey, over 68 percent of rural communities are outside the area of mobile phone coverage.

5.3 Cable Services

Cable infrastructure is extremely underdeveloped in Armenia. Outside the capital, cable networks exist only in two cities and only reach around 10,000 people. Even in Yerevan, there is no citywide cable infrastructure; local area cable networks cover less than 5

[14] From OTE's 2005 Second Quarter Report

[15] The 2004, 2003, 2002 and 2001 figures come from the Armentel website http://www.armentel.am

[16] The data comes from published Armenian population figures and data from the two mobile operators

percent of the city (mainly the central commercial and governmental hub of the city). Cable networks are mainly used by ISPs for broadband connectivity.

Cable television, as an industry, hardly exists in Armenia and is limited to a few local areas where it is supplied by small providers that re-transmit satellite channels.

There are currently no major plans to extend or build cable networks in Armenia.

5.4 Computer Availability

The cost of computer equipment and connectivity is a serious obstacle for the development of the information society in Armenia. The average salary in the public sector is about 50 Euro per month and is about 125 Euro in the private sector. The cost of an Internet connection in Yerevan ranges from 20 to 35 Euro per month for a dial-up connection and from 60 to 100 Euro per month for a shared xDSL connection at 128 Mbps.

There are no official statistics on the number of personal computers per private household in Armenia, but according to the survey carried out by the Armenian Internet Society in 2002, it was estimated that there were around 1.5 - 2 computers per 100 households.

.

5.5 Internet Access

Although Internet service provision is adequate in urban areas, in rural areas access to electronic communications services is restricted by the absence of infrastructure and service providers. Rural markets are not attractive for major Internet service providers due to the limited number of users and poor infrastructure. According to the 2004 World Bank survey, rural Internet access is very low, with only 7 percent of rural communities having access to Internet services, and usually only at public access points established with the assistance of international organisations.

Dial-up access through Arminco[17] costs 16,000AMD (29.06 Euro) per month (for unlimited, anytime access), while unlimited off-peak surfing costs 8,000AMD (14.53 Euro) per month. There is little price difference between urban and rural areas.

Dial-up costs approximately 2.8 Euro for 10 hours, 6.5 Euro for 25 hours, 13.3 Euro for 50 hours, and 25 Euro for 100 hours.

ADSL from Arminco, using a shared connection (100kbps to 2gbps) costs 50,000AMD (108 Euro) per month with a traffic limit of 2 Gb; additional traffic is charged at 12 AMD (0.02 Euro).

[17] http://www.arminco.com/

A World Bank survey in June 2005 indicated that 60,000 households in Armenia were connected to the Internet, while informal estimates from ISPs and the Internet Society suggest that approximately 5-6 percent of the population use the Internet regularly, mainly through dial-up. ISPs blame the slow growth on lack of efficient unbundling and high international bandwidth costs.

The precarious nature of Armenia's access to the Internet was shown on 5 and 6 August, 2006, when the country's connection was disrupted. E-mail services were restored via satellite backup and full service was restored when Armentel rerouted its traffic (details are not available, although the presumption is that this was via Turkey).

5.6 Public Internet Access Points (PIAPs)

The 2004 Evaluation Report[18] on three Information Society Projects reported very active use of the PIAPs that had been set up in Armenia with support of the UNDP. At the time the report was published, PIAPs had been set up in most of the nine target regions, although significant issues regarding the availability of broadband were reported.

5.7 Wireless Internet Access

According to the Armenian Internet Society, 5 percent of connections in Armenia are wireless.[19] Use of wireless broadband connections in urban areas is limited due to the high price. Wireless broadband connections are mainly used in Armenia by businesses and public institutions. They are also used in rural areas where the infrastructure is under-developed and wireless connection is the only possible means of Internet access. During the second half of 2006, the number of commercial Wi-Fi Internet access points increased significantly and cover almost entire territory of the capital city. However, according to ISPs that provide public Wi-Fi access services, the number of users of such services is very limited.

[18] Evaluation Report of UNDP Armenia ICT-for-Development Programme: e-Governance System for Territorial Administrations (ARM/02/012); Support to Information Society and Democratic Governance (ARM/01/001); International Assistance Database for Armenia (ARM/99/005), David Sandukhchyan and Yuri Misnikov. The report can be downloaded from:

http://www.ict.am/pr_images/ICTD%20Evaluation%20Report.pdf

[19] This information is based on discussions between the authors and the Internet Society

6 AVAILABILITY OF ONLINE SERVICES

6.1 E-Commerce

The majority of small and medium-sized businesses and households connected to the Internet in Armenia use dial-up Internet connections and only a few businesses and households are connected using xDSL technology. Use of xDSL connections is limited due to the high cost of equipment and connection.

There are still very few businesses that have their own web pages or who use online tools for their daily operations or for communication and sales with customers. According to a test sample of 100 companies taken from the Armenian business yellow pages,[20] only 3 percent of enterprises have websites.

Although the Armenian Government declared IT as one of the priorities for the country's economic development in 2001, very few concrete measures were taken to realise significant progress, further to the policy document that was published.[21]

Armenia is one of the few NIS countries to have a national electronic payment system: the Armenian Card (ArCa[22]) credit card, which is an authorised third party processing centre for the international VISA and MasterCard systems. Despite the existence of the ArCa electronic payment system however, the number of full-fledged e-commerce services is limited to a few e-shops and ISP services. Nevertheless, all public utilities in Armenia can already be paid for online through the ArCa payment system. In October 2005, ArCa introduced an e-transfer system providing customers with the opportunity to transfer money from one account to another.

According to representatives of the Union of IT Enterprises,[23] there is considerable need for the promotion of e-commerce methods though the education of company managers as well as the general public, who are still not sufficiently aware of new business methods. IT marketing professionals maintain that even the current comparatively small Internet audience should be sufficient to move businesses online, but traditional businesses do not yet appreciate the benefits of e-commerce.

A few initiatives aimed at promoting ICT use by businesses and at encouraging the population to use electronic commerce have been launched and funded by foreign donor organisations such as USAID, the UNDP and some private foundations. No Armenian governmental programmes have been initiated to foster electronic commerce and ICT take-up.

[20] As part of research conducted for this study.

[21] "Concept of the Development of Communications in Armenia"

[22] http://www.arca.am/

[23] http://uite.org/

6.2 E-Government

Armenia is just starting to develop e-Government resources and still does not have a coherent strategy in place to provide the Government and public institutions with guidelines for the creation of its web resources. An e-government strategy is planned for adoption before the end of 2006. A draft e-government strategy was developed with the support of European experts within the framework of Tacis EU-funded project and was submitted to the government in July 2006.

Some very effective e-governance tools have been developed with the support of international organisations, due to the enthusiasm of individual Government officials. One of the most successful examples of e-government in Armenia is the e-visa system, which was introduced by the Ministry of Foreign Affairs three years ago.[24]

Most Armenian ministries and regional Government authorities have websites, although these are infrequently updated. Most governmental web resources contain general information about the institution; only some include news items. Very few governmental websites have communications and interactive tools (and these are often limited to e-mail communications). The Government's website[25] contains government decisions, cabinet minutes and press releases. However, significant progress has been made recently to create an online legal database. Part-funded by the USAID, the legal database of the National Assembly[26] contains details of existing laws and draft laws under discussion. An online legal database operated by the "Official Bulletin" state-owned JSC was created in 2006 within the framework of the World Bank justice reforms loan program.

An important joint initiative between the Government of Armenia and the European Commission falls within the e-governance component of the IT Support to Armenia Project.[27] The project is aimed at the development and introduction of a pilot system for electronic document circulation and web content generation, a computer program allowing hierarchical multi-user access to website publications. The web content generation tool will enable the Government to decentralise the web publication process and provide each department with the opportunity of publishing their content directly.

6.3 E-Health

The doctor.am website provides a very extensive service for medical staff, giving access to medical journals, software, details of Armenian diagnostic centres, non-profit organisations as well as other key online resources for medical practitioners in Armenia.

[24] Information on the e-visa system can be found at http://www.armeniaforeignministry.am/eVisa/

[25] http://www.gov.am/

[26] http://www.parliament.am/En

[27] The project does not currently have a website. The website for the Armenian ministry leading the project is: http://www.armeniaforeignministry.am

Other e-health resources in Armenia are the Armenian Bone Marrow Registry[28] and the Armenian Medical Association.[29]

6.4 E-Learning

According to the Armenian office of the Open Society Institute, approximately one quarter of Armenian schools are connected to the Internet. The number of computers in school computer centres usually varies from 4 to 20, depending on the size of the school. Schools usually connect to the Internet via an xDSL or wireless broadband connection.

Most state-funded universities are connected to the Internet, but computer equipment is in short supply. Most Yerevan-based universities are connected to the Internet using broadband connections (fibre optic cable), which were constructed with financial support from the Open Society Institute. Some colleges and universities in other cities use broadband connectivity, some are connected via dial-up, but many of them are not connected to the Internet at all due to the lack of financial resources or the absence of affordable Internet services in a particular city/district. Internet connectivity in Armenian universities and other higher education institutions has significantly improved due to the financial and technical assistance of NATO's Virtual Silk Highway project,[30] the Open Society Institute[31] and the UNDP[32].

Efforts to promote e-learning have come from outside the Armenian government, with considerable resources being donated from international organisations. One of the best known is Project Harmony,[33] which has worked to increase school connectivity, promoting access to, and the sharing of, information, and the development of technical skills.

During his participation at the World Summit on the Information Society in 2005, the Armenian President expressed his intention to ensure that all schools in the country would be connected to the Internet within three years.[34] In addition, a European Commission project on "Creating e-Societies in the Southern Caucasus", started in September 2005 and is due to last for two years. This includes a significant e-learning aspect.

The NREN (the Armenian Research and Educational Network - ARENA[35]) provides satellite Internet connectivity for educational and scientific institutions. It plays an important role in terms of providing not-for-profit educational institutions with reliable and cheap Internet connectivity. However, the efficiency of ARENA is limited due to

[28] http://www.abmdr.am/

[29] http://www.armeda.am/

[30] See http://www.silkproject.org/

[31] See http://www.soros.org/

[32] See http://www.undp.org/

[33] http://www.projectharmony.am

[34] President Kocharian participates in World Summit on Information Societies in Geneva, Armenian Foreign Ministry, 11 December 2005. http://www.armeniaforeignministry.am/PR/PR303.html

[35] http://www.arena.am/

underdeveloped infrastructure and most of the beneficiaries of NREN connectivity are located in the capital city. Currently, ARENA’s capacity is 4Mbps downlink and 1Mbps uplink, which supplies universities and research institutes in Yerevan.

7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY

7.1 Fixed Networks

Armenia was one of the first of the Newly Independent States to privatise its telecommunications industry. Most telecommunications companies in Armenia are owned by either private persons or private companies. In 1994, 49 percent of the incumbent telecommunications operator, Armenia Telecommunications Company (Armentel JSC),[36] was privatised and acquired by Trans World Telecom (TWT), which is purportedly an American-owned telecommunications firm. Very little is known about the first phase of Armentel's privatisation. In 1997, 90 percent of the incumbent's shares, including most of those owned by the Armenian Government, were sold to OTE, the Greek incumbent operator. The other 10 percent of the incumbent's shares are still owned by the Government of Armenia, which means there is a Special Representative of the Government, appointed by the Prime Minister, on Armentel's Board of Directors.

In June 2006, OTE decided to sell its shares in Armentel and announced an open tender for the purchase for 90% of its shares. After a six month evaluation of commercial offers submitted by two Russian and one United Arab Emirates company, the Russian company VimpelCom was announced as the winner. The press offices of Armentel and VimplelCom have announced the intention of the companies to sign a share sale-purchase agreement, which is currently (December, 2006) being negotiated by the companies' representatives. The Armenian government announced that it also going to sell its 10% of Armentel shares if the new owner will agree to abolish monopoly on main telecommunication services. However, there is not much information yet about the possible elimination of the company's exclusive rights from the licence.

The incumbent telecommunications operator owns the main telecommunications infrastructure including the Trans-Armenian Optical System (optical backbone), satellite antennae, the entire fixed telephone infrastructure (PSTN), and most of the country's mobile telephone infrastructure (with approximately 85 percent geographic coverage).

Armenia's second mobile telephone company, K-Telecom, is owned by a private company which, according to unofficial information, belongs to a citizen of Lebanon.

The Government also owns the main television transmission and re-transmission system, the Republic Television Network JSC (RTN). RTN is a closed joint stock company; meanting that its shares are not traded on the securities market. The company possesses significant infrastructure including broadcasting towers, satellite antennae, microwave networks and television transmission repeaters. RTN owns a satellite channel, which is used for satellite broadcasting of Armenian public television.

[36] http://www.armentel.com/eng/index.php

7.2 Mobile Operators

There are two mobile operators on the Armenian market, Armentel (at the time of writing the Greek incumbent OTE owns 90 percent, and the Armenian government 10 percent), and K-Telecom (trading under the name "Vivacell")[37], which is reportedly owned by Pier Fatush, a Lebanese businessman.

7.3 Cable Networks

Cable networks in Armenia are generally very small and do not offer services beyond analogue TV access.

7.4 Internet Access Providers

The major Internet Service Providers (ISPs) are owned by Armenian citizens, but there are some companies that are co-owned by foreign citizens or companies. For example, Arminco,[38] one of the leading ISP companies, is co-owned by a Russian company (although it does not have a majority shareholding). of the largest ISPs are registered as Limited Liability Companies (LLC) with an average capital of approximately 200,000 Euro. There are numerous small ISPs (about 100) supplying Internet services to a small number (normally ranging from two to ten) of large companies or a certain geographic area (e.g. a block of flats).[39] However, the number of these small companies is decreasing due to strong competition in the Internet market and recently introduced high licence fees and state duties, which has led to increasing consolidation.

So far, Armentel has not had an interest in entering the Internet Services market. However, Armentel's launch into the ISP market has not been ruled out either, which is causing ISPs considerable concern.

7.5 Satellite Operators

As already discussed, according to the amended licence of the incumbent, Armentel must provide local ISPs and end users with interconnection with foreign service providers (via international leased circuit services) using either its own or a client's satellite equipment, if the ISP chooses this option. The service is supposed to be provided at the rate calculated in accordance with a formula that the incumbent has submitted to the National Regulatory Authority 60 days after the approval of the

[37] http://www.vivacell.am/

[38] http://www.arminco.com/

[39] The statistics in this paragraph come from a survey of ISPs carried out within the context of this study.

amended Licence. After a series of public discussions in July 2006 the National Regulatory Authority approved the formula for calculation of the cost of the international leased lines service and the relevant public offer. However, the cost of connection remains high (comparable with the cost of simply connecting to the incumbent's network) and so far only one ISP (WEB LLC) has signed agreement for an international terrestrial leased lines services. Two major ISPs (Arminco LLC and WEB LLC) are unofficially reported to be intending to build their own satellite equipment and operate it under an international leased lines agreement.

Another problem preventing the development of "two-way" satellite services in Armenia is the extremely high cost and administrative barriers for obtaining permission to import and use radio equipment. Depending on the type and transmitting capacity of the equipment, permission for importing, installating and using "two-way" satellite antennae, as well as the allocation of frequency, may cost as much as the equipment. The frequency allocation process is governed by the Rules on the Allocation of Radio Frequencies which was adopted by PSRC in March 2006. Even though these Rules significantly simplified frequency allocation procedures they still contain requirements for some sophisticated and expensive technical assessments. Moreover, the cost of registration and annual fee for the use of radio frequencies is so high that ISPs would have to increase their prices to avail of them.

7.6 Production of IT Services

Software and IT services represented 1.7% of Armenia's GDP in 2003.[40] Over the last few years, a number of IT companies, mainly in the area of software development and production, have been established in Armenia by local and foreign investors. Software companies are a major component of the Armenian IT industry. The bulk of the software design and production industry is owned by foreign investors, but operated by Armenian management. According to an assessment carried out by the Enterprise Incubator Foundation (EIF[41]) in 2004, investment in the Armenian IT industry stood at around about 10 million US$ (8.2 million Euro) and the annual estimated capacity of the IT industry in Armenia is estimated as being between 50-60 million US$ (41-49 million Euro). Armenian IT products (mainly software) are exported to over 20 countries including the USA and Canada (68%), Russia and the CIS (16%) and Europe (10%).

7.7 Financial Development of the ICT Sector

Over the last five years, a number of IT companies, mainly in the area of software development and production, have been established in Armenia by local and foreign investors. The contribution of the IT industry to Armenian GDP in 2004 was approximately 2 to 3 percent.

[40] Speech made by the President of Armenia to the World Summit on the Information Society, November, 2003

[41] The Enterprise Incubator Foundation was created by the Armenian government and World Bank to help support the development of information technology (SMEs) in Armenia. http://www.eif-it.com

According to the EIF survey, there are approximately 100 companies operating in the IT field in Armenia (software production, hardware production and trading, and Internet services) employing about 3,500 IT professionals (excluding Armentel employees).

The biggest employer in the area of telecommunications is the Armenian Telecommunications Company, which has a total of 5,500 employees.

The annual salary of experienced programmers in software production companies ranges from 3,000 US$ (2,479 Euro) to 7,200 US$ (5,950 Euro) per year, and the salary of project managers ranges from 6,000 US$ (4,958 Euro) to 14,000 US$ (11,570 Euro) per year. The average number of employees in IT companies ranges from 20 to 100 people in the software production industry and from 10 to 30 in the Internet service provider and telecommunications sector (excluding Armentel).

Political Intelligence

INTERNEWS

Azerbaijan

Local Expert: Yashar Hajiyev

Table of Contents

1 OVERVIEW 4
1.1 Regulation of Electronic Communications 4
1.2 Regulation of Electronic Services 5
1.3 Use of Information and Communications Technologies 5
2 GENERAL ENVIRONMENT 7
2.1 Influence of Stakeholders on Regulation and Policy 7
2.2 National Development Plan 8
2.3 Data Protection 8
2.4 Cybercrime and Spam 9
3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 11
3.1 Interconnection 11
3.2 Numbering 12
3.3 Rights of Way and Facilities Sharing/Collocation 12
3.4 Tariff Policy 12
3.5 Cost Accounting 13
3.6 Universal Service 13
3.7 Local Loop Unbundling 14
3.8 Leased Lines 14
3.9 Mobile Services 16
3.10 Satellite Services 17
3.11 Status of the National Regulatory Authority (NRA) 18
3.12 Licensing and Authorisation 20
3.13 Spectrum 20
4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 22
4.1 Digital Signatures 22
4.2 Payment Systems 23
5 USE OF ELECTRONIC COMMUNICATION SERVICES 24
5.1 Fixed Telephony Penetration 24
5.2 Mobile Usage 24
5.3 Cable Services 24
5.4 Computer Availability 25
5.5 Internet Access 25
5.6 Public Internet Access Points (PIAPs) 26
5.7 Wireless Internet Access 27
6 AVAILABILITY OF ONLINE SERVICES 28
6.1 E-Commerce 28

6.2 E-Government 29
6.3 E-Health 30
6.4 E-Learning 30
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY 32
7.1 Fixed Networks 33
7.2 Mobile Networks 34
7.3 Cable Networks 35
7.4 Internet Access Networks 35
7.5 Satellite Operators 35
7.6 Production of IT Services 37
7.7 Financial Development of the ICT Sector 39

1 OVERVIEW

The current independent state of Azerbaijan was established in 1991. It has a population of 8.5 million with a landmass of 86,600 square kilometres. The GNI per capita was 785 Euro in 2005, according to World Bank figures. The government is a presidential republic, with 65 provinces (*rayons)* 69 cities and one autonomous republic (Nakhichevan, which is divided into 7 provinces and one city).

Rapid economic growth (35-40% in 2006) in Azerbaijan is leading to more rapid take-up of new ICT services. Despite a relatively developed communications infrastructure in Azerbaijan, prices remain high, which is hindering development of the sector.

The slowness of reforms in the legal, regulatory and institutional spheres of the telecoms sector also limits its potential. Recently, an agreement was signed between the Azerbaijani Ministry of Communications and Information Technologies and the US Department of State on the creation of an independent regulatory body, which should help reform the existing regulatory system and ensure effective implementation of legislation, creating a more coherent framework for liberalisation.

1.1 Regulation of Electronic Communications

There is no independent National Regulatory Authority in Azerbaijan, although one is planned in the short to medium term. The basic regulatory functions are carried out by the Ministry of Communications and Information Technology (MCIT).

A new Law on Telecommunications was adopted in 2005, although this requires secondary legislation in order to be implemented properly.

Licensed operators are required to negotiate interconnection, with the courts able to impose settlements on the basis of the 1997 Communications Law, the 2005 Telecommunication Law, and other normative acts of MCIT.

There is neither local loop unbundling nor is there any immediate possibility of this being introduced.

The MCIT as a telecom regulatory body (Government) - controls numbering and the two state-owned fixed operators (BakTelekom and AzTelekom) have some informal privileged access to numbering resources. Some possibilities for number portability exist.

There is a firm obligation on communications providers to share infrastructure facilities, although there are no precise unified procedures detailed in legislation. In general, decisions regarding the sharing of facilities are made on the basis of individual negotiations.

There is an awareness of the need to rebalance tariffs; however, due to low income levels in the country, it is proving politically difficult to increase the fees for basic services. The special normative act on Implementation of Universal Services in

Azerbaijan was been adopted on 27 September 2005, however MCIT is still at the early stages of its implementation.

The MCIT uses a domestic system of cost accounting that, it asserts, is largely similar to the methodology used in other CIS countries. However, with no NRA and very limited competition, it is difficult to verify this.

There is limited regulation in the field of leased lines, with few obligations on the incumbents regarding leased line provision prescribed in the rules of the MCIT.

Licensing was greatly simplified in Azerbaijan in 2002, and licence fees are quite low (less than the equivalent of 5,000 Euro for most types).

There is no special national law on data protection, but its main aspects and provisions are reflected in various national laws. It appears that the Government is beginning to look at approximating those provisions with European norms and practice.

1.2 Regulation of Electronic Services

There are some concerns regarding the practical implementation of Azeri e-signatures and e-documents legislation, particularly with regard to how to regulate the activity of e-signature certification centres. The relevant normative act is expected at the beginning of 2007. However, there is very little experience of related legislation in practice, which is why MCIT is taking time to learn from the experience and practices of European countries, especially Estonia.

Issues related to the liability of intermediaries have yet to be fully addressed in Azeri legislation. There is ongoing work on further approximation of national intellectual property legislation with international norms, with the EU experience in the online world being particularly significant, The rules concerning online child abuse images are comprehensive.

1.3 Use of Information and Communications Technologies

There has been sustained growth in both the fixed and mobile sectors, although the fixed sector suffers from a significant urban-rural divide. Mobile penetration is currently at 26.8%,[1] while fixed is only 13 percent.[2] Internet penetration (based on individuals who connected to the Internet in the previous two weeks), based on 2005 figures, is growing quickly, reaching 8% in 2005.[3] Local assembly of computers in Azerbaijan means that computers are somewhat cheaper than in other countries in the study, costing

[1] Based on 'Communication of Azerbaijan' Statistical Yearbook (for 2005)
[2] Data from TeliaSonera, Q2 2005 Report
[3] Official report of Ministry of Communication and Information Technologies made at the International ICN exhibition Bakutel-2006

approximately 350 Euro and equating to around 25 percent of the average annual wage.[4]

In order to achieve the targets set out in the State Programme on Computerisation in Schools, a special computer factory has been set up. There are three further commercial PC manufacturers in Azerbaijan.

Despite relatively low Internet penetration levels compared with European statistics and some unsolved obstacles created by the incomplete reform of the legal framework, there are efforts to launch electronic commerce services in the country.

The National e-Governance Network Initiative, signed in June 2004, aims to improve communication between government and citizens, creating government information centres across the six regions of the country as well as establishing government information portals.

Azerbaijan's score rose from 2.42 (out of 10) to 2.72 from 2004 to 2005 in the Economist e-readiness rankings, getting its best mark for business environment (5.29) and worst for consumer and business adoption (1.6). The score increased again in 2006, climbing to 2.92, with business environment increasing to 5.54 and consumer and business adoption increasing to 1.80.

[4] Based on wage data from the National Statistics Agency.

2 GENERAL ENVIRONMENT

2.1 Influence of Stakeholders on Regulation and Policy

Several business associations involving telecoms providers are having an increasingly significant impact on national ICT policy development in Azerbaijan. This is manifesting itself through the introduction of progressive legislation that seeks to support the growth of ICT and through attempts to convince the Government to withdraw regulatory measures that risk stifling innovation or hindering the process of telecoms liberalisation and privatisation.

Annual business forums are held where representatives of business associations hold discussions with the President and Government representatives regarding the implementation of business-friendly reforms in national telecoms governance. For instance, at a 2003 forum, the then Communications Minister was subjected to strong criticism because of his regulatory policy, and this criticism is widely believed to have led to his subsequent dismissal at the beginning of 2004.

The Azerbaijan Internet Society (which is not part of the international Internet Society)[5] was established to build a coalition of Internet-related civil organisations, Internet communities, universities, academies and research institutes, and ICT stakeholders, in order to strengthen their ability to shape national ICT policy. The Internet Society lobbies for a comprehensive reform of Azerbaijan's ICT regulatory system and it holds wide-ranging dialogue with industry and Government officials, including officials from the MCIT and the incumbent operators, in order to seek mutually acceptable agreements on improving regulation, administration, licensing, certification, tariffs, telecom liberalisation and the privatisation policies of the MCIT and other Ministries. The Internet Society is also very active with regard to the protection of Internet users' rights.

The Azerbaijan ISP Association (AzISPA) was created as an informal grouping, and is now an effective coalition of more than twelve commercial and two state-owned Internet Service Providers, as well as several ICT-related businesses. AzISPA is committed to providing legal, political, and administrative assistance to ISPs, campaigning against alleged anti-competitive practices of the monopoly telecoms operators with regard to the terms and conditions of ISP access to the Internet. AzISPA is also committed to developing united policies and positions on crucial aspects of state policy affecting ISPs. Specifically, AzISPA has called for transparency and simplicity in the licensing and certification requirements of ICT operators and with regard to interconnection rules, and advocates explicit procedures for liberalisation and privatisation in the telecoms market.

Certain international groups have consistently made efforts to approach MCIT to explain the steps that they believe are required to enhance the Azeri communications market, and the use of ICT in business more generally, through suitable regulation (the American Chamber of Commerce in Azerbaijan (AMCHAM), the Commercial Service of the US Embassy in Azerbaijan,[6] the UK and German Embassies, and the Turkish

[5] http://www.isoc.org

[6] http://www.ustrade.gov

Industrialists' and Businessmen's Association[7] are some examples). For instance, AMCHAM[8] supports and monitors the implementation of the procedures and regulation needed for the liberalisation of the market and the creation of new telecom providers (including Voice over IP and mobile providers), in order to ensure fair conditions and open competition for all entities operating within the ICT area.

The official registration of associations is carried out by the Ministry of Justice in accordance with the National Law on Legal Persons Registration. Flaws in several provisions of the Law enable administrative officials in the Ministry of Justice to delay – and in some cases even to refuse – the registration of associations, especially NGOs and Joint Ventures.

2.2 National Development Plan

The National Information and Communications Technology Strategy for the Development of the Republic of Azerbaijan (2003-2012) was launched by the President in February 2003 and was developed in cooperation with the UNDP. The primary aims of the Strategy include assisting with democratic development, improving national communications infrastructure, information security (including data protection) and international links, developing e-Government and e-Learning and ensuring favourable conditions for the transition to a knowledge-based civil society by 2011.

The Strategy assesses the country's strengths and weaknesses as well as the most appropriate role for the State in leading ICT sector development. To this end, it identified the development of ICT awareness, transparency, equality, innovation and international cooperation, taking the lead in the implementation of ICT tools, and the development of national information resources as the key areas where the State could play a role.

While some progress has been made in certain aspects of the Strategy (such as the adoption of new legislation on telecommunications), few measures have been taken that specifically address priority issues identified in the overall strategy, and no well-defined procedure is in place to measure progress towards long-term goals.

Additionally, the Electronic Azerbaijan Plan (2005-2008) was launched in 2005 with the specific aim of bringing ICT up to EU levels within 3 years. Internal government evaluations of work to date are reported to be positive.

2.3 Data Protection

The possibility of ratifying the Council of Europe Convention on the Automatic Processing of Personal Data is currently under discussion among the relevant ministries. The Azerbaijani government regards data protection as a serious issue and the creation of a national information security system will be developed in the framework

[7] http://www.tusiad.org/indexeng.htm

[8] http://www.amchamaz.org/

of the forthcoming State Program on the Development of ICT in Azerbaijan. For the moment, however, there is no specific national law on protection of personal data, the data protection requirements are scattered over provisions of the national constitution and several laws. This creates obvious difficulties in harmonising national law with the relevant EU and CoE norms.

The MCIT's Annual Report in 2005 referred to the need to improve the regulatory environment for e-commerce, which implies the need for improvements in data protection. However, no specific plans have been announced.

2.4 Cybercrime and Spam

Azerbaijan has neither signed nor ratified the Council of Europe Cybercrime Convention, but has signed and ratified the Optional Protocol of the Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography. Article 9 of the Cybercrime Convention, Article 34 of the UN Convention on the Rights of the Child and Article 7 of the Optional Protocol are applied through the relevant state authorities.

Azerbaijan has very strict child pornography legislation, which is in accordance with the requirements of many international conventions in this area. Relevant international law takes priority over national law, as with every aspect of Azeri legislation. Azerbaijan's constitution has provisions that make international conventions "self-executing" in domestic law. However, most domestic law regarding illegal content and access to information are stricter than international law dictates.

According to current legislation (the national laws on Communication (1997) and Information (1998) and the newly adopted Telecommunications Law) operators of telecommunications services are not obliged to bear responsibility for the information being sent over their telecommunication networks, until informed this is illegal.

Some deputies, in particular the Deputy Chairperson, (Mrs Bahar Muradova) of the National Parliament have proposed an initiative to set up a citizens' group that will run a national hotline to report illegal material such as copyright infringements and child pornography. This will be organised in conjunction with the Azerbaijan Internet Society. There are, however, no practical steps has been undertaken for Azerbaijan to establish procedures to accept reports of illegal material from other countries even when this has been assessed by national hotlines.

The process of adapting current national copyright laws in Azerbaijan to address relevant online issues is under way. Azerbaijan has not acceded to the WIPO Copyright Treaty or the WIPO Performance and Phonograms Treaty. However, in view of further adaptation of Azerbaijan to European norms, it will be necessary to bring national copyright legislation into line with the requirements of European legislation.

The two key pieces of cyber-security legislation in Azerbaijan are the Law on National Security from 29 June 2004 and the Law on the Protection of unsanctioned Information Collection of 14 September 2004. Chapter 30 of the Azerbaijan Criminal Code covers wide-ranging aspects of unauthorised access to, and breaches of the security of, computer systems, including the development and use of computer viruses.

The issue of unsolicited electronic communications has not been comprehensively addressed in Azerbaijan.

3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS

3.1 Interconnection

The 1997 Communications Law, the 1998 Information, Informatisation and the Protection of Information Law, and the 2005 Law on Telecommunications govern interconnection in Azerbaijan.

Tariffs (both retail and wholesale) of the state-owned operators (such as the two big operators Aztelekom and Baktelekom) are established and overseen by the Inter-Ministerial Tariff Council, acting under the supervision of the Ministry of Economic Development. Other commercial operators are able to set their own tariffs.

All telecoms operators are required to mutually facilitate interconnection. Formal commercial agreements are required for this purpose. If agreements cannot be reached, operators risk losing their licences and being forced to cease trading. In the absence of specific dispute settlement procedures, interconnection disputes are settled by the courts based on the 1997 Law on Communication, the 2005 Law on Telecommunications, and other Ministerial normative acts and regulations. The basic principle is that there should be no barriers to the use of the country's public communications infrastructure. The Ministry for Communications and Information Technology is expected to draft new secondary legislation regarding interconnection, as the 2005 Law on Communications sets out principles rather than procedures for facilitating interconnection.

There are five fixed line operators and three fixed CDMA operators. Commercial fixed line operators mostly operating on the Absheron Peninsula, fixed CDMA operators are broadening their network coverage also in other regions. This explains why fixed line interconnection is mostly concentrated on the Absheron Peninsula. Also, the major ISPs have developed their own infrastructure, including VSAT technologies. Revenue sharing is not available to dial-up ISPs.

According to the MCIT,[9] facilitating carrier selection/preselection is currently beyond the capabilities of the incumbents, Aztelekom and Baktelekom, and there are no special provisions for dealing with this issue in the 2005 Law on Telecommunications.

There are two GSM mobile operators, Azertel[10] and Bakcell,[11] both of which compete with the incumbent in data transmission. A third GSM operator Azerphone has only recently begun to establish its own network. The CDMA mobile operator Catel has relatively small client base.

In interviews undertaken for this research, MCIT indicated that it was seriously concerned that the increasing use of VoIP services was reducing income from outgoing international calls by at least 15 percent.

[9] Based on interviews undertaken for this project.
[10] http:// www.azercell.com
[11] http://www.bakcell.com

3.2 Numbering

Under the Law on Telecommunications, which was adopted by the Parliament and ratified by the President in June 2005, numbering is classified as a national resource. Numbering policy is managed by the MCIT, which is required to provide equal access to numbering resources. Specific rules on the management of this national resource are still under consideration, although it is expected that they will be published in the near future.

Number resources can be withdrawn if unused for two years after allocation and may only be sub-allocated or shared upon state approval.

Up until the new rules came into force, the two state-owned fixed-line operators had privileged access to numbering resources, while the mobile CDMA provider CATEL uses its own unique numbering system.

Number portability is available for both fixed and mobile services, to the extent that this is technically feasible. Only mobile portability is available free of charge.

3.3 Rights of Way and Facilities Sharing/Collocation

Despite the existing special regulation by MCIT there are no well-defined prescribed procedures for the sharing of operators' infrastructure facilities. Due to the lack of specific regulation, decisions regarding the sharing of facilities are mostly made on the basis of individual negotiations. However, as the majority of telecoms facilities are controlled by the State-owned operators, in most cases incumbents have obvious privileges. All appeals on this issue are made before a MCIT Board and State-owned operators are legally bound by any decision made in this regard.

There are no well-defined procedures for collocation, although the Law on Telecommunications has introduced general principles for the negotiation of collocation. It is expected that although the new law will allow owners of different networks to initiate collocation procedures, although the final approval of any decision will still remain with the MCIT.

The major private communications companies tend to prefer to build their own networks and minimise their technological dependence on the facilities of the incumbents.

3.4 Tariff Policy

The Inter-Ministerial Tariff Council sets the tariffs for all telecommunications services provided by state entities in Azerbaijan. The stated government goal in price regulation is to ensure a business-friendly environment, with prices based on costs and to restrict unfair competition. However, no publicly declared frameworks or timetables for tariff rebalancing have been established. The relatively low level of income earned by the

majority of the country's population makes it exceptionally difficult to significantly increase local call charges.

From time to time, MCIT initiates public discussions on implementing metering of local calls. However, this is always met by a very negative reaction from citizens, which makes it difficult on a political level to introduce change. Hence, to date, there has been no determined effort made to rebalance tariffs and there has therefore been little in the way of moves to reduce or eliminate price differences between local, regional and national calls, to reflect the actual cost of the service. However, there has been some reduction in the prices of regional and international rates recently: this is partly due to Government efforts at rebalancing and partly due to competition.

Local calls (even between different fixed operators) are free of charge and line rental remains very low (0.5 Euro per month). The cost of calls from mobile to fixed or vice versa are, by contrast, quite expensive at approximately 0.26 Euro per minute. Interregional fixed to fixed calls cost 0.09 Euro per minute.

The number of outgoing international call minutes as a percentage of incoming minutes decreased from 41 percent in 2001 to 24 percent in 2004. Outgoing calls from Azerbaijan cost 1.35 Manat (1.21 Euro) per minute for CIS states and Baltic countries; 2.70 Manat (2.41 Euro) for Turkey and Iran; 3.24 Manat (2.90 Euro) for European countries; and 4.32 Manat (3.86 Euro) for the USA

3.5 Cost Accounting

MCIT uses a domestic system of cost accounting that, it asserts, is largely similar to the methodology used in other CIS countries. The system was developed jointly by the MCIT and the MED. The oversight of this cost accounting system is carried out by the MCIT, so external verification of this model is not possible. It is the MCIT's view that the cost model has elements in common with EU cost models and is reasonably transparent and comprehensive. However, key elements of the model are not public and therefore this cannot be verified.

The most important tariffs for incumbents are set up Tariff Council, however there is no available information regarding the costing mechanism that is used by the incumbents (Aztelekom and Baktelekom) to determine pricing for access to key elements of their networks.

3.6 Universal Service

The MCIT has declared on numerous occasions that implementing universal service is a fundamental goal of Azerbaijan. This was outlined in the State Programme on the Development of ICT in Azerbaijan (which runs from 2005 to 2008) as well as the 2003 National ICT Strategy of Azerbaijan. Universal service is stated again as a key government policy in the 2005 Law on Telecommunications. The MCIT also has adopted a special ministerial regulation on Universal Services implementation.

However, further guidance is needed from the MCIT to detail the costing, implementation and administration of a universal service system.

All the main telephone companies already offer selective call barring services to customers.

Most of the obligations currently placed by the State on telecommunications service providers relate to ensuring the delivery of specified levels of quality of service.

In line with several other countries in this study, Azerbaijan has embarked on a focussed effort to increase basic access to communications in smaller towns and villages. Current plans are to ensure that:

- Settlements of 50-200 people be given access to local, inter-regional and international telephony services, access to information services (directory enquiries) and emergency services.
- Settlements of 200-1,000 people, in addition to the above, are to be given access to the Internet.
- Settlements of 1,000 to 10,000 people, in addition to the above, be given data transfer and fax services.

Unusually, these services are seen by government as a long-term investment for telecommunications companies. Therefore, they will be lent the money to develop these services and will have to repay this debt.

3.7 Local Loop Unbundling

LLU currently does not exist in theory or in practice in Azerbaijan. In order to mandate LLU, it would be necessary to enact specific legislative and technological provisions. It is expected that much of the legal basis for LLU will be determined according to the existing national ICT legal framework. In theory, the MCIT does have the power to require a change in any RUO that may be produced by the incumbent operators, if it deems this to be insufficient. Information relating to telephone exchanges is currently being gathered by the Global Internet Policy Initiative[12] in order to help promote competition.

The Law on Communications places obligations on the incumbent to create suitable conditions for the hosting of new entrant equipment. No other details on this area are contained in existing laws.

3.8 Leased Lines

The MCIT has yet to state publicly its approach to the regulation of leased lines. Although the existing specific normative acts of MCIT regulating the leased lines sphere are not comprehensive, the policy of MCIT and MED is to reduce tariffs gradually on leased lines whilst attempting to simplify regulation.

[12] http://www.gipi.az/eng/about.shtml

The maintenance and repair of leased lines as well as other telecoms equipment is carried out according to their level of usage. The regularity of routine repairs is established by the MCIT. The incumbents providing the leased lines carry out technical maintenance of these lines over the whole leasing period.

It has been known to happen that MCIT and the incumbents (Aztelekom and Baktelekom) apply the same tariffs for old copper telephone lines and new fibre-optic lines.

Sample prices (Aztelekom) for a variety of prices/lengths of leased line

Leased lines per month prices +VAT	64kbps	2 Mbps	34Mbps
Up to 50 km in length	15.57 US$ (12.81 Euro	US$ 191.49 (157.88 Euro)	4,742.55US $ (3,910 Euro)
One-off payment for connection	255.32 US$ (211.01 Euro)	447.80 US$ (369.21 Euro)	757.89 US$ (624.88)

Aztelekom publishes statistical information regarding service availability for the above options on its website.

State operators sometimes refer to the existence of technical limitations when they refuse the requests of commercial operators to connect their leased lines to public networks.

The available speeds for leased lines are 32kbps; 64kbps; 128kbps; 192kbps; 256kbps; 384kbps; 512kbps; 768kbps; 1024kbps; 2048kbps; 8mbps; 34mbps; and 155mbps.

The latest tariffs (per month) for satellite international leased channels in Azerbaijan are as follows:

Tariffs (per month) for satellite international leased channels

Symmetric	
Speed	Price
64Kbit/s	1,560US$ – 1,286 Euro
128Kbit/s	2,585US$ – 2,131 Euro
256Kbit/s	4,335US$ – 3,574 Euro
512Kbit/s	6,705US$ – 5,528 Euro
1024Kbit/s	10,565US$ – 8,711 Euro
2048Kbit/s	15840US$ – 13,060 Euro

Asymmetric	
Speed	Price
512/128Kbit/s	3960US$ – 3,265 Euro
768/192Kbit/s	5420US$ – 4,468 Euro
1024/256Kbit/s	6345US$ – 5,231 Euro
2048/512 Kbit/s	10085US$ – 8,315 Euro

The MCIT has also ordered the building of extensive fibre-optic networks in outlying areas to facilitate the provision of services by telecommunications providers. This move aims to provide the infrastructure to permit cheaper and more efficient access to networks for the approximately 70 percent of the Azerbaijani population that lives outside of the capital. The new infrastructure also aims to allow the country to capitalise

efficiently on its geographic location, which gives it access to several major backbones, such as the Trans-Asia-Europe fibre-optic line.

3.9 Mobile Services

There are two GSM (Azercell[13] and Bakcell[14]) operators providing services to the vast majority of Azeri mobile users. The third GSM mobile operator Azerphone has only recently begun to set up its own network infrastructure. It should start offering services at the beginning of 2007. Azercell controls approximately 83 percent[15] of the market, with Bakcell accounting for approximately 15 percent[16]. CDMA2000 provider CATEL[17] caters for the remaining (approximately) 2 percent of the market.[18] There are no MVNOs in the market.

The total number of subscribers is 2,242,000 (2005)[19] indicating an overall mobile penetration rate of 26.8%.[20].

A third GSM operator, Azerphone, is due to enter the market in early 2007 It is owned by Siemens (30 percent) and Aztelekom (10 percent). The remaining 60 percent are apparently owned by UK companies Celex[21] and Extel.[22] Azerphone has announced plans to invest almost 250 million Euro over the next two years.

A three minute mobile call costs 1 AZN (0.89 Euro) from Azercell to another network, while an SMS costs approximately 0.04 Euro.

For comparative purposes, monthly fixed line rental is approximately 0.60 Euro, while local calls are free.

GPRS services are provided by both GSM operators. The cost of a GPRS service from Azercell, as an example, is 0.02 AZN/50kb (0.018 Euro). EDGE services are offered by Azercell. Internet services are also offered by Catel

The vast majority of users are prepaid, 95 percent in the case of Azercell customers. Statistics relating to the number of SMS messages being sent are not available but it is believed that the popularity of SMS is growing rapidly. There are also no statistics available regarding the level of data service use.

[13] http://www.azercell.com/en/index.shtml

[14] http://www.bakcell.com/eng/index.html

[15] According to TeliaSonera's annual report 2004

[16] See http://www.comnews.ru/index.cfm?id=16858

[17] http://www.catel-az.com/eng/news.htm

[18] See http://www.comnews.ru/index.cfm?id=16858

[19] Based on 'Communication of Azerbaijan' Statistical Yearbook (for 2005)

[20] Based on 'Communication of Azerbaijan' Statistical Yearbook (for 2005)

[21] http://www.celexuk.com/

[22] http://www.extel.co.uk/default.asp

3.10 Satellite Services

Satellite communications services are offered by the main satellite telecom service providers Delta Telecom (previously known as AzerSat LLC),[23] Aztelekom,[24] and AzEuroTel.[25] Delta Telecom (Azersat) is the country's biggest satellite and fibre-optic backbone provider. Approximately 10 percent of households[26] have satellite dishes, which are mostly used for television services. Some home users also use satellite links to access the Internet.

Delta Telecom has built a HughesNet[27] Network in Baku, offering data transmission, IP backbone and high-speed Internet services to large clients such as the International Bank of the Azerbaijan Republic and the Seismology Data Centre.

Separate telecommunications services are provided to business users. For example, banks use satellite links to connect the ATM network with regional branches and federal Ministries use satellite links to communicate with regional departments. Corporate satellite communication networks have been created for IBAR, Capital-Bank, the State Customs Committee, the Ministry of Finance, the Ministry of Internal Affairs and the Ministry of Taxes.

VSAT services provide two-way Internet services and telephony.

At present, television companies broadcast from separate satellites but are planning to move to a single satellite so that all home users can receive channels through a single satellite dish. Services are also available using TDM/TDMA and SCPC technologies. It is predicted that DVB Broadcasting will also be available in the future.

ISPs use satellite services as a backup to IP backbone connections. In addition, three of the country's twenty four ISPs use their own satellite connections facilities - JV AzEurotel,[28] JV ADANet, and AzCom . Different ISPs also use the satellite links to deliver Internet services to regional corporate clients, state bodies, regional universities, Internet cafes and home users. Some of them use satellite connectivity to backup their terrestrial backbone connections.

A satellite terminal 3 TxPx VSAT has been installed in the framework of the Virtual Silk Highway Project.[29] This is a NATO project that provides satellite-based networking to the academic communities of Central Asia and the Caucasus. The Silk Project has created a virtual information highway to integrate academic computer networks in each of the countries involved. It may also increase regional cooperation between the research and educational centres of Azerbaijan. It was hoped that Silk Project would increase satellite channel capacity from 3mbps to 24mbps by the end of 2004. However, the most recent

[23] http://www.azersat.az

[24] http://www.aztelekom.net

[25] http://www.azeurotel.com

[26] According to IREX- International Research and Education Board

[27] http://www.hughesnet.com

[28] http://www.azeurotel.com

[29] http://www.silkproject.org/

information suggests capacity is currently only 5 Mbps. Extended capacity will pave the way for further developments, such as distance-learning systems.

MCIT is promoting the widespread usage of satellite technologies, together with Wi-Fi, as a low-cost alternative for remote rural communities lacking sufficient incumbent telecommunications infrastructure. A problem relating to regulatory restrictions in this area is connected to the system of licensing and certification. In order to provide satellite services, it is necessary for companies to obtain a licence and certificate from the MCIT. However, the procedure for this is somewhat confusing and new operators frequently find it difficult to obtain the official licences and certificates.

Leased satellite connections are significantly more expensive than leased lines, ranging from 3,960 US$ (3,273 Euro) for a 512kbps/128kbps connection to 10,085 US$ (8,334 Euro) for a 2048kbps/512kbps connection. A full price list is available from: http://www.mincom.gov.az/new/download/news/hisse1.doc

The Nakhichevan Autonomous republic, which is an enclave between Iran and Armenia, has its communications services supplied via satellite.

The national NREN, AzRENA,[30] has its own dedicated satellite channel.

3.11 Status of the National Regulatory Authority (NRA)

There is no independent national regulatory authority in Azerbaijan. The basic regulatory functions are carried out by the Ministry of Communications and Information Technologies.

In February 2004, the Ministry of Communication was converted into the Ministry of Communications and Information Technologies (MCIT). The new MCIT was intended to have a purely regulatory function, rather than have responsibility for the commercial aspects of the communications sector in the country, as the old Ministry had. The MCIT was thus established as a high-level policy body within the Government, responsible for promoting the development of the ICT sector, by creating a favourable regulatory environment and monitoring the implementation of ICT projects nationwide. The MCIT statute requires regulation to be transparent, non-discriminatory and that pricing should be cost oriented.

However, MCIT still has ownership of the dominant incumbents, Aztelekom and BakTelecom and maintains state shareholding in many alternative operators. This means it intervenes in the market as both a regulatory authority and as an operator and risks being prone to acting in the state-owned concerns' interests. The incumbent operators' directors are board members of the MCIT and it is their duty to participate in all decision-making processes. Being a part of the MCIT structure, Aztelekom and its staff are at the disposal of the Ministry.

There is no defined procedure for consultation with wider ICT business stakeholders or civil institutions. From time to time, MCIT holds meetings and round tables where market

[30] http://www.azrena.org/

players are given the opportunity to discuss regulatory issues and to request the minister deal with problems in the marketplace. However, in practice, all issues are discussed in MCIT Committees where the incumbent has a strong presence.

Thus, the two major factors hindering the development of the telecommunications sector in Azerbaijan are the lack of an independent NRA, which is currently planned by the MCIT, and the incomplete processes of liberalisation and privatisation of incumbent operators and state shares in other joint ventures.

The MCIT holds power over the setting up of joint ventures (JV) in telecommunications, being the co-founder of more than 20 JVs operating in the ICT sphere, although the management of these joint ventures and the fixing of tariffs for telecommunication services falls under the responsibility of the Inter-Ministerial Tariff Commission under the Ministry of Economic Development (MED).

According to the Statute of MCIT endorsed by Presidential Decree 111 of 10 August 2004, MCIT is the central executive body which formulates and implements state policy, ensures the regulation and development of communications and information technologies, and coordinates the activities of other Government agencies in the areas of communications and information technologies in the Republic of Azerbaijan.

The Statute defines the main organisational and legal basis, and duties of the Ministry to be:

- to formulate and implement unified state policy and regulation in the field of communication and information technologies;
- to take measures for creating new forms of social and economic activity through mass use of information technologies;
- to convert information into a commodity;
- to provide state control over the activities conducted in the field of communications and information technologies, including the use of radio-frequency spectrum, as well as the use and maintenance of satellite communication facilities;
- to be involved in developing and implementing necessary measures for meeting the demands of state bodies, municipalities and physical and legal entities for communication and information technologies services;
- to prepare and approve legal normative acts and standards regarding issues under the scope of the Ministry;
- to determine traffic rules in common-use communication networks, as well as mutual payment principles for traffic exchange among all communications operators;
- to supervise mutual accounting transactions with communications operators of foreign countries for the exchange of international traffic;
- to take measures within its scope for the formulation and development of e-Government and the e-economy and;
- to carry out the construction, development and improvement of cable networks, exploitation of cable broadcasting signals systems and use of frequency and channels, together with other state agencies in a manner defined by the law.

The possibility of the creation of an independent NRA is being actively discussed in Azerbaijan. One Government source has suggested that such an authority would have a purely regulatory function, unlike the MCIT which is a significant, dominant commercial

force in the sector. Such an NRA would probably manage the implementation of market-oriented reforms in the national telecoms market. In addition, MCIT recently undertook a large project with USTDA (the United States Trade Development Agency) with the aim of reforming the structure of the MCIT and preparing for the establishment of an independent regulatory body in Azerbaijan. However, the 2005 national Law on Telecommunications makes no direct mention of plans to establish a new regulatory body and instead suggests Azerbaijan should reform the telecoms sector as necessary to help achieve WTO accession.

3.12 Licensing and Authorisation

In 2002, a major reform of licensing in Azerbaijan reduced the number of business activities requiring licences from more than 240 to approximately 30, covering all sectors of industry. The validity period of licences was extended from two to five years. According to Presidential Decree 782, of 2 September 2002, MCIT licences are granted for telephone, cellular, paging, radio trunking, installation and operation of CCTV and courier services. The MCIT is responsible for monitoring compliance with licence conditions. Licences are issued within 15 days of submission of all relevant documentation and payment of the appropriate fee, which is 5,500 Manat[31] (4,916 Euro) for most services. Licences may not be transferred.

Decree 782 unified licensing rules for all types of licences and permitted the issuing of licences, with some limited exceptions, to foreign investors.

The 2005 Law on Telecommunications also includes rules covering licensing for telecommunications service provision. However, secondary legislation, which has yet to be published, is needed for these measures to be implemented and explained in more detail. In January 2006, the Ministry for Communications and Technology announced plans to change from the current situation, where one licence covers all telecommunications services, to a system with a variety of differently priced licences.

The 2005 law also covers the certification of communications equipment, although the scope of such requirements is yet to be clarified. There is concern among some industry players that this lack of clarity could translate into arbitrary actions on the part of government authorities, making it more difficult and expensive to provide telecommunications services.

Restrictions on ISPs have also been eased by the 2005 Law, which is intended to give a boost to competition in the Internet access and service provision markets.

3.13 Spectrum

The regulation of the allocation of radio frequency spectrum in Azerbaijan is dispersed across a number of different Government institutions. The main relevant state authority

[31] Decree of the President of Azerbaijan Republic № 782 dated 2 September 2002

is the Azerbaijan State Committee on Radio Frequencies (ASCR) acting under the authority of the MCIT. Another relevant authority is the National Council on Television and Radio Broadcasting, which allocates frequencies for Television and Radio Broadcasting. A third authority is the Commission on Radio Frequencies acting under the authority of the Cabinet of Ministers. The role and functions of the Commission are not defined in any great detail. The Commission develops and implements State policy with regards to the deployment of spectrum. All other authorities dealing with radio spectrum are under its general control.

Frequency is allocated in accordance with the provisions of the General Regulation of ASCR (1996), although these regulations are quite outdated. It was anticipated that new rules in this policy area would be included in the Law on Telecommunications. However, the 2005 Law on Telecommunications does not significantly change the specific details of regulation of radio frequency in Azerbaijan. The ASCR is in the process of putting together a national frequency allocation table, but this is not currently in place, limiting the authorities' ability to manage spectrum efficiently. The MCIT has announced that the new rules for spectrum allocation will be targeted at more efficient, commercial usage.

4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES

4.1 Digital Signatures

Article 336(3) of the Civil Code of Azerbaijan allows the use of electronic means in written sale agreements, including confirmation of documents by means of electronic digital signatures when all parties to an agreement accept this.

According to Article 3(1) of the Law on E-signatures and E-documents (2004), an e-signature can be deemed invalid simply on the grounds that it is in electronic format and does not have a certificate or has not been created by a certified authority. The subsequent provision of the same article says that only electronic signatures created by certified means and using an advanced signature certificate possess equal legal status to signatures in paper form. The definition of advanced certificate one that "*contains the information on a signature provided by an accredited centre of certification services*" (article 1.11).

According to article 36(3), the parties bear individual responsibility for the usage of non-certified means of electronic document circulation and electronic signature, i.e. parties are deprived of legal protection if they use electronic signatures in such circumstances.

Five legal acts[32] were adopted at the beginning of 2006 in order to clarify and regularise the situation of digital signatures in the country. In addition to accreditation, a certification centre must also pass an obligatory registration process in the appropriate state body before commencement of activity. It is not yet clear which state body will fulfil this task, although it appears likely that it will be the MCIT. The ministry intends to start providing this function early in 2007.

Foreign electronic signatures are permitted but they need to be confirmed as being in line with the rules of their country of origin. This means that, while local accreditation is not yet possible, there are no legal barriers to using digital signatures which have been appropriately accredited abroad.

The government's stated commitment to e-government, for reasons of efficiency, transparency and support for the development of the wider ICT industry are expected to fuel demand for e-document and e-signature services.[33]

[32] Rules on Verification (testifying/checking) of e-signatures' (http://www.mincom.gov.az/new/download/qaydalar/027-28-01-06.rtf), Guidelines for registration and accreditation the centres issuing e-signature certificates and delivering e-signature-related services, Guidelines on issuing certificates and maintenance register on e-sign certificates; Rules on using e-sign in state gov and local gov bodies; and Guidelines on e-document circulation http://www.mincom.gov.az/new/download/qaydalar/027-28-01-06(add).rtf

[33] See, for example, Speech of Minister Ali M. Abbasov at the World Bank e-Government workshop, 26 April 2005. http://siteresources.worldbank.org/INTEDEVELOPMENT/Resources/559323-1114798035525/1055531-1114798256329/1055556-1114798371392/Abbasov.pdf

4.2 Payment Systems

The legislative system for e-payments is adapted from European practices. Commercial regulatory law is outlined in the Civil Code of Azerbaijan and in the law on "e-Commerce." The e-commerce law covers the rules for online commercial operations, covering conclusion of contracts and online payments. The Ministry of Taxes, the Ministry of Social Insurance, the State Customs Committee and the Ministry of Economic Development are the bodies responsible for the establishment and implementation of e-payment systems.

The banking and financial sector have pushed the use of e-payments forward through the introduction of credit card and online payment systems for conducting e-commerce. For example, a new electronic payment system to allow money to be transferred between cardholders – and even to non-cardholders – has been launched in Azerbaijan.[34] This is in line with the 2005-2007 State Programme on the Implementation of a National e-Payment System. This plan[35] foresees a wide range of e-payments innovations, with ownership of each project being given to named ministries and agencies, with implementation taking place between 2005 and 2007.

[34] http://www.rabitadunyasi.info.az/rd/dim.asp?id=3353
[35] http://www.nba.az/download/o_sistemi/dprengimpl.xls

5 USE OF ELECTRONIC COMMUNICATION SERVICES

5.1 Fixed Telephony Penetration

Most areas of Azerbaijan have a relatively high degree of telecommunication service coverage when compared with the other countries examined in this study. All rural regions have some digital switches, usually in the district centres. Before 2003, most had analogue switches. Fixed telephony networks are present in almost all villages in Azerbaijan, including those that are close to the borders of neighbouring countries. Hard-to-reach and mountainous territories are connected by microwave links and analogue switches.

In 2004, more than 31 percent of rural households had access to fixed telephone services in their homes. According to the State Project on the Development of a Road Map for Rural Telecommunication, all rural mountainous areas in villages with more than 100 inhabitants have radiophone networks.

Fixed Phone Lines (MCIT Statistics)[36]

	1995	2000	2001	2002	2003	2004	2005
Number of fixed phone lines per 1000 inhabitants	85	100	107	114	115	122	137.9

5.2 Mobile Usage

Mobile communication is currently the most rapidly developing field of electronic communications in Azerbaijan. In 2004, the penetration rate was 16.45 percent of the total population, with 1.4 million subscribers. The penetration rate reached 26.9 percent in 2005.[37]

In some urban areas, the number of mobile users has already outnumbered the number of fixed line users.

5.3 Cable Services

A survey carried out by a partnership of various international organisations, including Internews, calculated that in March 2006 5.1 percent of households in Azerbaijan are connected to cable networks.

[36] Based on 'Communication of Azerbaijan' Statistical Yearbook (for 2005)
[37] State Statistical Committee of the Republic of Azerbaijan - http://www.azstat.org/publications/azfigures/2006/en/016.shtml

5.4 Computer Availability

According to official statistics the computer penetration is 2.3%.[38] The overwhelming majority of PCs that are in use belong to public authorities and private companies and are used for clerical work. The number of computers used for private purposes is still very low; however, this has been changing in recent years and the number of individual users is growing. The main reasons for this are the growth in Internet use and a reduction of user charges for Internet access.

The average cost of a basic computer (P4/40Gb/DDR256Mb) is about 350 Euro due to low-cost, local assembly of computers. The average monthly salary was 86 Euro in 2004.[39] Thus, the cost of a computer was equivalent to about 3.5 times the average monthly salary.

Information obtained from the Ministry of Education indicates that only 2,053 computers (modern generation Pentium, Celeron and similar) were used in the secondary education system, which works out at 1 computer per 990 pupils. All schools in the main cities offer information technology classes, although outdated computers were used for 60 percent of them. In the regions, only 26 percent of schools had computer education. Overall, therefore, the situation is significantly worse in the regions than in urban areas.

Following a Presidential Decree on 15 August 2004, the State Programme on the Provision of Information Technologies in Secondary Schools was launched. The programme will be implemented in three phases and 16.44 million Euro has been allocated from the State Budget to supply 4,521 secondary schools with computer equipment over the next 3 years. The programme will provide one PC for every 33 pupils and it will create employment for more than 3,400 teachers and 4,500 laboratory assistants. The computers will reportedly use open source software.

To facilitate the program, the Mingechevir computer plant is being constructed. It will be the main manufacturer of PCs for schools.

With regards universities, the situation is somewhat better in Baku, where there is one computer per 124 students, compared with one for 283 students in the universities of Sumgayit and Ganja.

5.5 Internet Access

There are currently 24 Internet access providers in Azerbaijan, providing a wide range of services. The price of a one-hour dial-up connection has dropped by 75 percent over the last ten years. Prepaid and post-paid Internet access cards have been introduced to the market to offer customers greater choice.

[38] Based on 'Communication of Azerbaijan' Statistical Yearbook (for 2005)

[39] State Statistical Committee of Azerbaijan.

Prices for Internet dial-up access can vary depending on whether the user is in Baku or in the regions.

Cost of Dial-up Internet Access (AzEuroTel)[40]

Service Name	Price in Baku		Price in Other Regions	
	AZN	EUR	AZN	EUR
Price of 1 hour Internet access	0.40	0.36	0.36	0.32
Monthly subscriber payment for additional e-mail address	1.60	1.43	1.60	1.43
1 statistic IP - address	2.00	1.79	2.00	1.79
Unlimited access	40.00	36.00	36.00	32.00

Note: Prices do not include 18 percent VAT

AzEuroTel has a very wide range of ADSL price offerings, the following is a sample of the slowest, fastest and mid-range speeds.

Cost of ADSL access per month (AzEurotel)

Speed	AZN	Euro
64/64	40,68	36.36
256/128	127,12	113.63
256/256	144,07	128.78
512/512	338,98	303

Note: Prices do not include VAT of 18 percent and an installation fee of 13.56 AZN/12.14 Euro

5.6 Public Internet Access Points (PIAPs)

There are more than 450 Internet clubs in Baku, the main cities and several other regions, which were established by the private sector. Internet centres established by the state authorities also exist. In the state-run Internet centres (which number over 31 and which are located in various regions of the country), Internet access and basic computer knowledge classes are taught.

There are also a significant number of free Internet access points provided in universities, internet cafes and in the growing number of wireless hotspots (see below).

Under the framework of programmes initiated by OSI,[41] UNDP[42] and IREX,[43] 14 network e-libraries have been created and are based in the central libraries of the capital and other main cities. All of them are well equipped with computer networks and provide people with free Internet access.

[40] http://www.azeurotel.com
[41] http://www.soros.org/
[42] http://www.undp.org/
[43] http://www.irex.org/

5.7 Wireless Internet Access

The wireless access services market is one of most dynamic growth markets in the ICT sector and is expected to become a key means of broadening public access to information resources. Today, the campuses of several universities in Baku and the central area of the National Park in Baku are already covered by free wireless access services. The local telephone companies ULTEL, Catel and AzEuroTel have announced their plans to provide wireless services at all universities, central libraries and public places in the capital. Intel is heavily involved in supporting the roll-out of these services.

6 AVAILABILITY OF ONLINE SERVICES

Azerbaijan was the only country from the southern Caucasus, and one of only four CIS countries, included in the list of 68 countries of the Economist e-readiness report although it was in last place.[44] Azerbaijan received 2.92 points out of a possible 10 (having received 2.37 in 2002) and has improved its score a little each year. Denmark was first at 9.00. Of the other CIS countries Russia, Ukraine and Kazakhstan were 52nd, 61st, and 64th respectively with ratings of 4.30, 3.62, and 3.22 points.

6.1 E-Commerce

The National Communication and Information Technologies Strategy for the Development of the Republic of Azerbaijan focuses on improving e-governance, the e-competence of enterprises, and the availability of infrastructure for conducting e-business and e-commerce.

The State Statistics Committee only collects general data relating to ICT industry activity and therefore there is no relevant detailed information on e-commerce specifically. Overall, ICT products and services are worth 467 US$ (386 million Euro) million per year.[45]

The Azerbaijan Internet services market is growing rapidly. Businesses are showing more and more interest in the Internet, as indicated by growth of over 100 percent in the overall value of communications services from 2000 to 2004.[46]

E-business in Azerbaijan is in a stage of intensive development, with B2C growing more rapidly than B2B. The steadily growing number of local companies in Azerbaijan has allowed the development of B2B e-commerce applications. However, the majority of B2B transactions are still being carried out in traditional ways, through phone, fax or paper-based communications.

There is also a growing number of auction sites in Azerbaijan. Many Azerbaijani portals and major sites are endeavouring to trade and conduct auctions. These sites usually offer advertisements with descriptions of goods for sale or purchase. There are two main websites (www.auction.az and www.bazar-az.com) that aim to encourage e-trade and information exchange in the countries of the Caucasus, Middle Asia and Europe.

Various industries are represented at www.bazar-az.com. The site features databases of producers, product descriptions and prices. It also contains information on product delivery and transportation infrastructure. This site gives information in Russian, English, Persian and Turkish. It is possible to buy and sell products as diverse as cars, paper, oil and corn via the site. The problem is that there are very few participants from Azerbaijan, although the company is registered there. This can be explained by the late implementation of e-banking and e-payment systems in the country. www.Auction.az

[44] 2005 e-Readiness Report, Economist Intelligence Unit
[45] According to the Azerbaijani Mission to the EU.
[46] "Azerbaijan in figures, 2005", State Statistical Committee of Azerbaijan

also offered a wide variety of goods for sale, but operations have been frozen due to the lack of e-commerce infrastructure and resultant lack of demand. A number of other B2C sites are being developed.

According to the 2003 Country Profile produced by UNCTAD/WTO, chat, e-mail, games and search were the most popular online activities in Azerbaijan.

6.2 E-Government

On 12 August 2005, the new Law on Access to Public Information was ratified. This Law is key to the provision of more comprehensive government information through e-government solutions. The legislation places an obligation on government to provide interactive official websites, making all relevant and unrestricted information available to citizens.

Azerbaijan was ranked 78th out of 133 countries in 2001 with regards the implementation of e-Government according to a UNPAN E-Government-Global Survey.[47]

About 55 percent of Government Ministries and State Authorities currently have their own official websites.[48] All of these sites contain descriptions of their respective missions, general responsibilities and structures, information on working hours and duties of departments or directors. At the site of the Ministry of Taxes, citizens may ask questions and receive answers electronically.

The Government of Azerbaijan has a number of plans and proposals to expand the use of ICT in the State sector, particularly in such areas as information security and other database/registration systems. A State Programme on the Development of ICT in Azerbaijan has been created, with the aim of increasing the effectiveness of the use of ICT by State authorities, facilitating the interaction of the general population with these institutions and eliminating bureaucratic obstacles, as well as providing interoperability of information systems.

The joint Azerbaijan Government-UNDP Program, the National e-Governance Network Initiative, signed in June 2004, has been established in order to accelerate the training of Government officials, to provide transparency of state bodies, and to promote the building of the Information Society in Azerbaijan. The main goal of the programme is to create Government information portals and information access centres, which will be effective in facilitating interaction between citizens and Government systems in six regions of the country. Various elements of this programme are beginning to bear fruit, such as the rollout of the AzDATACOM network, which will allow regional government offices to establish VPN connections with central government, the tax registration portal and improvements to government websites.

A new, interactive, online tax system went online this year, allowing taxpayers to register their tax returns and make payments directly through their bank accounts. Progress has

[47] The survey can be accessed here: http://www.unpan.org/e-government/globalleaderstables.htm.
[48] For more details on these websites see: http://www.gateway.az/eng/partners.shtml.

also been made, with the input of the UNDP, to improve the level of computerisation and automation of the national customs authorities.

6.3 E-Health

There are few, if any, significant e-health programmes in Azerbaijan. The UNDP-organised national IT awards for the country were not able to identify any e-health projects worthy of consideration.

A number of online health resources have begun to appear recently, such as http://doctor.aznet.org and http://www.mednet.az, although these are still quite basic.

6.4 E-Learning

On 28 October 2005, the Ministry of Education, with UNDP support, launched the "State Programme on provision of secondary and primary schools with information and communications technologies" (2005-2007). The Programme aims to support the computerisation of schools and to launch training courses for teachers in different regional (rayon) centres. The program aims to develop an overarching policy direction to support ICT in education, including computer literacy and Internet use. Ultimately, the Programme aims to provide one computer per 33 schoolchildren.

According to a statement of the Minister of Education, this programme is well on its way to achieving its targets. Up until the middle of 2006, all schools in capital and Absheron Peninsula had been equipped by up-to-date computer equipment and connected to the Internet. Due to increased financial and organisational support from the government, a more ambitious target of one computer per 27 schoolchildren has now been set.

Many central universities such as Baku State University, Azerbaijan Technical University, Azerbaijan Economical University, Azerbaijan Oil Academy, Khazar University (private) intensively use their own e-learning (distance learning) facilities.

A European Commission project on Creating e-Societies in the South Caucasus was launched in September 2005 and is due to last for two years. This includes a significant E-Learning component.

The Silk Project[49] has created a virtual information highway to integrate academic computer networks in each of the countries linked to it (Armenia, Azerbaijan, Georgia, Tajikistan, Turkmenistan, Kazakhstan Uzbekistan and, eventually, Afghanistan). It may also increase regional cooperation between Azeri research and educational centres. Within the framework of the Silk Project, it was hoped that satellite channel capacity would increase from 3 Mbps to 24 Mbps by the end of 2004. The most recent information suggests channel capacity is currently only 5 Mbps. Extended capacity will pave the way for further developments e.g. distance learning systems.

[49] http://www.silkproject.org/

Universities and colleges in Azerbaijan are involved in a wide range of international programmes, provided in the framework of the NATO science programme, the German Academic Exchange Programme (DAAD), TASCIS and TEMPUS (a higher education mobility scheme).

The AzNet programme, run by the Ministry of Education, AzRENA and the Open Society Institute, aims to give 50 percent of Baku, and 25 percent of other, secondary schools a 128kbps connection by the end of April 2007.

The national AzRENA[50] has its own dedicated satellite channel.

[50] http://www.azrena.org/

7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY

It was decided on 10 August 2000 that the State would cede its shares in joint-stock enterprises and joint ventures. In so doing, the Government hoped to attract investment to improve the efficiency and competitiveness of these companies. The Ministry of Economic Development (MED) was authorised to offer enterprises for privatisation through specially designed individual projects and investment bids, envisaging that equal opportunity of investment would be made to foreign and local investors.

The chart below summarises the ownership and activities of the five fixed line operators and three GSM network operators in Azerbaijan.

Summary: Ownership structure and activities of main players in Azerbaijan

Name of Company	Operational Activity	Ownership Structure
Aztelekom[51]	Aztelekom is the dominant state telecoms carrier operating primarily outside Baku. It controls the overwhelming majority of fixed, fibre and significant number of satellite communications lines, and implements pricing policy for interconnection.	MCIT has 100 percent ownership.
Baktelekom[52]	Baktelekom is the second largest national telecoms service provider. It provides all kinds of telephone and radio communication services in the territory of Baku city. It also provides Internet access via Bakinter.net	MCIT has 100 percent ownership.
AzEuroTel[53]	AzEuroTel is the largest JV company and the only real competitor to Aztelekom, with a major fibre, satellite and fixed-line network. It provides a variety of telecommunication services: local telephone network, national and international communication, multipurpose trunking and satellite communication, and packet data transmission.	It is a UK-Azeri JV, which was founded in 1995 by the Azeri Ministry of Communication (Min Com) and LUKoil Europe Ltd (whose parent company is Russian). Both Min Com and LUKoil have 50 percent shares in the company.
CATEL (Caspian-Azerbaijan Telecom)[54]	CATEL is the operator of a fixed-line network and the first fixed wireless digital telephone network. Since February 2005, it is the third mobile operator in the 3G CDMA standard.	It is an US–Azeri JV, which was established in 1997 by Min Com and the US Consortium OMCL (Omni-Metromedia-Caspian Ltd.). The Azerbaijani and American companies have equal shares in the company.
Ultel[55]	Ultel is a fixed-line network, which provides services in Baku.	It is a Turkish-Azerbaijan JV, which was founded in 1991 by Min Com (51 percent share) and the Netash Turkish company (49

[51] http://www.aztelekom.org/

[52] http://baktelekom.bakinter.net/

[53] http://www.azeurotel.com/

[54] http://www.catel-az.com/

		percent).
Azercell[56]	Azercell is the biggest mobile company. It provides mobile services in all regions of country.	It is a Turkish-Azeri JV, which was established in December 1996 by Fintur Holdings BV (51.3 percent shares), Cenay Insaat (13 percent) and Min Com (31.7 percent).
Bakcell[57]	Bakcell is the second largest cellular communication company. It provides mobile services mostly in the capital and major cities.	It is an Israel–Azeri JV, which was founded in March 1994 by GTIB and Min Com. In December 2003, it was completely privatised.
Azersat LLC[58] Was renamed to Delta Telecom	Azersat LLC is the biggest satellite communication systems operator and Internet backbone provider.	It is an US-Azeri JV, which was established in July 2002 by Min Com (51 percent share) and Delta Telecom (49 percent).
Az.Starnet[59]	Az.Starnet provides network services based on broadband wireless communication.	It is an US-Azeri JV, which was founded in 2002 by the Arizona Daily Star and Min Com. Both companies have equal shareholding of 50 percent.
Baku & Boston TV	B&B TV provides cable communication services including television programming.	It is an US-Azeri JV, which was established in 1996 by Boston TV Communication (70 percent share) and Min Com (30 percent share).

Source: State Statistics Committee 2005

The state is a major player in this sector and it typically has a shareholding of at least 50 percent in Joint Venture companies. No official information is available with regard to the shareholdings of private citizens in Azerbaijani telecommunications companies, but it is not considered to be a significant amount.

7.1 Fixed Networks

As a result of the National Programme of State Property Privatisation, the Law of Privatisation was passed in January 2003, subsequent to two Presidential Decrees introduced on 22 and 29 March 2001, paving the way for the privatisation of state companies.

At present, the Government is preparing to privatise a number of telecoms companies. The calls for tender for the selection of financial consultants to facilitate the privatisation processes have already been completed by the MED.

Privatisation is expected to lead to general improvement in the telecoms system and to create a market for more advanced systems. Aztelekom,[60] having a monopoly on long-distance and international calls, including the leasing of intercity and international channels, was considered likely to attract foreign investors. However, little progress has been made with privatising it.

[55] http://www.ultel.az/
[56] http://www.azercell.com/
[57] http://www.bakcell.com/
[58] http://www.azersat.az/
[59] http://www.simsiz.net/eng/company.htm
[60] http://www.aztelekom.net/index.php?lang=en

All companies operating in the telecoms sector were established as Joint Ventures (JV) with the former Ministry of Communications, currently the MCIT. In most cases, the MCIT holds majority shares (typically 51 percent). The management of the state-owned shares falls under the responsibility of the MED. In these Joint Ventures, the MCIT provides general support for the enterprise, while the other partner is expected to provide operating and investment capital and to be responsible for the overall operation of the company.

Although some international telecommunications companies are present in the Azerbaijan market through joint ventures, the fixed line sector is still mainly controlled by the two state-owned incumbents: Aztelekom and Baktelekom, both of which are controlled by MCIT.

Under the authority of the Aztelekom Production Union, there are 54 telecommunications enterprises such as the Baku Intercity Telephone Unit, and the Cable Technical and Repairs Unit.

BakTelekom is the monopoly provider of all telephone and radio communication services in the territory of the city of Baku. Baktelekom functions on the basis of self-financing principles.

In addition to the two state-owned operators, there are three Joint Venture fixed-line operators: AzEurotel,[61] Catel[62] and Ultel.[63] The most recent entrant to the market is AzTrank,[64] which provides services using the fixed CDMA standard. The market breakdown, according to the most recent information available from the MCIT (which dates from 2004) is as follows:

Aztelekom – 50.78 percent
Baktelekom – 42.3 percent
Ultel – 2.46 percent
Azeurotel – 2.1 percent
Catel – 1.57 percent

7.2 Mobile Networks

There are three main mobile communications companies in Azerbaijan. Bakcell,[65] the first mobile communication company in Azerbaijan, was established in March 1994 as a Joint Venture between an Israeli-based company, GTIB, and the then Ministry of Communications. Bakcell has now been privatised, with GTIB purchasing 51% of the shares in the company in December 2003. Bakcell has been running an aggressive campaign of investment and price reduction (up to over 80 percent in some cases) for the past year.

[61] http://www.azeurotel.com

[62] http://www.catel-az.com

[63] http://www.ultel.az

[64] http://www.aztrank.az/index.php?l=en

[65] http://www.bakcell.com/eng/index.html

Azercell[66] was established in December 1996 as a Joint Venture between Fintur Holdings[67] and the then Ministry of Communications. There is an expectation that the state shareholding will eventually be sold, thereby putting the company 100 percent into private hands. However, no progress has yet been made in this area recently.

A third GSM operator, Azerphone, has been awarded a licence and was expected to launch services in September, 2006. The launch was subsequently postponed to the first quarter of 2007.

CATEL (Caspian American Telecom LLC) a Joint Venture between Azerbaijani and American entities, was established in 1997 by the Ministry of Communications of Azerbaijan with Omni-Metromedia Caspian Ltd. (OMCL). At the beginning of February 2005, CATEL introduced 3G CDMA mobile services in Baku, Sumgait and the Absheron Peninsula.

7.3 Cable Networks

There are few cable networks in Azerbaijan, the only one of note being B&B TV, which provides television and Internet services in Baku. The company is a joint venture between the MCIT and the American company EBI.

7.4 Internet Access Networks

There is very little ADSL on offer in Azerbaijan, with the vast majority of users connecting via dial-up. In the regions, Bakinternet[68] has a virtual monopoly, its identical pricing structure for urban and rural areas suggesting that it would be difficult for a competitor to address areas where set-up costs would be higher.

In recent years, AzTelekom has build up a domestic broadband infrastructure that has enabled it to bring services like IP telephony, ISDN, ATM and DSL within reach of many business and residential customers. Recently the MCIT finalised the roll-out of fibre-optic data connections between all telephone (PSTN) exchanges stations in the capital.

7.5 Satellite Operators

Satellite communication services are offered by the main satellite telecom service providers AzerSat LLC,[69] AzTelekom,[70] AzEuroTel[71] and Adanet.[72] Delta Telecom has

[66] http://www.azercell.com/en/index.shtml

[67] http://www.finturholdings.com/html/

[68] http://www.bakinter.net/

[69] http://azersat.net/

[70] http://www.aztelekom.org/

also built a satellite-based network in Baku city. The majority of satellite communications users are from the corporate market, although some residential users also use satellite links to access the Internet.

Separate telecommunications services are offered to business users. For example, banks use satellite links to connect the ATM network with regional branches and Ministries use satellite links to communicate with regional departments. The State Customs Committee uses these services to synchronise databases.

Corporate satellite communication networks have been created for IBAR, Capital-Bank, State Customs Committee, the Ministry of Finance, the Ministry of Taxes as well as other smaller networks.

Through the ISBN Central Satellite Communication Station, in 2004, AzerSat LLC established corporate satellite communication networks for the National Bank of Azerbaijan, the Centre for Seismic Measurements of the National Academy of Sciences of Azerbaijan, and the Ministry of Internal Affairs. AzerSat also offers access to international services, in particular, broadcasts from the USA, Turkey, Germany, the United Kingdom, Italy and Russia are available. In Ganja, the second largest city in the Republic, an intercity “S-12” station has been installed.

VSAT services provide two-way Internet services, telephony, and, in the near future, television over IP. It is understood that DVB Broadcasting will also be available in the future. At present, television companies broadcast from separate satellites but are planning to move to a single satellite so that all home users can receive channels through a single satellite dish. Services are also available using TDM/TDMA and SCPC technologies.

ISPs use satellite services as backup to IP Backbone connections. ISPs also use a satellite-based network to provide Internet Services to regional Internet cafes and home users. In addition, three of the country's 14 ISPs use satellite connection provided by AzEuroTel,[73] the Joint Venture AdaNet[74] and AzCom[75] to access the Internet independently of any state satellite providers.

A satellite terminal 3 TxPx VSAT has been installed in the framework of the Virtual Silk Highway Project, known as the Silk Project. This is a NATO project that provides satellite-based networking to the academic communities of Central Asia and the Caucasus.

There is an expectation that actively harnessing the full potential of satellite and wireless telecommunications services will help independent operators compete with incumbent or monopoly internet service providers in Azerbaijan. Satellite services are intensively used in large scale state projects such as “Unique Custom Declaration Automatic Registration”, and the “Joint Notarial Registration System” where they have demonstrated overwhelming advantages over traditional, earthbound communications, and wireless networks for providing communications between central offices and remote branches located in isolated locations.

---

[71] http://www.azeurotel.com/
[72] http://www.scissors.az/index_e.html
[73] http://www.azeurotel.com
[74] http://www.azdata.net
[75] http://www.azcom.az/

The increased availability of satellite connections is believed to have had a positive impact on the market, helping push down prices:

- In 2002 the price per Mbps of a one-way Internet Backbone connection was approximately 36,000 US$ (29,800 Euro). In 2005, it was 3,900 US$ (3,200 Euro) per 2 Mbps of a two way IP Backbone connection;

- In 2000, the price of a 128Kbps VSAT service was US$900 (744 Euro). In 2005, it was 250 US$ (207 Euro) for a 256KBPS direct VSAT service;

- In 2000, a 2Mbps transmission service in Baku city cost approximately 340 US$(281 Euro) monthly and there was a 1,276 US$ (1055 Euro) sign up fee. Today, 100Mbps transmission costs 680 US$ (562 Euro) and there is no sign up fee.

The MCIT is promoting the wide usage of satellite technologies, together with Wi-Fi, as a low-cost alternative for remote rural communities lacking any incumbent telecommunications infrastructure. A problem relating to regulatory restrictions in this area is connected to the system of licensing and certification. In order to provide satellite services, it is necessary for companies to obtain a licence and certificate from the MCIT. The necessary procedure for this in somewhat confusing and new operators frequently find it difficult to obtain the official licences and certificates.

7.6 Production of IT Services

ICT development in Azerbaijan has long been driven by the requirements of its large oil industry. This has led to a legacy of low cost computer assembly in the country. Azerbaijan was one of only four countries that manufactured computers and computer chips for use throughout the former USSR.

The current market can be divided broadly into five sections:

1. Hardware and parts assembly

At least 16 large and medium sized companies produce computer hardware, making up 60 percent of hardware on the Azeri market. About 20 percent of the market is covered by international brand name units, whilst small producers produce the remaining 20 percent.

Among the most advanced and successful companies are Aztech Azerbaijan Technologies,[76] R.I.S.K.,[77] Azel,[78] Techno Services,[79] Top Az, Best Computers,

[76] http://www.aztech.az

[77] http://www.risk.az/

[78] http://www.azel.net/

[79] http://www.technoservice-az.com/

Computer Land, DNS Computer,[80] Unitech,[81] Marko,[82] Cen Group,[83] Ultra Computers,[84] Stream Technologies,[85] N-Link,[86] Smart Computers, and Computex.[87] Companies tend to import the components for assembly. Low cost, locally sourced computers provide an advantage for the development of the information society in Azerbaijan.

Major investment is underway to further increase computer production, including a major programme to increase the use of computers in schools.

2. Telecommunication and Radio Communications Equipment production

Some 27 companies, most of them SMEs, are engaged in assembling and manufacturing telecommunication and radio equipment. A skilled workforce and technological know-how exist for system integration services and the production of digital telephones and access devices, as well as satellite antennae, professional mobile radio stations, microwave stations, PCM multiplexers, satellite receiver equipment, terminal blocks and telemetric equipment for the oil sector, etc.

3. Software Application Development

There are more than 40 companies developing software applications, system integration and providing web-hosting and web-designing services. There are an estimated 27,500 software professionals working in this sector — 1,500 network engineers, 10,000 programmers, 1,000 systems analysts and designers, and 15,000 data entry operators.

4. Components and Sub-Assemblies

This sector is based on the manufacturing of semiconductors and electronic components for countries of the Soviet Union in the past, although it is now in decline. A notable development is that almost 50 percent of the computer market is served by local assemblers importing components from Asian sources to service demand in their domestic markets. As mentioned above, the development of engineering applications based on the expertise from the oil sector could be the cornerstone of significant growth of the software and electronic industry in Azerbaijan.

Major international companies such as Oracle, Microsoft, Intel and others have opened their regional (south Caucasus and Caspian basin) offices in Baku.

5. Consultancy and Systems Integration

A wide array of consultancy and systems integration services is available in Azerbaijan, from companies such as Azerbaijan Communications.[88]

---

[80] http://www.dns.az/

[81] http://www.unitech.az/

[82] http://www.marco.az/

[83] http://www.centelecom.com/

[84] http://www.ultra.com.az/

[85] http://www.streamtech.net/

[86] http://www.nlink-az.com/

[87] http://www.computex.ws/

[88] http://www.azcom.az/

Azerbaijan: Market for ICT Products (Value Million US$/Euro)

Items		1998	1999	2000	2001	2002	2005
EDP Computer Hardware		30/25	28/23	32/26	38/31	40/33	60/50
	Servers	8/6.6	6/5	7/5.8	10/8.	10/8	15/12
	PCs & Workstations/Other add-ons	22/18	22/18	25/20	28/23	30/25	45/37
EDP Data Communication Hardware		6/5	5/4	5/4	7.5/6	8/6.6	10/8
	LAN Hardware	4/3.3	3/2.5	3/2.5	4.3/3.5	6/5	7/5.8
	Other data communication	2/1.6	2/1.6	2/1.6	3.3/2.7	2/1.6	3/2.5
Software & Services		4/3.3	3.5/2.9	6/5	7.5/6	10/8	50/41
	Software Products	2.5/2	2/1.6	3.5/2.9	4/3.3	5/4	20/16
	Software Services	1.5/1.2	1.5/1.2	2.5/2.0	3.5/2.9	5/4	30/24
Telecoms Equipment		65/53	61.5/51	60/50	58.5/48	50/41	200/165
	Public Network Equipment	40.5/33	38.5/32	38/30.4	36/29.8	20.5/17	150/124
	Public Network Equipment end user devices	24.5/20	23/19	22/18	22.5/18 .5	29.5/24	50/41
Office Equipment		11/9	10/8.2	12/9.9	11.5/9. 5	12/9.9	15/12.4
	Copiers	7/5.8	6.5/5.3	6.5/5.3	6.5/5.3	8/6.6	10/8.2
	Other Office Equipment	4/3.3	3.5/2.9	4.5	4/3.3	4/3.3	5/4
Semiconductors		2/1.6	2/1.6	2/1.6	1.5/1.2	1/0.8	---
Passive Components		2/1.6	2/1.6	2/1.6	1.5/1/2	1/0.8	---
Scientific Instruments & Control and Measurement Equipment		10/8.2	12/9.9	12/9.9	12.5/10	12/9.9	15/12.4
TOTAL		**130/107**	**124/102**	**131/ 108**	**138.5/ 114.46**	**200/ 165**	**350/ 289**

Source: ITC project file / European Information Technology Observatory

7.7 Financial Development of the ICT Sector

The State Statistical Committee of Azerbaijan provides a useful level of figures regarding the development of the ICT sector in the country.

The following is a breakdown of revenues (in US$/Euro) from public communication services for 1995-2005. Local call and line revenue is not included in the table below

Breakdown of revenues (in thousands US$ / Euro) from public communication services for 1995-2005.

	1995	2000	2001	2002	2003	2004	2005
Total revenue in thousands from all communication services	25,460/ 21,041	160,370 / 132,537	178,034 / 147,135	208,533 / 172,341	256,547 / 212,022	337,205 / 278,681	523,992 / 433,113
Intercity/international calls percent of total	21,571/ 17,827 84.7 percent	68,370/ 56479 42.6 percent	68,056/ 56,244 38.2 percent	71,392 / 59,001 34.23 percent	82,128/ 67,874 32 percent	94,485 78,086 28 percent	123,606 / 102,154 / 23.6 percent
Mobile communication		73,859/ 60,379 46	90,328/ 74,651 50.7	111,131 / 91,843	146,977 / 121,468	216,991 / 179,331	335,815 / 277,533

percent of total		percent	percent	53.3 percent	57.3 percent	64.4 percent	/ 64.1 percent
Internet percent of total		1,668/ 1,378 1 percent	1,779 1,470 0.99 percent	2,612 2,158 1.25 percent	3,270/ 2,702 1.27 percent	3,905/ 3,227 1.16 percent	9,798/ 8,098/ 1.9 percent

Source: State Statistical Committee 2005-06-18 [89]

The table below outlines the approximate size of the total long distance and international calls markets in Azerbaijan.

Total (US$/Euro) of the long distance and international calls markets in Azerbaijan

Incomes	1995	2000	2001	2002	2003	2004	2005
Total from all services (10^3)	25,460 21,041	160,370 132,537	178,034 147,135	208,533 172,341	256,547 212,022	337,205 276,681	523,992/ 433,113
From long distance & international calls	21,571 17,827	68,370 56,975	68,056 56,244	71,393 59,002	82,128 67,874	94,485 78,086	123,606/ 102,154/ 23.6 percent

Source: State Statistics Committee 2005

A table setting out the growth in value of the Azerbaijani ICT market can be seen about (in the section on IT Products and Services). Statistics announced by the Ministry of Communications and Information Technologies stated that the total revenue of the communications market in the first half of 2006 was 250.1 million AZN or 223.55 million Euro, an increase of 27.1% on the same period in 2005. 29.3% of this income went to state-owned enterprises, while the remainder went to private companies.

[89] 'Communication of Azerbaijan' Statistical Yearbook (for 2005)

Political Intelligence

INTERNEWS

Belarus

Local Expert: Mikhail Doroshevich

Table of Contents

1 OVERVIEW 4
1.1 Regulation of Electronic Communications 4
1.2 Regulation of Electronic Services 4
1.3 Use of Information and Communication Technologies 5
2 GENERAL ENVIRONMENT 6
2.1 Influence of Stakeholders on Regulation and Policy....6
2.2 National Development Plan 6
2.3 Data Protection 8
2.4 Cybercrime and Spam 8
3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 10
3.1 Interconnection 10
3.2 Numbering 12
3.3 Rights of Way and Facilities Sharing/Collocation 13
3.4 Tariff Policy 13
3.5 Cost Accounting....14
3.6 Universal Service 14
3.7 Local Loop Unbundling 15
3.8 Leased Lines....16
3.9 Mobile Services....17
3.10 Satellite Services 20
3.11 Status of the National Regulatory Authority (NRA) 20
3.12 Licensing and Authorisation....21
3.13 Spectrum....23
4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 25
4.1 Digital Signatures....25
4.2 Payment Systems 25
5 USE OF ELECTRONIC COMMUNICATIONS SERVICES....26
5.1 Fixed Telephony Penetration 26
5.2 Mobile Usage 26
5.3 Cable Services....26
5.4 Computer Availability 27
5.5 Internet Access 27
5.6 Public Internet Access Points (PIAPs) 28

5.7 Wireless Internet Access 28
6 AVAILABILITY OF ONLINE SERVICES....30
6.1 E-Commerce....30
6.2 E-Government....31
6.3 E-Learning 33
6.4 E-Health....33
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY....34
7.1 Fixed Networks 34
7.2 Mobile Networks 35
7.3 Cable Networks....35
7.4 Internet Access Networks 36
7.5 Satellite Operators 36
7.6 Production of IT Services....37
7.7 Financial Development of the ICT Sector 37

1 OVERVIEW

The current independent state of Belarus was declared in 1990 and officially established in the following year. It has a population of 9.8 million people with a land mass of 207,595 square kilometres. The GNI per capita was 1,752 Euro in 2005, based on World Bank figures. Belarus is a republic with a President and a bicameral legislature. The country consists of seven principal administrative subdivisions: six provinces and Minsk, the capital.

1.1 Regulation of Electronic Communications

There is a high level of government involvement in the electronic communications sector and there is no independent National Regulatory Authority. Interconnection is regulated by the Ministry of Communications. Numbering resources are also managed by the Ministry of Communications. Freephone, national local call and premium rate numbers are not available. Number portability is also not available. VoIP is only available through the incumbent.

Beltelecom[1] (the state monopoly fixed line operator) has exclusive rights in the fixed line sector and the state also has significant levels of ownership in the mobile sector, limiting the possibilities for non-discriminatory access to network elements.

No efforts towards tariff rebalancing have yet been made and there is no cost accounting mechanism. The revised Law on Telecommunications, due to come into force shortly, will introduce basic aspects of universal service regulation, such as a universal service fund.

Despite the legislative framework being very limited in this regard, some local loop unbundling is undertaken, although only for Internet access services. Beltelecom is automatically the owner all the leased lines in the country. There is no specific data protection law in Belarus, nor are there any plans to introduce one. Belarus has not signed any international conventions on this topic.

1.2 Regulation of Electronic Services

Legislation regarding the use of electronic documents and digital signatures in Belarus is not complete and therefore digital signatures cannot be used for contractual arrangements in the country.

The liability of intermediaries for illegal content has not been directly addressed in Belarus. However, the limited reports of illegal online activity in Belarus indicate that the legal framework and capabilities of national authorities are quite robust. An action plan

[1] http://eng.beltelecom.by/

for introducing comprehensive intellectual property rights legislation is currently being implemented.

In addition, the Minister for Information has raised the issue of imposing offline rules to online services, particularly with regard to news services. No more detail is currently (December 2006) available on this point.

E-payment systems are at a very rudimentary level, partly due to the weak legislative framework. Banks are, however, beginning to offer basic online access to account information. Only twelve out of twenty-nine banks registered in Belarus issue bank cards, which limits demand for e-commerce services.

1.3 Use of Information and Communication Technologies

According to official sources, fixed network penetration in Belarus currently stands at 35 percent,[2] which is approximately at the same level as neighbouring new EU Member States. Mobile penetration is slightly lower than in neighbouring EU countries at 56,5 percent.[3] The most recent official data on Internet penetration (from 2005) showed a penetration rate of 34.8 percent.[4] As with the other countries in this report, there is a strong divide between urban and rural areas with regard to fixed penetration and Internet access.

Despite the weak legal framework for electronic commerce and the lack of bank cards in circulation, there is some growth in online services, although this is very heavily concentrated in the Minsk region (200 of the 219 online services identified in the course of research for this study).

E-government services are at a fairly basic level, although regional authorities do provide some interactivity, such as searchable databases, downloadable files and e-mail publications.

[2] Based on data presented by the Belarusian Minister of Communications and Informatisation in April 2006.

[3] Data from Onliner Report, Nov. 1 2006 http://onliner.by/cont/onl_market06_10.pdf

[4] Data from ITU Statistics 2005

2 GENERAL ENVIRONMENT

2.1 Influence of Stakeholders on Regulation and Policy

Generally speaking, stakeholder groups have little influence in the development of policy in Belarus. One exception is Infopark,[5] which is an association of IT companies, predominantly software developers, which aims to influence decision-making, promote competition and safeguard the best interests of its members. This association has created the "Generation of Professionals"[6] project to improve the training and recruitment of young IT specialists through identifying their needs and providing a link between industry and educational establishments. The association also focuses on influencing education policy in order to ensure that the manpower needs of the IT sector will continue to be met.

2.2 National Development Plan

The State Programme for the Informatisation of the Republic of Belarus was originally launched in 2002, to cover the period 2003-2005 (with a second stage planned for 2006-2007). The plan's goals are as follows:

- Development of the telecommunications infrastructure and creation of access centres;
- Development and modernisation of ICT and the creation of an export-oriented branch of the IT industry;
- Enhancement of the legislative framework and system of state regulation in the sphere of informatisation;
- Improvement of State bodies' use of ICT;
- Development of informatisation processes in all sectors of the economy, including the creation of a system of electronic trade and logistics;
- Development of training and retraining programmes for ICT specialists and to improve the qualifications of users;
- Assistance in the development of culture and mass media by means of ICT;
- Modernisation of the system of information security, taking into account the national Concept of National Security (most recent update July 2001).

The project began slowly, with only 50 percent of the planned budget for 2003 being spent in that year. By the end of 2005, the programme was still somewhat behind schedule: Telegeography[7] reports that, in November 2005, of the 102 active initiatives proposed under the State Programme, only 10 were fully funded by the programme.

[5] http://www.infopark.org/

[6] http://www.infopark.org/main.aspx?uid=79080

[7] "E-Belarus Programme Behind Schedule", 4 November 2005
http://www.telegeography.com/cu/article.php?article_id=9768&email=html

It was decided in 2004 to extend the original programme for two further years in order to ensure that its goals could be achieved. In April, 2006, the Minister for Informatisation and Communications announced plans for 51 new projects to be launched under this programme, with BYR 54 billion (20.7 million Euro) allocated for them, divided between 29.9 billion (11.5 million Euro) for research and BYR 24.2 billion (9.2 million Euro) for capital investments.

In September 2006, the Ministry of Communications and Informatisation of the Republic of Belarus announced plans to invest 68.2 billion BYR (26,2 million Euro) in rural telecommunications infrastructure in 2006. In 2005, investments into rural telecommunications infrastructure totaled 77 billion BYR (29.6 million Euro).

Speaking at a press conference held on September 5, 2006, Belarusian Deputy Minister of Communications and Informatisation Vladimir Tesliuk, said that 67,4 billion BYR (25.9 million Euro) has been invested in telecommunications infrastructure development in the period January - July 2006. Mr. Tesliuk stated that state budget allocations totaled 17.34 BYR billion (6,65 million Euro), while 47.64 billion BYR (18,3 million Euro) were invested by private enterprises.

Also in the period January-July 2006, state–owned fixed line monopoly Beltelecom invested 39.9 billion BYR (15,3 million Euro) in rural infrastructure development, including 10.8 billion BYR (4.1 million Euro) allocated to extension of the phone network.

During the same period, mobile communications operator Velcom has invested 25.5 billion BYR (9,8 million Euro) in the extension of its network in rural regions.

The State programme for the development of rural regions for the period 2006-2010, includes plans for the roll-out of more than 30 thousand of fixed telephone lines and to achieve a fixed penetration rate of 25,8% . In rural areas, the percentage of mobile and fixed telephone users should total 93%.[8]

On October 23, 2006, the Belarusian Council of Ministers adopted the updated list of the State Informatisation Programme Projects for 2003–2005 and up to 2010 (Electronic Belarus) which includes 100 projects. At the end of 2005, from the original programme only six projects had been completed and 52 not yet started.

On the same day, the Belarusian Ministry of Communications adopted the Telecommunications Development programme 2006-2010.

The Programme objectives are:

- to further the development of telecommunications services for all the categories of users;
- to create national informatisation networks in order to provide access to information for all the citizens of the country.

The Programme defines the following priorities:

- preparation for the accession of Belarus to the WTO;
- extension of data transmission networks;
- digitisation of the public phone network;

[8] http://www.e-belarus.org/news/200609061.html

- introduction of up-to-date information technologies;
- introduction of new telecommunications and mail services based on new ICTs.

In particular, a target of 80 percent digital automatic exchanges has been set, and to increase the number of fixed telephone lines up to 3,609,300 (38 per 100 inhabitants). The government is planning a 7,200km extension to the national fibre optic network. Broadband capacity of the national operator's network (Beltelecom) is expected to reach 240,500 ports by the end of 2010. The number of mobile communications network subscribers is planned to reach 8 million.

There are also plans to create 3G mobile communications networks. The 1885 - 2025 MHz and 2110 - 2200 MHz radio frequency bands are to be allocated for IMT-2000 communication providers on competitive basis.[9]

2.3 Data Protection

There is no special law on data protection in Belarus. The 1995 Law on Informatisation does not regulate the processing of personal data or the movement of data. Consequently, there is no data protection authority. There are no current or future plans for data protection in general, or specifically with regard to the online environment.

The government is, however, endeavouring to improve legislation in the area of consumer protection.[10] The 2005 Law on Telecommunications introduces one provision regarding the confidentiality of telephone conversations and provides legislative underpinning for the rights and obligations of investigating authorities. The Government also plans to sign the Council of Europe Convention on Automatic Processing of Personal Data.

2.4 Cybercrime and Spam

Belarus has acceded to the UN Optional Protocol of the Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography, but has not signed the Council of Europe Cybercrime Convention (which is open to non-members). Belarus is a member of the World Intellectual Property Organisation.

In 2004, together with US law enforcement agencies, the Belarusian law enforcement authorities broke up an Internet child pornography operation based in Minsk. This suggests that national legislation is sufficiently robust to deal successfully with such cases and that law enforcement agencies in the country are prepared to act in such circumstances.

[9] Source: http://www.e-belarus.org/news/200610311.html

[10] You can access the Concept on the Improvement of the Legislation of the Republic of Belarus (in the local language) at: http://www.sovrep.gov.by/images/page47/plan_zakonoproektov.htm. An English summary can be accessed at http://ncpi.gov.by/ConstSud/eng/mess04.htm.

The Belarusian Council of Ministers adopted a Programme for Intellectual Property Rights Protection for 2004 to 2005 (Resolution N472). The main objective of the programme is to improve the country's intellectual property rights legislation. The framework of the programme includes the drafting of laws concerning brands, patent fees and duties, as well as amendments to the laws on copyright. The programme also states that Belarus intends to enter the relevant international treaties on trademark and patent law. There is no new official information on how successful this project has been.

The issue of the liability of ISPs has not been addressed in any detail in Belarus.

An attempt was made to prohibit the sending of unsolicited e-mail. However, this was successfully opposed by various groups, including NGOs, who felt that the measure was unduly restrictive on free speech.

3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS

3.1 Interconnection

There are four major documents regulating interconnection:

- Law On Communications (2005);
- Regulation on Communication Operators' Interconnection on the Territory of the Republic of Belarus (1999);
- Regulation on Supervision Procedures for Telecommunication Networks Connected to General Use Networks (1997) by the Ministry of Communications and Informatisation; and
- Regulation on Land Mobile Radio Communications Network Creation (1995) by the Ministry of Communications and Informatisation.

None of the above regulations require the publication of an RIO by the incumbent, nor do they mandate carrier selection or carrier preselection. The Regulation on Communication Operators' Interconnection on the Territory of the Republic of Belarus (1999) should have led to a situation where each operator signed interconnection agreements with every other operator connected to the public switched telephone network. However, the Regulation on Interconnection does not describe any clear procedures or rules for this situation, as it only envisages connection through/via Beltelecom. As a result, a number of conflicts regarding interconnection issues have arisen between telecommunications operators, although all of these have been resolved after intervention by the Ministry of Communication. The new Law on Telecommunications (2005) makes the situation clearer, insofar as it specifies only interconnection via the incumbent (article 38).

According to licence terms, all incoming calls should be free of charge for customers, as is normal practice in most countries. This means that MTS (a mobile provider) should pay for termination of its clients' calls to Velcom (another mobile provider) clients. However, in practice, the two operators do not have a direct channel interconnecting them and both need to use the Beltelecom network. In this case, therefore, MTS has to pay both Beltelecom (as owner of the transit network) and Velcom (as the terminating operator).

At present, six interconnection agreements between mobile operators are in place (with some operators connecting indirectly through Beltelecom). There are four mobile operators in the market, Velcom,[11] Mobile TeleSystems,[12] BelCel[13] and BeST.[14] The Ministry of Communications has been notified of, and has examined, all the interconnection agreements.

[11] http://www.velcom.by

[12] http://www.mts.by

[13] http://www.belcel.by

[14] http://www.best.by/

Mobile Call Termination Charges

Mobile Operator		Minimum BYR/min	minimum EUR/min	maximum BYR/min	maximum EUR/min
MTS					
	Call termination charges paid to Beltelecom for fixed line termination	180	0.0691	350	0.134
	Call termination charges paid to other mobile networks	180	0.0691	350	0.134
Velcom					
	Call termination charges paid to Beltelecom for fixed line termination	170	0.065	450	0.17
	Call termination charges paid to other mobile networks	170	0.065	450	0.17
Diallog					
	Call termination charges paid to Beltelecom for fixed line termination	170	0.065	230	0.088
	Call termination charges paid to other mobile networks	170	0.065	230	0.088
BeST					
	Call termination charges paid to Beltelecom for fixed line termination	94	0.036	163	0.063
	Call termination charges paid to other mobile networks	163	0.063	163	0.063
Beltelecom					
	Internal Beltelecom fixed/fixed call termination charges	7.67	0.0029	58,3	0.022
	Call termination charges paid to mobile network providers.	129	0.0495	258	0.099

The Ministry of Communications and Beltelecom RSA govern the IP-telephony market, and VoIP is currently only available (legally) through the incumbent. This situation has resulted in the appearance of clandestine IP-telephony operators. The organisers of one clandestine exchange node were recently convicted of illegal business activity and fined. It is, in theory, possible to terminate VoIP calls on the incumbent's network; however, this has proven very difficult in practice. In one case in 2005, two Belarusian citizens

used 225 SIM cards purchased from consumers to transfer calls from a VoIP link onto mobile networks, thereby bypassing the Beltelecom international calls monopoly.

Revenue sharing is not available for ISPs and international IP links are only available through the incumbent's network.

3.2 Numbering

Procedures for managing the national numbering plan are laid down in Article 16 of the 2005 Law on Telecommunications. The numbering plan is approved by the Council of Ministers of the Republic of Belarus.

Numbering resources are equally available to all mobile communications service providers. The Ministry of Communication and Information is responsible for allocating numbering resources in all cases, including when a mobile operator applies for an extension of numbering space.

State-owned Beltelecom, the incumbent fixed telephony operator, holds the monopoly on access to fixed numbering ranges, as the only provider of fixed line telephony services in Belarus.

According to the Ministry of Communications' regulations, only Beltelecom is authorised to provide VoIP services. When the Ministry of Communications issues licences to ISPs, it is expressly stipulated that they cannot provide VoIP services and, consequently, no numbering services are available to them for this purpose. VoIP will not have a numbering range but will be permitted in certain circumstances, such as for domestic calls and connecting branches of the same company.

There are no plans to introduce mobile number portability in the foreseeable future. There is no fixed line number portability in view of Beltelecom's monopoly. However, on November 2006, Sergei Poblaguev, BeST Deputy General Director, suggested that portability issues be discussed.

Non-geographic numbers (premium rate, etc) are not available, with the exception of so-called "green numbers", which are toll-free and paid for by the receiving party. These have been available since May, 2003.

Changes and additions to the numbering plan can be made during the approval process of a new communications system (a new GSM operator, for example), when the relevant part of the numbering plan has been exhausted, or if it is deemed technically necessary. Withdrawal of numbering resources can take place if a limited licence expires, if the communications service provider asks for the withdrawal, if the numbers have not been used in the two years since allocation, or in the event that the conditions of use of the numbers have been breached.

A new numbering plan was announced in early 2006, which plans to eliminate the initial 0 in city codes, value-added services, information services and taxi services. New shortcodes beginning with the digit 1 will be introduced for special services in 2007. The

new interregional and intercity numbering plan will come into effect in 2008. The use of 112 will also be extended to cover other emergency services in addition to the fire service.

All operators in Belarus adopted the new numbering plan since October 1, 2006. Old seven figures telephone numbers can still be used, but only for intra-network calls. For connections between different operators' networks, only international call formats are to be used. To connect to the fixed telephone network, seven figure numbers are to be used preceded by (#).

3.3 Rights of Way and Facilities Sharing/Collocation

Mobile and Internet providers generally do not have equal rights to the incumbent telephony company, Beltelecom.

There are no alternative infrastructures to provide effective competition in telephony and Internet access. ISPs' copper lines are carried over the Beltelecom local exchange, even when an ISP finances and builds out the line itself. This creates problems with regard to efficiency and competition. However, all ISPs pay Beltelecom under equal conditions.

ISPs pay a monthly conduit rent of 50US$/km (41.32 Euro approximately) for a fibre-optic cable. In order to reduce overall costs, ISPs can route some of their fibre optic cables through the local Beltelecom exchange.

The application procedure for the installation of fibre optic cable by ISPs is as follows:

- A provider applies to Beltelecom requesting details of network's technical requirements.
- The provider gets a licence for design development and can prepare a network design.
- The design developed by the provider undergoes examination by experts in the Ministry of Architecture if it is a national network, or in local administrations if it is a local project. Such a study costs from 50US$ to 250US$ (41 to 206 Euro), depending on the complexity of the project.
- The provider submits its project and applies for a licence from the Ministry of Communications.

There are no facilities sharing or collocation obligations imposed on mobile providers. It is not permitted to build masts on cultivated land or forestry in Belarus.

3.4 Tariff Policy

RSA Beltelecom holds the monopoly for fixed line communications. The Ministry of the Economy establishes tariffs for Beltelecom, based on subsidising local fixed telephony communications. In order to preserve revenues and subsidise local services, high prices

are set for international calls and for leased lines. The new Law on Communications from 2005 maintained Beltelecom's exclusive rights for international and intercity telephony. The tariff imbalance, which sees Beltelecom obtain 60 percent of its profit from international calls,[15] makes competition in the local market difficult. Line rental is approximately 20 percent of cost.

The state also regulates prices for services provided under the universal service provisions of Article 14 of the 2005 Law on Electronic Communications.

There have not yet been any efforts to reduce or eliminate price differences between local, regional and national calls, nor are there any plans to implement rebalancing in the foreseeable future.

Beltelecom: Cost of a Three-Minute Call (local, regional, international)

Beltelecom	Min (Eur/3min)	Max (Eur/3min)
Local	0.0087	0.0087
Regional	0.02257	0.067
International	0.344 (Ukraine)	5.42 (Bangladesh)

It is estimated that local prices cover approximately 96 percent of costs in urban areas and 30 percent in rural areas. Furthermore, at current rates, it will take 25 years to recoup the cost of installation of digital exchanges in urban areas and 60 years in rural areas.[16]

3.5 Cost Accounting

In the absence of an NRA and liberalisation (planned for 2007), there is currently neither a pressing need for a comprehensive cost accounting system in Belarus, nor an independent body to oversee its implementation.

Obligations are imposed by the 2005 Law on Telecommunications for communications providers to inform consumers of the accounting process used to charge for their services. Similarly, Beltelecom is under an obligation to correctly account for international traffic, in line with international agreements.

3.6 Universal Service

The 2005 Law on Telecommunications[17] states in Article 43 that the list of universal services, as well as terms and procedures for rolling out these services, is to be

[15] Based on data from Beltelecom's 2004 annual report. See http://www.beltelecom.by/company/about/annual2004

[16] DELO 2006, "Connected One Network", Issue N 4(156), 2006. Pages 11-13

[17] The draft law was approved in second reading by Parliament on 21 June 2005 and will enter into force after being signed by the President.

regulated by the Council of Ministers. Universal service is described as the State-guaranteed provision, to all users on the territory of the Republic of Belarus, of commonly used electronic communication at acceptable tariffs (currently applicable to fixed line services only).

Article 27 of the Law says that a universal service fund should be formed on the basis of telecommunications operators' payments. The procedures, budget and contribution rates are to be regulated directly by the President of Belarus. Universal service providers other than Beltelecom may be appointed, although the new Law does not go into detail about how this would happen in practice.

The 2005 Law does not mention anything about calling line ID, competition in directory services or measures to ensure services to disadvantaged users. In general, while the draft law does address universal service more than previous legislation, its scope is still not as broad as universal service legislation in the EU.

Draft legislation on universal service specifically was prepared in early 2006. Various funding options have been discussed, including a 1.5 percent levy on revenue and "social obligations" (such as building rural payphones) being included in licence terms. Final proposals are expected in early 2007.

3.7 Local Loop Unbundling

In Belarus, there are no legal requirements for local loop unbundling. The Ministry of Communications has not established policy in this sphere. Nonetheless, it is still possible for Internet access providers to use unbundling. The issue seems to be solved on the basis of private agreements made between directors of local Beltelecom branches and individual ISPs to rent space in automatic telephone exchange premises. The decisions are made solely by local branch directors, with outcomes varying depending on the relationships with specific ISPs.

In Minsk, internal directives of Beltelecom and MGTS (City Telephone Network Operator, a part of Beltelecom) are used for the decision-making process. Clearly this procedure gives little or no certainty to other operators, making planning, budgeting and negotiation much more difficult for ISPs.

Costs are shared between the unbundling operator and the incumbent (leasing of space, electricity, etc). The incumbent does not permit adjacent/remote collocation to ISPs if there is a lack of space and there is no offer for shared access. Separate rooms are required for competitors' equipment. There is no competition in the back-haul market.

Due to Beltelecom's monopoly for voice services, unbundling is only available for provision of Internet access services. Overall, the study team estimates that fifteen to twenty thousand lines have been unbundled, based on discussions with industry.

In August 2006, a conflict arose between Beltelecom and ADSL service providers. Beltelecom wished to increase rates for unbundled lines and maintenance services at the same time as introducing its own ADSL services. Following three months of dispute, the parties reached a compromise and all competitve providers have signed new agreements with Beltelecom. The monthly price for an unbundled lines is 18,700 BYR (7.18EUR), while the monthly maintenance fee increased from 14,060 BYR (5.4EUR) to 14,340(5.5EUR) BYR. However, the lead time has been reduced to 3 days.

3.8 Leased Lines

In Belarus, only RSA Beltelecom can connect leased lines, as the entire infrastructure in the country belongs to it. Therefore, other ISPs have to invest in the Beltelecom infrastructure in order to develop their own networks. If an ISP were to build out a leased line itself, the line would automatically become the property of Beltelecom.

In a situation where a monopolist owns the infrastructure and establishes the accounting schemes, neither the state-owned monopoly nor the Government have an interest in putting in place regulatory requirements for transparency, non-discrimination and cost-orientation.

Beltelecom charges for leased lines (per month)

Speed	Month
64kbps	US$150 / 124 Euro
2mbps	US$2,000 /1,652 Euro
34mbps	US$26,656 / 32,254 Euro

Taking the Minsk fixed line network as an example, leased lines are normally repaired within 24 hours.

The only technical limitation for interconnection between leased lines and public telecommunications networks is created by the lack of technical capacity in the Beltelecom infrastructure.

There are no specific regulations regarding the purposes for which leased lines can be used. However, Beltelecom has the right to unilaterally stop a leased line from being used, should it feel that this is appropriate.

There is no sector-specific legislation relating to leased lines in Belarus, nor is there any competition law in force. The whole field is regulated by Beltelecom and Ministry of Communications ad hoc decisions.
Beltelecom becomes the owner of copper lines once they have been built out by a competitor. If providers lay their own fibre optic lines, they pay duct rent to Beltelecom.

3.9 Mobile Services

At present, there are 4 mobile operators in Belarus: Velcom,[18] MTS,[19] BelCel[20] and BeST.[21]

Velcom was the first operator of a GSM-900 mobile digital standard in the Republic of Belarus and it began commercial operations on 16 April 1999. According to the company, its network covers 73 percent per cent of the country's territory (91.9 percent coverage of the population) and has more than 2.56 million subscribers. The Belarusian state holds a controlling stake in the company. The company has invested 310 US$ (256 million Euro) in the past seven years.

Mobile TeleSystems (MTS) is the second GSM operator. On 30 April 2002, MTS, a joint stock venture founded earlier that month, was awarded a licence allowing the company to use the 1800 MHz frequency. MTS says that its network covers 62 per cent of the country's territory (90 percent of the country's population) and has 2,975 million subscribers. MTS Belarus now operates a GPRS network which supports EDGE technology in Minsk (since August 21, 2006). MTS also provides EDGE services in all regional centers - Minsk, Gridno, Brest, Vitebsk, Mogilev, and Gomel (since October 2006).

Vladomir Karpovich, the former Belarusian minister for communications (2000-2002) was appointed by the Belarusian President as Director General of MTS in September 2005. MTS Russia recently offered to purchase the 51 percent share of the company owned by the government of Belarus for 350 US$ (289 million Euro), but this offer was rejected.

BelCel is a private CDMA2000 operator. Its main shareholders are Commstruct International and Beltelecom. Belcel's network covers 46.4 per cent of the country's territory (89.1 percent of the population). The number of BelCel subscribers now totals 100,000. The Belarusian President appointed Igor Bezruchonok (previously deputy director general) as director general of BelCel in September 2005. The company recently transferred all of its services to CDMA-450, shutting down its NMT-450 services.

BeST, a 100 percent state-owned operator, was launched in November 2004 following a decision by the Ministry of Communications and Information to end the then underway GSM licence tendering process. It is intended that BeST will focus on serving socially disadvantaged customers; it benefits from lower taxes to help it achieve this goal. According to Belarusian GSM operator BeST general director Mikhail Demchenko, the company is planning to extend its network to cover all the Belarusian cities with the population more than one hundred thousand to shortly put its one hundredth base station into operation .

[18] http://www.velcom.by/en/

[19] http://www.mtsgsm.by/

[20] http://www.belcel.com.by/

[21] http://www.best.by/

As of November 1, 2006, the BeST network covers territory inhabited by 46,4 per cent of the Belarus country's population , including 8 cities, and provides services to more than 13 thousand subscribers.

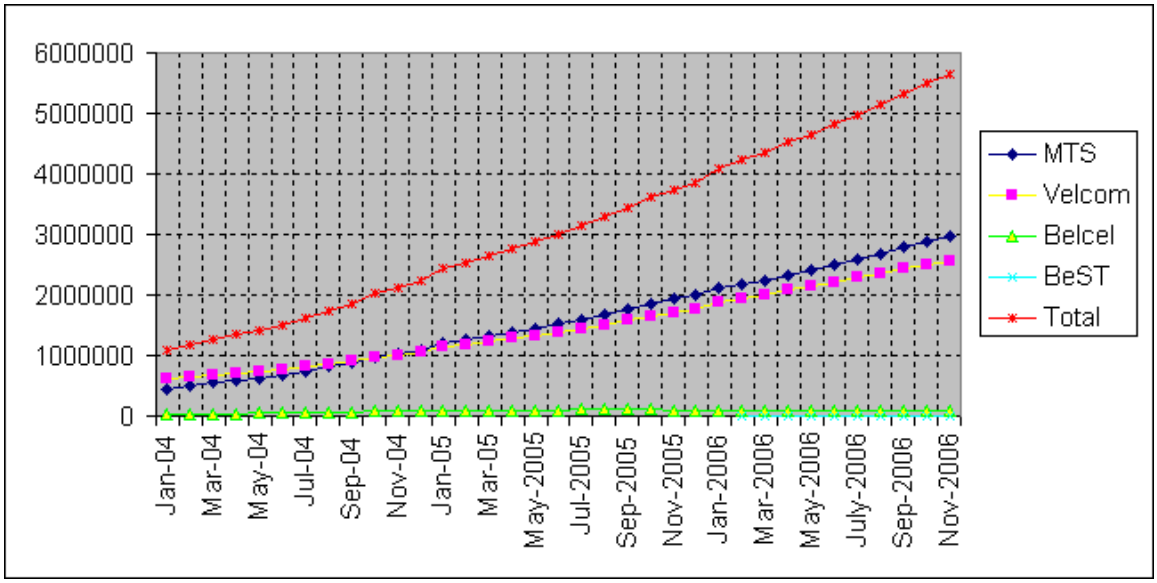
Some high-speed CDMA services are available from BelCel. No 3G licenses have yet been awarded.

There are no MVNOs on the market, although some industry experts had indicated to the study team that BeST may start to build its customer base initially as an MVNO. The current plan is for BeST to build its own infrastructure, although using towers erected by other operators.

In November 2006, there were 5,648,000 mobile phone subscribers in Belarus, which equated to 56.5 percent of the population[22] and representes a growth of 1.175 million users since the beginning of the year. According to the Telecommunications Development programme for 2006-2010, it is planned that by 2010 the number of mobile communications network subscribers will total 8 million.

Roll-out of infrastructure has not been as advanced as expected: for example, MDC (Velcom) has not yet covered 11 small towns in the Mogilev region as had been previously planned by the Ministry of Communications. Similarly, MTS failed to ensure planned coverage in 14 small towns in the Mogilev region and two border check points in Gomel region. Of the 200 base stations planned by MTS for the 2004-2005 period, only 109 were actually put into operation[23].

Mobile Subscriber Numbers 2004-2006[24]



There are no 100 percent prepaid services in Belarus, which is very unusual, particularly for a developing economy. This appears to be due to the stringent consumer registration obligations required by law.

[22] Total population is based on an official estimate of population growth based on 1999 census figures.

[23] See http://www.e-belarus.org for more information

[24] From e-Belarus.org

GPRS services are available in Belarus. Velcom offers GPRS services in three different price categories. The most advanced service "Velcom GPRS Web Plus" has a connection fee of 10,000BYR (3.83 Euro), with a monthly fee of 54,000BYR (20.71 euro) which includes 100Mb of downloads, with additional downloads are charged at 45BYR (0.017 euro). Statistics for the use of WAP/GPRS services are not available.

As mentioned above, Mobile TeleSystems (MTS) Belarus publicly launched its GPRS network. As of October 2006, MTS estimated that it had 200,000 potential GPRS users among its client base. Despite doubts previously expressed by MTS executives and its general director Vladimir Karpovich regarding the possible demand for the service, all the MTS's transceivers put into operation during the last two years support EDGE technology.

As an indication of mobile costs, Velcom charges 0.04 Euro per SMS, whereas a three-minute mobile-to-mobile call costs 5 times more.

Taking Velcom charges as an example, monthly fees range from 2,100BYR (0.085 Euro) for a "light" (low monthly fee with no roaming, no international calls and ten minutes of calls included in the fee) subscription to 11,350BYR (4.35 Euro) for a "standard" subscription (a higher monthly subscription with roaming, international calls and 20 minutes of calls included in the fee. As a comparison, the monthly subscription fee for a fixed line from Beltelecom is 1,345BYR (0.515 Euro).[25]

Fixed and Mobile Monthly Subscription Costs[26]

	Min (Euro) per month	Max (Euro) per month
Beltelecom (fixed)	0.6	0.96
Velcom	0	11,53
MTS	0	38.42
BeST	0	0
Belcel (Diallog)	0	15.36

Negotiations have taken place between state representatives and Siemens and Ericsson for 4G services. Also, the government has confirmed that MTS and Velcom are testing new equipment for the roll-out of 3G services, even though no licences have yet been issued. Velcom has launched 3G services on a small scale, with equipment provided by Ericsson and has launched EDGE services in three regions. MTS has also started testing UMTS and HSDPA and has been providing MMS services since March 2006. After the testing period, the equipment has been dismantled and returned back to the manufacturers. Positive test results were the reason for MTS' application (on November 1, 2006) to the Ministry of Communications and Informatisation for permission to establish and operate 3G networks.

[25] From the Beltelecom website – www.beltelecom.by
[26] http://www.e-belarus.org

3.10 Satellite Services

Beltelecom and Intersputnik[27] have conducted negotiations on the creation of a joint stock company that could provide modern multimedia satellite communication services in Belarus. An agreement was reached for Intersputnik capacity to be used for providing satellite multimedia services on the territory of Belarus.

Intersputnik provides services to telecommunication operators and to corporate clients using LMI-1 (Lockheed Martin Intersputnik joint stock company), Express-A and Express-AM (Russia) satellites. Intersputnik manages the marketing and provision of Eutelsat satellite telecommunications system services (23 satellites) and Gazkom system (Jamal-200 satellites) services. The Intersputnik system consists of more than 150 ground base stations for long distance communications and more than 1500 ground base stations in VSAT and television distribution networks.

Currently, the numbers for satellite television are low, with less than one-twentieth (4.3 percent) of Belarusians having access to a satellite dish for television. At the same time, terrestrial television services are available to 97.7 percent of the population, whereas only 43.4 percent have the possibility of a cable connection for television and 88.9 percent have radio.[28]

8.8 percent of television sets receive their signal with the help of an antenna on the television or elsewhere in the room; 54.1 percent with an antenna on the roof/outside window; 2.5 percent with an individual satellite dish; 0.9 percent with a shared satellite dish.

0.2 percent of the respondents to the TBM survey said that they received international and regional TV programs via Eutelsat, 0.3 percent via Astra, 0.3 percent via Telecom 1, 0.1 percent via Hot Bird 1, 0.8 percent via NTV+, and 0.7 percent named other satellite services. 1.5 percent did not know the name of their satellite provider. Only IP downlink and television are available to home and business users.[29]

IP downlink and IP telephony connections are available only via VSAT (provided by a division of Beltelecom). However, the service is extremely expensive.

3.11 Status of the National Regulatory Authority (NRA)

There is no nominally or functionally independent National Regulatory Authority in Belarus.

According to the 1994 Law on Communications, the national regulatory body is to be authorised by the Council of Ministers. In 2004, the Council of Ministers issued a decree entitling the Ministry of Communications and Informatisation of the Republic of Belarus

[27] http://www.intersputnik.com/

[28] Data produced by Belarusian NGO TBM under contract from the Ebert Foundation.

[29] ibid.

to regulate telecommunications in the country. The 2005 Law on Telecommunications reserves *inter alia*, spectrum policy, approval of the numbering plan, and tariff regulation for designated services, as policies to be determined by the Belarusian state.

Article 40 of the 1994 Law is devoted to the national telecommunications operator. At present, state-owned Beltelecom is the national telecommunications operator in the Republic of Belarus. Beltelecom is responsible for ensuring its own functioning and development as a "*republican, state-owned association*" and that it operates in compliance with state national development programs and respective industry schemes for implementation of government plans for infrastructure development.

The Ministry of Economy will have responsibility for establishing a cost accounting system.

3.12 Licensing and Authorisation

According to the 2005 Law on Telecommunications (Articles 6 to 12), undertakings in the telecommunications sphere should be licensed. The list of activities subject to licensing and bodies authorised to issue licences are determined by Presidential Decree 1387 of 14 June 2003. The list of state regulatory bodies is listed under Article 6 of the Law and includes the President, national and local councils of ministers, executive, state and local bodies, the State Commission for Radio Frequencies and the Minister for Communication and Informatisation. Article 7 gives the President overall control of regulation in the field of telecommunications, while Article 8 delegates the management of policy issues to the Council of Ministers.

Licences for telecommunications activities are issued by the Ministry of Informatisation and Communications. The Presidential State Security Centre issues licences concerning data processing and use of digital signatures. The Presidential State Security Centre and the Committee for State Security (KGB) jointly issue licences in the sphere of cryptography.

In June 2005, the Ministry of Communications and Informatisation acquired the right to issue 10-year licences. Before this, licences expired after a five year period, although the average time it took to recover investment was seven years. This acted as a constraint on active investment in this sector.

The State Commission on Radio Frequency issues licences for use of radio frequency for five-year periods.

According to the Council of Ministers Regulation on Licensing in Telecommunications (2003) (updated in 2005 by the Presidential Decree mentioned above), the following activities require licences:

- use of radio frequencies;
- operation of telecommunications systems; and
- the design, construction and operation of networks.

According to the Regulation, the Ministry of Communications and Informatisation is authorised to restrict the number of licences for the construction and running of networks and systems of international and intercity telecommunications, fixed and mobile radio communications, and satellite fixed and mobile communications.

ISPs' licences include the requirement not to use their own international links. The licences issued by the Ministry of Communications and Informatisation state that an ISP is obliged to rent either Beltelecom international links or Delovaya Set (a joint venture with Beltelecom, which leases international links to third parties). However, the Minister for Communications and Informatisation has indicated that this situation will change when the market is liberalised in 2007, although it is intended that all existing international infrastructure will remain within Beltelecom ownership. The extent of the planned liberalisation remains unclear, as minimal measures, such as removal of Beltelecom's monopoly, have so far been announced.

According to the Regulation on Licensing in the Telecommunications Sector (20.10.2003 N 1387), Internet service providers and fixed operators are to submit the following documents when applying for licences:

- budget and the balance for the previous year (for companies already in operation);
- specifications regarding the equipment necessary for providing services;
- copies of certificates for communication equipment corresponding to the National Certification System of the Republic of Belarus;
- information about workers' qualifications (including their diplomas, certificates, etc); and
- a list of official technical requirements for the provided services and operations.

The price for an ISP licence is nominal; however documentation and design preparation are expensive.

In addition to the documents listed above, mobile operators are to submit:

- copies of certificates for the equipment;
- approval by the authorities for the siting of transmission equipment;
- necessary calculations for protection zones around transmitters;
- service zone calculations in agreement with BelGIE, a subdivision of the Ministry for Communications
- a copy of the resolution for transmission; and
- agreements with local bodies engaged in television and radio broadcasting.

A mobile operator licence does not have a fixed price. MTS paid 5 million US$ (4.13 million Euro) in 2002 for its licence, whereas the state-owned GSM operator BeST paid 100 Euro for its licence in 2005.

3.13 Spectrum

In Belarus, the State Commission for Radio Frequencies (consisting of the Ministry of Defence, the Ministry of Internal Affairs, the KGB and other security agencies) is authorised to oversee spectrum management and allocation, while the Inspectorate of the Republic of Belarus for Electronic Communication supervises the activities of operators and providers.

The Commission was founded in 1994, in accordance with the Law on Telecommunications. The Minister of Informatisation and Communications heads the Commission. Representatives of more than twenty governmental bodies, including the Presidential Administration and National Congress, are members of the Commission. There have been no significant consultations with industry and other stakeholders so far on spectrum policy in Belarus.

The Commission allocates radio frequencies according to the National Table of 9Khz-40GHz Radio Frequencies. The Table is frequently updated by the Commission. The Commission recently adopted a new table, which takes into account 790-2500 MHz frequencies. The Commission is currently working on the table for the ranges of 2.5-10 and 10-27 Ghz.

The Law on Telecommunications, which was signed into law on 2 August 2005, is intended to be a preliminary step towards spectrum liberalisation. Article 15 (on radio frequency spectrum) states that, as radio frequency is a scarce natural resource, all users should pay for it, including the military and police. This provides a basis for radio frequency trading and equal terms for all users, with centralised government control. According to expert assessments, that will allow effective distribution of spectrum. At present, 40.2 percent of radiofrequencies, which fall within the range of 9 Khz - 10 Ghz are controlled by military agencies; 57.05 percent are operated by military and civil agencies, among which 19 percent are used by civil agencies solely. It is expected that the new legislative framework will stimulate redistribution of frequencies.

A new regulation on radio frequencies was adopted in April 2006, although the overall distribution of frequencies between public and private organisations appears to be unchanged. A fee is being imposed by the new legislation in order to promote more efficient use of existing frequencies.

According to the Presidential Decree #240 "On payment for radio-frequency spectrum usage" signed on April 18, 2006, an annual payment for radio frequencies is to be introduced in Belarus after January 1 2006.

Annual and non-recurrent fees are calculated from 1 Euro for 1Mhz frequency used during a year by one radio electronic device covering 1 square km. The rate also depends on the purpose of broadcasting, the technologies used, emission band, commercial value, service area, location and time.

Annual payments for frequencies used by governmental institutions, and national security, bodies and emergency services is a nominal 100 Euro. Annual and non-recurrent payments are transferred to the national budget.

Public use of Wi-Fi (i.e. not used in a completely domestic or private office environment) requires a licence in Belarus. The licensing process requires the preparation of a technical dossier. The price for putting together such a dossier is approximately 1,000US$ (846 Euro). The licence is issued, at the earliest, half a year after the application. If a business wants to use Wi-Fi in order to connect two geographic locations, Beltelecom has to confirm that the state monopoly is technically unable to provide the connection. A plan to permit unlicensed use of Wi-Fi was approved and subsequently withdrawn.

4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES

4.1 Digital Signatures

Legal provisions for digital signatures are set out in the Law on Electronic Documents, which was adopted in 2000. This Law is the major document regulating Internet security issues in Belarus and covers requirements for electronic documents, security of e-documents, and the rights, duties and liabilities of participants in legal relations arising in the field of electronic document circulation.

There have been problems with the functioning of Certification Centres. These problems remain unsolved, as the order and conditions of certification have not yet been determined. The use of electronic digital signatures, the order of electronic transactions, and the responsibility of participants have also not been properly resolved. These problems, together with the fact that it is not possible to use credit/debit cards for online purchases in Belarus, means that offline payment methods are needed for online transactions.

4.2 Payment Systems

At present, Belarusian banks are developing financial services that enable clients to handle their bank accounts remotely. All the major banks have now introduced basic remote banking systems for their clients (only available to business customers). The banks are at the informational Internet-banking stage; in other words, they have installed an elementary information retrieval system for clients.

Electronic payment systems are therefore at a very early stage of development in Belarus. On 29 September 2005, the Belarusian National Bank issued a regulation concerning the establishment of a technical coordination centre for e-money processing services – the BelCard[30] Payment System. This aims to develop unified technical solutions for electronic money circulation and to reduce the cost of using electronic money systems.

Infopark[31] (association of IT developers) has been lobbying for a more comprehensive legal framework for electronic payments. Currently, it is not legally possible to provide mobile or online banking to residential users.

[30] http://www.belcard.by/

[31] http://www.infopark.org/

5 USE OF ELECTRONIC COMMUNICATIONS SERVICES

5.1 Fixed Telephony Penetration

In April 2006, the Belarusian Minister of Communications and Informatisation, Vladimir Goncharenko summarised the latest developments in the sphere of fixed telephony at the TIBO2006 International Congress[32] held in Minsk. According to the data presented, fixed telephone line density is 35 per 100 inhabitants (38.7 in urban areas and 25.2 in rural areas). On average, 89 households out of 100 had fixed-line telephone access (101.2 lines per 100 households in urban areas and 63.1 in rural areas), a rate that is similar to that of Lithuania and Poland. Some 60 percent of automatic telephone exchanges in the country are digital.

By 2010, 80% of exchanges will be digital. By then, it is planned that there will be 3.4 million telephone lines in service.

By the end of 2006, all telephone exchanges were to be replaced by electronic ones through a phased upgrade programme. This programme had not been fully completed as of December 2006. Since January 2005, Ericsson has supplied equipment worth over 2.5 million Euro to Beltelecom. More than 430,000 AXE-10 lines have been sold by Ericsson to Belarus. According to information from Ericsson's marketing research department, Ericsson equipment supplies to Belarus in January-August 2005 had doubled as compared to the whole of 2004. In August 2005, Ericsson and Beltelecom signed a further contract for the supply of equipment to modernise Beltelecom's fixed telephony market. Within the framework of the new contract, Ericsson is to supply an AXE switchboard for the Gomel city telephone network.

5.2 Mobile Usage

Mobile penetration is currently at 56.5 percent[33]. GPRS services are provided by 2 operators – MTS and Velcom.

5.3 Cable Services

In a 2003 World Bank survey, cable penetration in Belarus was presented as follows:

Cable Penetration in Belarus

Variable (only 1 option out of 4 was possible for each region)	Belarus (%)	Minsk (%)	Regions (%)
No cable services are available	30	30	50

[32] http://tc.by/eng/tibo/

[33] Data from Onliner Report November 1 http://www.onliner.by/

Cable penetration is below 5% of households	70	50	50
Between 5 and 10% of households	0	20	0
Cable penetration is high, reaching 10% of households or higher	0	0	0

In the period January-June 2006, cable operator Cosmos TV increased its subscriber base by 74% and the company is aiming to have 10,500 consumers by the end of 2006. At present, Cosmos TV transmits 39 TV channels as well as providing broadband Internet access.

5.4 Computer Availability

There were 7.39 computers per 100 inhabitants in 2003.[34] More recent figures are not available.

5.5 Internet Access

As of 1 November 2006, 32 ISPs were active in the country. There are 23 dial-up metered and 23 dial-up unmetered services, 19 xDSL providers, 1 wireless ISP and three mobile providers providing Internet access.

Cost of Internet Access in Belarus (November 2006[35])

Type of Access	Min, US$/Euro	Max, US$/Euro
Dial-Up	0.046/0.038 (per hour)	0.7/0.58 (per hour)
Unmetered access	34.84/28.79	55.74/46.07
ADSL	0 (fully traffic-based pricing)	460/380 (average 50/41)
Hi-speed cable	5/4.13	590/487

The ITU indicated that in 2006 there were 3.394 million Internet users in Belarus, compared with 1.6 million in 2003. This accounts for about 34.9 percent of the country's total population.

Beltelecom is developing its broadband offering, supported by a doubling of international bandwidth from 465mbps to 1.5gbps. The Belarusian government also intends to support the building of a major national IP backbone.

A survey carried out at the beginning of 2005, conducted by the Belarusian Independent Institute of Socio-Economic and Political Research, indicates that people aged 20 to 24 (who constitute one third of the respondents) are the most active Internet users and that 50 percent of all respondents are university graduates. 45.6 percent of Internet users

[34] These statistics come from the ICT Infrastructure and E-Readiness Assessments in the Republic of Belarus Report, World Bank, April 2003.

[35] This table was put together using data from several main ISPs.

live in regional centres, of which 22.9 percent live in the capital city.[36] Moreover, the survey notes that 40 percent of Internet users are public sector employees. In short, the research concludes that the average Internet user in Belarus is a young governmental employee in his or her early twenties, with a university degree, living in a regional centre.

According to the survey conducted by MASMI BY in 2006, Internet users make up 33% of the population of regional centers in Belarus. An offline polling of one thousand respondents aged from 18 to 64 was conducted over a period of three months in Minsk and other regional centres. According to that poll, 65% of Internet users are 18-34 years old.. Men make the largest proportion of users, at 57%.

In Minsk Internet users (people who have used the Internet in the preceding three months) represent 38% of population, in Mogilev -18%, in Grodno -36%, in Gomel -26% in Vitebsk -39%, and in Brest -23%.

The top online services in Belarus (with more than 100,000 unique Belarusian visitors per month are tut.by (news, mail, search, forum, catalogue, classified advertisements and jobs), open.by (e-shops, search, mail, news, jobs) and onliner.by (mobile devices, forum).

5.6 Public Internet Access Points (PIAPs)

As of April 2005, there were 187 Beltelecom PIAPs in the country, which provides work stations for 732 people. 92 more workstations were planned to go into operation in 2005, with a planned increase of 115 for 2006-2007. There are also ten free wireless hotspots in the country, working in test mode.

5.7 Wireless Internet Access

On 31 March 2005, the Belarus Council of Ministers adopted Decision 346 establishing the Concept for Radio Communications Development in Belarus from 2005-2010. A key element of the plan is "*to organise the production of broadband radio access equipment [using] – IEEE 802.11 and IEEE 802.16 standards.*" Before this decision, the Government did not allow the 2.4 GHz band to be used for Wi-Fi. However, in practice, the import of equipment for private use could not be prevented, since Wi-Fi was a standard feature in laptop computers.

In order to coordinate the implementation of this Concept, the National Scientific Centre for Radio Communications Facilities is to be established. Moreover, to promote the modernisation of radio communications equipment production and to develop facilities, the Government is planning to reduce or possibly eliminate customs taxes for exporting radio communications equipment, software and related goods.

[36] See http://iiseps.by

In mid-2005 there were ten public Wi-Fi spots in Belarus, all in Minsk.

In June 2005 Siemens Communications and the Belarusian state mobile operator BeST signed a memorandum of understanding (MoU) for the delivery of a WiMax communications solution. The broadband radio network is part of a new initiative in Belarus designed to provide large parts of the population with Internet access. In addition, the Belarusian government wants to use the Wimax network for an innovative telemetering solution, which will enable all household consumption data for electricity, gas and water to be transmitted to a central billing system. In addition to the network infrastructure on the basis of its SkyMAX products, Siemens will deliver equipment capable of recording and transmitting the necessary measurement data.

Currently, Beltelecom is providing some public WiMAX services, using Ericsson equipment, while five other companies have applied for licences, although it appears unlikely that these will be successful. It is intended that WiMAX networks will cover the whole territory of Belarus, although standardisation issues may result in delays in the commercial operation of the programme.

The Ministry is seeking investors for wireless services in Belarus, estimating that Minsk alone will need 50 million US$(41 million Euro) investment.

In October 2006, Konstantin Tikar, Beltelecom General Director, announced that WiMax testing proved that its real technical specifications are far from those promised by manufacturers. In addition, some issues of equipment compatibility and frequencies allocation are to be settled.

6 AVAILABILITY OF ONLINE SERVICES

In 2003, there were approximately 600[37] companies, firms and organisations operating in the ICT market in Belarus in such fields as hardware manufacturing, assembly and sales; software development and delivery; and telecommunications and Internet services. The Computer News Online site included 494 registered ICT firms at the end of 2002.

6.1 E-Commerce

Despite the fact that the legal and procedural bases for e-commerce activities are yet to be fully determined, several Internet sites have sprung up, such as Minsk.shop.by and Real.shop.by, which are the two market leaders. The total quantity of registered e-retailers in search systems is more than 200 – this is original research put together as part of this project.

Minsk region - 200;
Vitebsk region - 5;
Brest region - 5;
Grodnensk region - 4;
Mogilev region – 4;
Gomel region – 1.

Belarusian e-retailers mainly sell household equipment, computers and their spare parts, CDs, video or audio tapes. As it is impossible to use credit or debit cards for payments, some non-electronic payment method needs to be used in order for a transaction to take place.

Other electronic shops offer a wide range of goods, for example, CD-ROMS, video cassettes, computers and spare-parts, online maps, food products, perfume (universum.shop.by), automobiles, tyres, domestic electronics, crockery, lamps, office equipment, children's goods, office supplies, furniture, personal hygiene products, cosmetics, sporting goods, flowers, plants, photography supplies, telephones, communication devices, audio and video devices, household equipment and tobacco.

Other services offered online include: medical services, flower arranging services, landscaping, connection to Velcom network, extension of pager service, sale and rent of real estate, etc.

6.1.1 Card Payments

[37] Extrapolated from the Computer News Online information to include state organisations.

Plastic bankcards were first introduced in Belarus in 1993. There are two types of bankcard currently in use in the country: the cards issued by the national payment system "BelCard" and those issued by international banking associations, VISA and MasterCard/Europay. In addition, banks issue their own debit cards.

Use of credit cards is very limited. Only 12 out of 29 banks registered in Belarus issue bank cards.

As of May 2006, the number of plastic credit cards in circulation totaled 3.35 million., including 3.017 million international payment systems cards and 333,000 BelCard payment system cards. According to Visa International, Belarusian holders of Visa card have performed 13 million transactions for the period June 2005 – June 2006, totaling 79 million US$ (65.3 million Euro).

In October 2006, Belarusbank issued its 2,000,000th debit card. The first plastic card was issued by Belarus bank in 1996. In 2002 the bank had 100 000 cards, in 2003 – 500 000, and in 2004 – 1 000 000.

6.2 E-Government

In February 2006, new legislation was adopted listing the general requirements for government websites and detailing minimum information requirements, for example regarding the structure of the body in question, prices for government services, details of bureaucratic procedures, offline contact information and the biography of the head of the relevant government department. A survey[38] was conducted in 2005 based on three criteria: e-information, e-involvement and e-services. For the purposes of the survey, the criteria were analysed to assess the current situation and possibilities for improvement.

E-information criteria indicate the degree of information about Government institutions provided by Government websites. This includes three subcategories:

- Direct links to peers, higher and subordinate bodies, subdivisions, the private sector, NGOs and the political community;
- Information about Government bodies (about subordinate agencies, procedures, rules and regulations, information about names of officials and their responsibilities); and
- Frequency of updates.

E-involvement criteria indicate the degree of connection between the citizen and Government through online discussion forums, surveys or polls, chat rooms, possibilities to apply for services, rules and information for applications, and forms for public comments or complaints. The study indicated that names of contact persons, their telephone numbers and addresses and/or their e-mail or online mailboxes should be included on Government websites in order to increase the connection between Government and citizens.

[38] "Belarusian government agencies online (a survey of websites)", Mikhail Dorosovich and Marina Sokolova, 03 May 2005

E-services functions are primarily non-interactive services, which include information or advice that is published online and that is designed to help citizens or businesses efficiently carry out their daily activities. The user only has to click on a link to receive the information or advice. Possible links are FAQs, administrative publications, news relating to areas under the department's charge, and consultative information.

There are also some interactive e-services, which do facilitate interaction between the website and the user and require more than a simple click to obtain information. There are four key interactive functions:

- e-filing (online release of information about commodities, civil status information, etc);
- searchable databases for consultative information, for instance, users can search information or documents by common subjects;
- possibility to apply by e-mail in order to place information on a governmental institution website; and
- submitting documents online.

Only 74 (8.2 percent) of the 903 national, regional and district Government bodies reviewed were represented online. Of these, 73.2 percent were national Government institutions (41 out of 56), 11 percent were regional (8 out of 72) and 3 percent were district (25 out of 775) bodies. District and regional councils and judicial bodies generally do not have Internet sites, the only exception being the Gomel District Military Prosecutor's Office. As for Belarusian higher judicial bodies, only two of them, the Constitutional Court and the Supreme Economic Court, are represented online.

The survey shows that regional administrations' websites provide information on NGOs, private companies and vertical Government structures. District agencies give information on businesses, NGOs and horizontal links. National institutions provide links to their subdivisions and to the private sector. The political community is only represented at e-Government sites on the national and district levels.

22 percent of Government websites are not updated regularly. The majority of Governmental agencies' websites give thematically organised content that duplicates offline information. 45 percent give only minimal information making it possible to contact Government officials via telephone or postal communications. 34 percent of websites make Governmental bodies more accessible with the possibility of online communications, and/or forms for complaints. 4 percent provide some interactive online services.

The significant improvement of Government agency accessibility as compared with the 2004 survey data can be explained by two major factors: "softer criteria" (a 3 percent increase), and a growing portion of district websites (a 34 percent increase). A smaller proportion of websites providing only minimal information (this figure stood at 56 percent in 2004 and 45 percent in 2005) indicates that more websites are giving specific information online.

Generally, the study concluded that official e-Government initiatives tend to offer one-way communication tools with limited possibilities of feedback. There are no plans to develop and financially support a large-scale e-government modernisation strategy.

6.3 E-Learning

E-learning has been discussed in Belarus, with the lack of a legislative basis for distance learning being identified as one of the factors holding back progress. For the moment, few services are available, with basic issues, such as the provision of computer equipment (58 percent of schools have computer equipment[39]) and Internet connectivity (25 percent of schools have Internet access[40]) for schools needing to be addressed before more sophisticated services can be prioritised. In 2005, Minsk regional authorities invested 103,000 Euro in the development of school computer networks, primarily for the purchase of software.

The Belarusian NREN is connected to the GEANT system.

6.4 E-Health

As a result of the needs created by the Chernobyl disaster, Belarus has a long history of e-health. This started in 1999 with cooperation between the Gomel Specialised Health Dispensary and developed into a sophisticated system for tele-consultation and an improved pathological review system for thyroid cancer.

[39] "Only 25 percent of schools have Internet access", e-Belarus.org, Mikhail Doroshevich, 16 June 2005

[40] Ibid

7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY

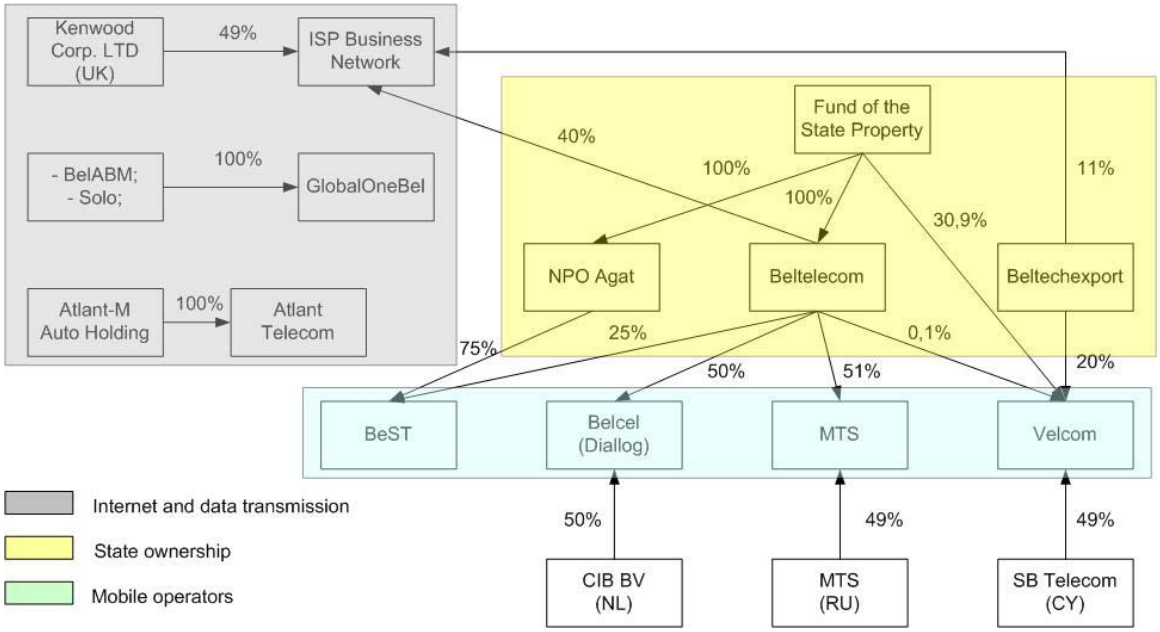
There is a very strong overlap between public and private ownership in the communications sector in Belarus, which is explained in detail in the graph below.

RSA Beltelecom[41] is a key player in the Belarusian communications market. The company holds the monopoly in a wide variety of communications services.

In 2004, according to a Ministry of Communications Decision, all state communications enterprises in the country became Beltelecom subdivisions. Private individuals in Belarus hold no shares in mobile or fixed telephony services.

Wholly owned foreign telecoms operators of fixed, mobile and cable operators are absent in the national market.

Belarus Communications Ownership Structure (adapted from Comnews)[42]



7.1 Fixed Networks

The fixed network monopolist, Beltelecom is wholly owned by the government. Liberalisation of the sector is planned for 2007, although there have been few moves to suggest that this will be achieved in a comprehensive manner. The initial view of the Belarus Government was that only Belarusian investors would be allowed to invest during the privatisation process. However, the Government appears now to have changed its stance and fully foreign-owned companies will be able to participate in the Belarusian market.

[41] http://eng.beltelecom.by/

[42] The original version of the diagram (in Russian) is available at http://www.comnews.ru/index.cfm?id=14067

7.2 Mobile Networks

The Belarusian state holds major stakes in all mobile operators. Beltelecom has shares in four mobile communications operators: MTS, Velcom, Belcel and BeST. Private individuals in Belarus hold no shares in mobile or fixed telephony services.

The Government dominates the mobile communications market. In 2003, the Belarusian Ministry of Communications put forward a proposal to further increase the Government's share of the market; however, at a press conference in October 2004, the Belarusian President renounced this initiative. In 2004, the Belarus Council of Ministers issued a decree, which expropriated just under a third of mobile operator Velcom's shares. Decree 566 State Ownership of Belarusian-Cypriot Joint Venture Mobile Digital Service (Velcom) Share of Capital, entitled the Government to acquire 30.9 percent of the company without compensation. Prior to the decree, Cypriot company SB Telecom, Beltechexport (an arms company which also has minority shares in a variety of telecommunications companies) and Beltelecom had 69.9 percent, 30 percent and 0.1 percent of the shares respectively. Following the expropriation, SB Telecom's holding in Velcom was reduced to 49 percent, Beltechexport's reduced to 20 percent, and Beltelecom's share remained at 0.1 percent.

MTS is 49 percent owned by the Russian operator MTS.[43] The state has owned 51 percent of MTS shares from the day the company was established. However, the Government has not made any investment in favour of the operator's development. The Russian partner, Russian MTS, after investing 165 million Euro has not succeeded in gaining a controlling stake in the company.

Ivan Rak, the Belarusian Deputy Minister of Communications and Informatisation, announced in March 2005 that Beltelecom had increased its BelCel shares from 33 percent to 50 percent. Now Comstruct International (the Netherlands) and Beltelecom each have a 50 percent share in BelCel.

In November 2004, BeST, a state owned mobile operator was created. Beltelecom and the national research association, AGAT,[44] were awarded 75 percent and 25 percent of the shares respectively.

International investors have a less than 50 percent share of the mobile market.

7.3 Cable Networks

At present, there are 97 cable operators in Belarus. A cable operators association, BETA[45] has also been founded, although it is not very active on regulatory issues. One

[43] See http://www.company.mtsgsm.com/ir/2005-11-23/

[44] http://www.agat.by/index.php?lng=eng&PHPSESSID=688835f862be2d6d30b168367811ab3c

of the major Belarusian cable television and Internet service providers, Cosmos TV, is in the process of expanding its cable network and provides cable television services to 40,000 additional households in Minsk. The Cosmos TV network currently covers about 150,000 households in Belarus.

British company International Telcell SNG, a co-founder of the major Belarusian cable operator Cosmos TV (50% share) was bought by Russian company "Renova Media Enterprises". The other 50% belong to the state-owned Republic Radio and TV Broadcasting Centre.

7.4 Internet Access Networks

According to the Belarusian Minister of Communications, Vladimir Goncharenko, the Ministry has issued 55 licences for providing data transmission services (including Internet access). All Internet providers are private companies, with the exception of Delovaya Set, a business network, which is 51 percent owned by state companies Beltelecom and Beltechexport (an arms company which also has minority shares in a variety of telecommunications companies). Currently, there are 30 non-state-owned Internet providers operating in Belarus. Practically all of them operate in Minsk.

According to ISPs' assessments, the dial-up services market totalled 24 million USD 19.8 million Euro) in 2004, which was 17 million USD (14 million Euro) more than in 2003.

The Ministry of Communications and Informatisation has imposed severe restrictions on access to the market for providing wireless Internet access (including mobile 3G networks). At the same time, state authorities are actively cooperating with Siemens and Ericsson in order to become providers of WiMAX services.

7.5 Satellite Operators

IP downlink and IP telephony connections are available only via VSAT (a division of Beltelecom). However, the service is extremely expensive (and only the USA Embassy uses this service).

According to Belarusian regulations, only state monopoly RSA Beltelecom is allowed to use an uplink.

[45] http://www.beta.by/cgi-bin/index.pl?cf=news

7.6 Production of IT Services

In 2003, there were around 600 organisations operating in fields such as hardware manufacturing, assembly and sales, software development and delivery, and telecommunications and Internet services. Less than 500 of these, representing about 25-28 percent of the market, are listed on the Computer News On-line site, which is one of the oldest and most frequently visited Belarusian Internet sites by ICT experts.[46] The Computer News On-line site included 494 registered organisations at the end of 2002.

Their geographical breakdown of companies listed on the website is as follows:

Minsk - 373;
Brest and adjacent areas - 28;
Vitebsk and adjacent areas - 25;
Gomel and adjacent areas - 23;
Grodno and adjacent areas - 24;
Moguilev and adjacent areas - 13 and
Minsk adjacent areas - 8.

Functional breakdown:

PC and telecommunication hardware manufacturing, assembly and delivery, service support and maintenance - 250;
Software developers - 70;
Internet providers - 56 and
ICT application consultancy companies - 60.

These are, as a rule, private organisations or companies; therefore there must be at least 600 companies operating on the ICT market of the Republic of Belarus, if state institutions and R&D Institutes of the Ministries of Industries, Communications, Education, the National Academy of Sciences of Belarus and other companies are taken into account.

7.7 Financial Development of the ICT Sector

In 2004, revenue from the telecommunications market totalled 700 million US$ (579 million Euro), 39 percent for mobile communications and 61 percent for fixed telephony, Internet access and data transmission. The fixed communications segment grew by 40 percent and the mobile communications market doubled in 2004.[47] The aggregate profit of telecommunications companies totalled 480 billion BYR (184 million Euro), with 95.9 billion BYR (36.8 million Euro) in net profit for the first seven months of 2004, which is 3.5 times more than that of the same period in 2003.[48] No more recent figures have been published by the ministry.

[46] http://www.kv.by/sprav/sprav.cgi

[47] According to figures published by Comnews - http://www.comnews.ru/index.cfm?id=14067 .

[48] Belarusian Ministry of Statistics and Analysis.

.
According to Market-Visio Consulting/Gartner evaluations, the volume of exports of Belarusian IT companies will increase by 54 percent in 2006 as compared with 2005 and will total 200 million US$ (165 million Euro). In 2005 volume of exports of Belarusian IT companies grew by 44 percent as compared with 2004, and totalled 130 million US$ (107 million Euro). In 2007, the volume of exports of Belarusian IT companies will total 250 million US$ (206 million Euro). The same research indicates that there is consolidation in the market, more competition and an overall increase in service quality.

Production and services profitability increased from 10 percent to 19.5 percent in 2004 and sales profitability increased from 7.4 percent to 13.1 percent. Some 81,000 computers were sold in Belarus in 2003, bringing sales up to 50 million US$ (41.35 million Euro), according to the latest IDC[49] review of the Belarusian computer market. Most of the country's computers are assembled by Belarusian companies, with the share of major international computer producers not exceeding 10 percent in 2003.

Over the last two years there have not been any significant mergers or acquisitions. The latest acquisition was undertaken when Sonex Group,[50] one of Lithuania's biggest IT companies, acquired one of the largest Belarusian computer companies, Xorex-Service.[51] Sonex will produce computers and servers for the Belarusian and Russian markets and will provide information services.

According to a survey conducted by Extmedia,[52] web-hosting sales volumes totalled 500,000 US$ (413,200 Euro) in 2004, which was 40 percent more than in 2003. It was expected that, by the end of 2005, web-hosting sales volumes would increase to 1 million US$ (826,400 Euro).

The software export market’s revenues totalled 65 million US$ in 2003 (54 million Euro), and 90 million US$ (74.4 million Euro) in 2004. This figure will likely double during the next two years, with annual growth totalling from 40 percent to 60 percent. It is estimated that in 2006 market revenue will total 200 million US$ (165 million Euro).

According to ISPs’ assessments, revenue for the dial-up services market totalled 24 million US$ (19.83 million Euro) in 2004, which was 17 million US$ (14.04 million Euro) more than in 2003.

[49] See http://www.idc-cema.com

[50] http://technologies.sonex.lt/sonex/en/

[51] http://www.xorex.by/page//30/

[52] Unpublished information that was received via e-mail from Extmedia, which is a web-hosting company.

Political Intelligence

INTERNEWS

Georgia

Local Experts: Volodymyr Hardabkhadze / Levan Kvernadze

Table of Contents

1 OVERVIEW 4
1.1 Regulation of Electronic Communications 4
1.2 Regulation of Electronic Services 5
1.3 Use of Information and Communications Technologies 5
2 GENERAL ENVIRONMENT 6
2.1 Influence of Stakeholders on Regulation and Policy....6
2.2 National Development Plan 6
2.3 Data Protection 6
2.4 Cybercrime and Spam 7
3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 8
3.1 Interconnection 8
3.2 Numbering 9
3.3 Rights of Way and Facilities Sharing/Collocation 10
3.4 Tariff Policy 11
3.5 Cost Accounting....11
3.6 Universal Service 11
3.7 Local Loop Unbundling 12
3.8 Leased Lines....13
3.9 Mobile Services....13
3.10 Satellite Services 14
3.11 Status of the National Regulatory Authority (NRA) 15
3.12 Licensing and Authorisation....16
3.13 Spectrum....17
4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 19
4.1 Digital Signatures....19
4.2 Payment Systems 19
5 USE OF ELECTRONIC COMMUNICATIONS SERVICES....21
5.1 Fixed Telephony 21
5.2 Mobile Usage 21
5.3 Cable Services....22
5.4 Computer Availability 22
5.5 Internet Access 22
5.6 Public Internet Access Points (PIAP)....23

5.7 Wireless Access Services....24
6 AVAILABILITY OF ONLINE SERVICES....25
6.1 E-Commerce....25
6.2 E-Government....25
6.3 E-Health....26
6.4 E-Learning....27
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY....29
7.1 Fixed Networks....29
7.2 Mobile Networks....30
7.3 Cable Networks....30
7.4 Internet Access Networks....30
7.5 Production of IT Services....31
7.6 Financial Development of the ICT Sector....31

1 OVERVIEW

The current independent state of Georgia was established in 1991. It has a population of 4.5 million people and a land mass of 69,700 square kilometres. The GNI per capita was 1,115 Euro (1,350 US$) in 2005, based on World Bank figures. Georgia is a republic and is divided for administrative purposes into 9 regions, 2 autonomous republics and one city, Tbilisi.

1.1 Regulation of Electronic Communications

Georgian interconnection agreements are based on commercial negotiation, with the National Regulatory Authority (Georgian National Communications Commission - GNCC) intervening when decisions cannot be reached in this way. The NRA is governed by very strict rules with regard to transparency, independence, consultation and conflict of interest avoidance. No significant concerns have been identified with regard to its effectiveness.

The GNCC has responsibility for numbering, but has inherited a very complex system which leads to significant competition concerns and does not correspond in several ways to international conventions on numbering management. Policy development from the government side comes from the Telecommunication and Information Technology Department of the Ministry of Economic Development. While there is little to criticise regarding national regulation in the communications sector, the Ministry does not have a published forward-looking strategy for development across industry, resulting in major gaps, particularly in fields, such as e-commerce, where it does not share responsibilities with the GNCC.

There are comprehensive rules with regard to facilities sharing, collocation and unbundling. The implementation of these is overseen by the GNCC and, thus far, few significant concerns have been raised. Unbundling, in particular, is very successful in Georgia.

A considerable degree of rebalancing has been undertaken, although there is still some work to be done. Cost accounting measures have been implemented through legislation, with an intermediary solution currently in place and LRAIC being planned in the medium term.

There are currently no universal service obligations placed on the incumbents, although this may change in the near future. As in Ukraine and Moldova, pilot projects are being launched in order to create a basic level of shared access to communications services for rural communities.

There are neither sector specific regulations nor general obligations with regard to leased lines in Georgia. General competition rules are used to regulate this sector.

Work has begun on data protection legislation, although little progress has been made recently.

1.2 Regulation of Electronic Services

In contrast to the very well developed and implemented telecommunications regulatory framework in Georgia, the e-commerce regulatory framework has been somewhat neglected. The now defunct State Department for Informatisation produced several comprehensive drafts of an e-commerce law from 2000 to 2003. However, this document was shelved for two years and work has only recently been restarted. Progress is extremely slow as a result of overlapping ministerial responsibilities and the absence of any overarching strategy or political will to move forward to definitively adopt comprehensive e-commerce legislation.

Georgia has comprehensive laws with regard to intellectual property protection. On the other hand, the legal framework for online child abuse images is unclear, particularly with regard to the position of Internet access and hosting providers. The legal position of Internet access and hosting providers with regard to illegal content more generally has never been directly clarified, although the 2005 Law of Georgia on the Freedom of Speech and Expression adopts an approach very similar to that of the EU – although it only covers liability for defamation, rather than the horizontal approach taken in the EU.

In the absence of a clear regulatory framework for commercial online services, the potential for development of the market has been limited. Banks have been at the forefront of the development of online commercial services, such as online payments for utilities and basic banking facilities.

1.3 Use of Information and Communications Technologies

Georgia suffers from both a low teledensity and a severe urban-rural divide. Despite high levels of competition and effective and well-implemented legislation in Georgia, both fixed (14.7 percent[1]) and mobile (28 percent[2]) penetration are in line with the other countries in this study, indicating the level of infrastructure problems in Georgia and the difficulties of rolling out services in a country with a very low average income.

With an average household income of 247 GEL (133.77Euro[3]) per month in 2006, a 420 Euro computer equates to approximately three month's net income for a family. Despite low Internet access prices, the most recent available figures suggest that Internet penetration is only 3.9 percent.[4]

There has been very little progress in Georgia regarding the provision of e-government services.

[1] JSC United Telecom of Georgia Presentation - http://www.privatization.ge/spp/spp_files/entity_pdfs/ent_16_en.pdf

[2] Data from TeliaSonera. Q2 2005 Report

[3] Data from the National Statistics Agency - http://www.statistics.ge/_files/georgian/Quarterly%20Bulletin%20II%202006.pdf

[4] ITU statistics quoted in Internetworldstats.com

2 GENERAL ENVIRONMENT

2.1 Influence of Stakeholders on Regulation and Policy

The telecommunications sector in Georgia is well organised in terms of trade associations, with the Telecommunication League, Broadcasters Association[5], Cable TV Association[6] and Internet Association all defending the interests of their respective sectors. These associations are involved in the consultation processes of the National Regulatory Authority (GNCC) and believe that they are effective interlocutors on behalf of their particular part of the industry.

However, the GNCC itself is relatively new, as are the associations that have been established in response to it. Therefore, they have yet to develop beyond the basic function of communicating with the regulator. That said, they should act as a useful counterbalance should either GNCC or relevant ministries adopt policies perceived not to be in the best interests of the industry.

2.2 National Development Plan

No national development plan for the ICT sector has been implemented in Georgia. However, the Ministry for Economic Development has been working on a plan for the past two years, covering issues such as electronic governance for society in general as well as in the specific areas of education, culture and health. Work on the plan is ongoing and dates for publication and implementation have yet to be set.

2.3 Data Protection

Georgia signed the Council of Europe Convention on the Protection of Individuals with regard to Automatic Processing of Personal Data in 2001, but has not yet ratified it. To prepare for the future ratification of the Council of Europe Convention, the Georgian civil service has commenced work on the development of draft legislation, which will encompass many of the key elements of EU data protection principles. However, not much progress is being made in developing the draft and passing it into law, and there is little indication that this situation will change in the near future. Data protection does not yet appear to be a priority for the Georgian authorities.

[5] http://www.gnab.ge/

[6] http://www.itic.org.ge/cabletv/about_us.htm

2.4 Cybercrime and Spam

Georgia has not signed, acceded to or ratified either the Council of Europe Cybercrime Convention or the Optional Protocol of the Convention on the Rights of the Child on the on the Sale of Children, Child Prostitution and Child Pornography.

According to Interpol, in addition to the age of consent being considerably lower than most countries (14 years) there are no laws specific to child pornography.[7]

However, the Constitution prohibits the "*propagation*" of "*pornography and immorality*". That said, both terms are difficult to define precisely and therefore a considerable amount of case law will be needed before the legal situation becomes clear in Georgia (for example, does providing access to foreign websites constitute "propagation"? Does providing access to specific websites that an ISP has been informed may host illegal material constitute "propagation"?).

Georgia is a member of the World Intellectual Property Organisation (WIPO) and has undertaken a considerable effort in aligning its legal system with regard to IPR international norms. Georgia has extensive intellectual property laws covering databases and rules concerning the decompilation of software.

There is no legislation regarding the sending of unsolicited electronic communications in Georgia.

[7] Information from "Legislation of Interpol Member States on Sexual Offences against Children," found on the Interpol Website http://www.interpol.int/Public/Children/SexualAbuse/NationalLaws/csaGeorgia.asp, (last accessed 13 August 2005.)

3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS

UTG[8] (United Telecom Georgia, the Georgian incumbent local fixed line operator) was designated by the GNCC as having SMP in fixed termination, local loop, underground infrastructure, local calls and call origination.

3.1 Interconnection

There is a vibrant fixed market with an incumbent (now privatised) long-distance carrier (Sakartvelos Telekomi/Telecom Georgia[9]), and an incumbent local lines (sold in May to Route d'Esch Property BV, formerly Black Sea Telecom Holding BV, a Kazakh company) operator (Sakartvelos Elektrokavshiri/UTG).[10]

Retail prices are not regulated in Georgia. Interconnection pricing is subject to commercial negotiation and the National Regulatory Authority (GNCC) only intervenes when decisions cannot be reached in this way. Fixed-to-fixed and mobile-to-fixed termination costs 0.027GEL (0.012 Euro), while fixed-to-mobile and mobile-to-mobile termination costs 0.155GEL[11] (0.071 Euro). The fixed-to-mobile rate was reduced by 14.5 percent in July 2005 and again in 2006, as a result of lobbying by the fixed telephony industry. Telecom Georgia (local lines incumbent) has indicated that it thinks the wholesale call origination market is fully competitive and does not need regulation.

The Georgian Law on Electronic Communications 2005[12] (articles 41 and 42) establishes the procedures for dealing with interconnection disputes. This is given more precise procedures by GNCC Decree 6 on the Approval of the Charter on Interconnection. The dispute resolution process has strict time limits to minimise the disruption caused.

The GNCC also has a monitoring department, which requires operators to provide details of incoming and outgoing traffic, both domestic and international, to ensure that it has all the necessary data to regulate the sector effectively.

Each operator is required to publish standard conditions and tariffs for interconnection and to provide interconnection to other operators, directly or indirectly, at any technically feasible point. Further key obligations include:

- Reasonable tariffs for interconnection;
- Publication of the minimum terms and conditions for interconnection agreements;
- Implementation of interconnection within 3 months from the date of submission of an application to the interconnection provider;

[8] http://www.utg.ge/

[9] http://www.telecom.ge/

[10] http://www.utg.ge/

[11] All data from industry sources

[12] An English translation of the law can be found here: http://www.gncc.ge/files/7050_3555_376651_eleqtr.eng.pdf

- Requirement for collocation and facilities sharing.[13]

Rather than requiring the publication of a Reference Interconnect Offer (RIO), the GNCC regulates key aspects of interconnection pricing for the whole market, such as line rental for unbundled lines (2.5GEL or 1.15 Euro) and for ducts. Duct prices have increased significantly, with a new pricing structure based on different thicknesses of cable. One kilometre now costs 55.66 Euro per month for cables of 15mm or smaller, 120 Euro for cables of 15mm to 25mm, and 180 Euro for larger cables.

Details of pricing, including at least two weeks advance notice of retail price changes, must be communicated by operators to the GNCC.

Carrier selection is available (see the section on Numbering, below), although there are concerns regarding the management of numbering for this purpose. Carrier preselection is not available. In addition, a limited form of carrier selection is available in the mobile sector, whereby users can opt to have their calls carried by a provider other than their mobile provider – although choice is restricted to the operator(s) that are in partnership with the mobile provider in question. Some corporate networks run by competitive operators do not support selection codes.

Fixed telephony and dial-up Internet can be paid for via prepaid cards, post-paid billing or revenue sharing.

The concerns of incumbent operators in other countries in this study regarding the illegal termination of VoIP calls do not exist in Georgia, as there is no difference in termination charges for local and international calls and therefore no profit to be made. However, there are problems with severely outdated equipment making traffic management very difficult and some traffic being terminated illegally (without the requisite payment) by some operators. Testing in Tblisi and Kutaisi, carried out with the assistance of the Ukrainian incumbent, Ukrtelecom, led to a variety of anomalies being identified. Initial estimates by UTG are that this results in a 10-15 percent loss of interconnection revenues.

There are currently two GSM operators, Geocell[14] and Magticom,[15] and one CDMA operator, Telenet[16], active in the market.

3.2 Numbering

Numbering in Georgia has developed into a particularly complex issue for a variety of reasons. Firstly, the 1999 Law on Post and Telecommunications (LPT), which established the GNCC, divides responsibility for this policy area between the Ministry of Transport and Communications (the “MTP”) and the GNCC. Article 8 of the LPT gives the MTP responsibility for defining and approving policy for a unified numbering system

[13] "Georgia: Structural Reforms Support Project Regulatory Development" GNCC, DETECON-WB-GNCC August 2003

[14] http://www.geocell.ge/

[15] http://www.magtigsm.com/

[16] http://www.telenet.ge/

with the participation of the GNCC and other interested parties; while article 20.5.l of the same law gives the GNCC responsibility for the "*conditions and rules of assignment of numbering resources and [allocating] numbering resources*." Within that framework, the GNCC implements the rules laid down in the 2005 Law on Electronic Communications[17] (Article 48).

The situation is equally complex with regard to the availability of non-geographic numbers, such as those which could be used for VoIP services or carrier selection. Currently, the digits used in the numbering plan neither identify the type of service nor the tariff that is applicable for calls to the number. In addition, very few numbers have been allocated in the current numbering plan to non-geographic services, and the numbering plan used for such services is not capable of providing additional numbers without being fundamentally reformed.

Similarly, there is a limited number of short codes available in Georgia and these are not equally available to all providers, including providers of carrier selection services. Major issues regarding the sustainability and impact on competition of the way in which short codes (which are also used for fixed services in Georgia, unlike most other countries) are organised need to be addressed.

Fixed numbers can be ported in areas with digital networks and within tariff boundaries. There is no regulation covering costs for portability and, due to low usage, this policy area has not attracted the attention of the GNCC. Mobile portability is planned but not yet in operation.

There is neither sufficient numbering space available for commonly recognised national services nor is the principle of non-discriminatory access to non-geographic service numbers met by the current numbering plan. Furthermore, the Georgian numbering plan does not correspond on a number of points to ITU recommendations.

3.3 Rights of Way and Facilities Sharing/Collocation

Georgian legislation contains advanced collocation and facilities sharing obligations. All communications service providers are required to provide collocation terms that are fair, reasonable and non-discriminatory. Rights of access to infrastructure such as ducts, and network elements, as well as unbundled lines, are ensured by the GNCC.

With regard to collocation in telephone exchange buildings, there are no requirements for the building of separate rooms for new entrant equipment, structural surveys, or negotiations on participation in costs for air conditioning, electricity and security.

The GNCC is responsible for overseeing complaints. The regulator has indicated that problems concerning refusal of collocation are rare, possibly due to the fact that there is a commercial benefit for the local lines incumbent to facilitate collocation as part of its business.

[17] http://www.gncc.ge/index.php?lang_id=ENG&sec_id=7050&info_id=3555

3.4 Tariff Policy

The rebalancing of tariffs in Georgia has mostly been accomplished, although some issues remain outstanding. In particular, the roll-out of billing for local calls needs to be completed and needs to be balanced by measures to improve universal service.

A price ceiling and floor was applied to international tariffs in order to bring them more into line with costs in 2001. This was repealed in 2005, as the GNCC considered that the market had become sufficiently competitive.[18] Similarly, price caps were placed on network interconnection in 2005[19]. This resolution also established rules for establishing the prices for a call termination on mobile to fixed and fixed to mobile calls. The regulator has informed the study team that the aim for 2006 was to move closer to the EU approach to cost accounting in order to ensure more cost orientation of tariffs and to improve the competitive environment.

3.5 Cost Accounting

The GNCC has produced a cost model that has been ratified through legislation. It has only been verified internally and is not yet in line with EU cost models. The "full allocated cost" model is an interim step on the way to a Total Service Long Run Average Incremental Cost model (LRAIC). Full details regarding the accounting system have been published by the GNCC.

However, the concept of "significant market power" was introduced into Georgian communications legislation by the 2005 Law on Communications. The GNCC designates companies as having SMP if "t*he authorised undertaking has no competitors, is protected from significant competition or that the authorised undertaking's competitive market position enables it to unilaterally make a significant influence restricting competition in this segment of the market*. (Article 2.ddd).

.

3.6 Universal Service

Despite having a very comprehensive communications regulatory framework, the country has the similar legacy problems as the other countries in this study with regard to outdated infrastructure, low fixed telephony penetration and so on.

In September 2005, the GNCC established rules regarding the provision of universal service in Georgia, taking into account the EU Universal Service Directive (2002/22/EC). The GNCC aims to propose more detailed plans regarding practical implementation of the rules on universal service in due course, but is first dealing with the issue through

[18] GNCC Resolution 2005/03/11

[19] GNCC Resolution 2005/06/06

rolling out pilot projects. The company that will provide the services will be selected through a competitive bidding process, which will be undertaken on a national level.

The GNCC is also considering imposing a universal service obligation on the former incumbent local lines operator (UTG) and it will be up to that operator, at the end of the financial year, to demonstrate the financial burden that this has created for it. On this basis, the GNCC will pay the operator an amount equal to the net cost from the universal service fund. Although a universal service fund has already been created, some work still needs to be done in order to finalise the methodology for calculating the net costs of service provision. 80% of licence fees from communications providers goes towards financing the universal service fund.

3.7 Local Loop Unbundling

The Georgian Law on Electronic Communications (2005) establishes the legal basis for LLU, covering shared access both at the loop and sub-loop levels. A significant portion of the data regarding the layout and quality of the network is available through the GNCC, which has effectively eliminated the problem of having to rely on the incumbent to provide the data.

There is a significant difference between the wholesale (2.3GL) and retail (4GL) cost of the lines, thereby avoiding the price squeeze experienced or alleged in some EU countries.

Problems reported by competitive operators focus on the availability of ducts. Collocation arrangements in Georgia are very favourable for new entrants as there are no requirements for the building of separate rooms for new entrant equipment, structural surveys, nor negotiations on participation in costs for air conditioning, electricity and security.

The regulator reports that there is no need for verification of claims regarding lack of space in exchanges because the local incumbent (state telecoms provision has traditionally been divided between a local lines provider and a long-distance service provider) is treating unbundled access as a commercial activity in its own right and consequently is facilitating it in an open and transparent way. As a result, there are neither reports of nor evidence that unfounded claims regarding lack of space are being made.

Access is available at ATM, POP and DSLAM levels and, in some places, alternative backhaul providers can be used by competitive providers.

The unbundling rate is 17 percent, with competitive operators accounting for 30 percent of lines currently in operation. While this rate for local loop unbundling is exceptionally high, it does have very shaky foundations, as there are no specific rules regarding LLU in Georgia. This means that the local incumbent has considerable potential, should it ever wish to do so, to disrupt the provisioning of unbundled lines.

3.8 Leased Lines

There is no sector-specific regulation in Georgia with regard to the provision of leased lines. There is no obligation to have at least one operator providing leased line services at every point in the country. Where there is no capacity available but ducts are in place, competitive operators can use the existing ducts to lay their lines.

However, generally speaking, leased lines are dealt with in the same competitive framework as other network elements, so it would be incorrect to say that the sector is not regulated at all. The Law on Electronic Communications creates obligations with regard to transparency and to the cost accounting mechanism used. Similarly, regulatory obligations are in place to cover non-discrimination and cost orientation for the SMP operator. There is also an obligation to have a maximum five-day period for provisioning and repair.

Prices are charged at a flat rate and do not take distance into account. Examples of prices in Georgia are 64k for 50 GEL/month (23 Euro), 2mbps for 620 GEL/month (285 Euro), 34mbps for 9,300 GEL/month (4,279 Euro).

Statistics are collected by GNCC with regard to service availability (although these are considered commercially sensitive and therefore not released to the public) in order to monitor the market. No technical limitations are allowed on the interconnection of leased lines and public telecommunications networks. However, limitations can be imposed due to lack of facilities.

The market is currently satisfied with the available offerings at the slower end of the leased line market (64kbps and 2mbps), meaning that there is not yet any impetus for regulatory action to improve either availability or price for faster lines. However, the NRA does believe that the cost of leased lines is too high and measures are therefore planned within the next year to bring them down.

3.9 Mobile Services

The Georgian mobile market consists of three GSM (two active) and CDMA operator and accounts for 60 percent of income in the telecommunications market according to GNCC estimates. The three players currently on the mobile market are GSM operators Magticom[20] and Geocell,[21] and Iberiatel (CDMA).[22] Virgin Islands-based company Bloomfin won an auction for a GSM licence in February 2006, paying 71.9 million GEL (33.12 million Euro). Telenet is also planning a CDMA-450 network covering the whole territory of Georgia in order to provide broadband and voice services.

With regard to 3G licences, one 800Mhz (3x) band was auctioned in June 2005. The auction attracted three bidders and was won by Magticom. During the course of the

[20] http://www.magtigsm.com/

[21] http://www.geocell.ge/v2/eng/index.php

[22] http://www.iberiatel.ge/

auction, the bid went up from an initial 5 million GEL (2,305,426 Euro) to a final price of 26 million GEL (11,992,366 Euro).

A second 3G licence was auctioned in February, 2006. The initial price was set at 8,491,392 GEL (3,911,371 Euro) and was won by new entrant Argotex Ltd for 19,954,782 GEL (9,191,728 Euro). Argotex subsequently sold the licence to Magticom, having never launched services and having paid one third of the licence fee. A third licence was auctioned in May, 2006. With an initial starting price of 8.5 million GEL (3.9 million Euro), the auction was eventually won by Telecom Invest Georgia with a bid of 18.68 million GEL (8.6 million Euro).

According to figures from the 2005 GNCC Annual Report and Statistics Georgia, the mobile penetration rate is 27%. Income increased between 2004 and 2005 by 70 million GEL or 32.24 million Euro.

There are no statistics available regarding the number of SMS messages sent in the Georgian market. There are also no statistics available regarding the use of GPRS services.

As an example of prices in Georgia, Magticom's prepaid Mono service has no activation fee (although the SIM card must be purchased for 5 GEL (2.31 Euro)) and no monthly subscription is charged. An SMS costs 0.06 GEL (0.027 Euro) compared with a peak call charge of 0.864 GEL/minute (0.398 Euro).[23] GPRS activation costs 5 GEL (2.31 Euro), with each megabyte of downloaded data costing 1 GEL (0.462 Euro).

Monthly fixed line rental is 4 GEL (1.84 Euro) for private customers and 6 GEL (2.76 Euro) for businesses.

3.10 Satellite Services

Satellite services (offering IP uplink and downlink, telephony and television services) are available both to consumers and businesses in Georgia, although the costs of such services are generally too high for private consumers.

Satellite services are also made available on a wholesale basis for ISPs to resell. The GNCC reports that it is standard practice for large communications operators to have a spare satellite channel. ISPs use satellite DVB technology to receive IP connectivity.

On an international level, Georgia is a member of both UTELSAT and EUTELSAT.

Direcway offers a 500kbps download speed for a connection fee of 600 US$ (500 Euro) and a monthly fee of 60 US$ (50 Euro).

In some rural areas, satellite is the only option for receiving TV signals.

[23] For calls within the same network – no figures are quoted on the Magticom website for fees for calling other networks.

3.11 Status of the National Regulatory Authority (NRA)

The Law on Post and Telecommunications, which was passed in 1999, established the country's national regulatory authority, the Georgian National Communications Commission (GNCC). It is fully independent from the relevant ministries of Government. The Commission consists of three Commissioners, who are nominated by the President. Only the Commissioners can select, appoint or dismiss staff of the organisation.

The GNCC's funding comes directly from industry (up to 2004, the GNCC received 20% of licence fees, which was its primary source of income, which serves to ensure that it both has the necessary resources to fully carry out the tasks apportioned to it and also to increase its independence from the Government. Its income has increased strongly since its creation, rising from 2.2 million GEL (1.01 million Euro) in 2001 to 5.5 million (2.5 million Euro) in 2004. Starting from the third quarter of 2005, its main source of financing is a 1% fee on total income excluding VAT of all communications companies and broadcasters. This resulted in a net income of 54% more than budgeted for in 2005 - 9.9 million GEL instead of 6.4 million GEL.[24]

The key functions of the GNCC are as follows:

- To determine the licensing conditions in the telecommunications and postal sphere and grant, modify, renew, suspend and revoke licences according to the rules determined by the law;
- To determine tariffs and their regulation for the services provided by Georgian telecommunications and postal networks;
- To certify (type-approve), standardise and provide metrological services for telecommunications and post facilities;
- To regulate the technical and economic conditions of telecommunications network interconnection;
- To define radio frequency spectrum and allocate spectrum in cooperation with the Ministry and other interested authorities;
- To promote a competitive environment;
- To settle disagreements between licence holders and between licence holders and consumers within the scope of the Commission's competence;
- To supervise the implementation of licensing conditions and, in the case of violation, take measures envisaged by the law;
- To provide open and transparent public relations;
- To ensure the development of a competitive environment by determining rules regulating the incumbents' activities;
- To supervise and control the implementation of these rules and the rules specified by the Georgian Law on the Protection of Consumer's Rights; and
- To define conditions and rules for the assignment of numbering resources and to allocate numbering resources.

The GNCC is authorised to obtain any information that it deems necessary in order to carry out its tasks.

[24] This is explained in detail in the 2005 Annual Report of the GNCC.

The GNCC has two options when dealing with infringements – fines and the revocation of licences. The GNCC can impose fines up to a maximum of 1,000 Lari (448 Euro) for natural persons or 5,000 Lari (2,244 Euro) for businesses. Licences can be revoked if the licence holder:

- Makes technological and construction changes in its technical facilities without the agreement of the Commission;
- Violates regulations, established by existing (effective) legislation in the sphere of telecommunications and post;
- Contravenes the rules determined by international agreements or breaches the rules laid out in the following Georgian laws: the Georgian Organic Law, the Georgian Electoral Code, existing Georgian laws on Copyright and Related Rights, Protection of Minors, Advertising and State Secrets, or if the licence holder violates in any other way the rights and freedom of the people, lawful interests and endangers the life and health of the people; or,
- Does not maintain a service quality that corresponds to its licence obligations.

There is a very comprehensive set of rules in place to avoid conflicts of interest. For example, no employee of the GNCC, nor any close relatives of employees of the GNCC, can directly or indirectly have any economic interest in licence holders, nor receive any income or other benefits from licence holders or hold any position in the business of a licence holder.

The consultative structure of the GNCC has brought about the need for the various parts of the communications industry to create structures to be able to give a voice to their sector. Indeed, it is interesting to note that Article 28 of the Law on Communications and Post even places an obligation on the GNCC to ensure that "*all interested parties*" are made aware of its meetings and to attend if they so wish. Even where practical considerations require the meetings to take place in secret, the law requires decisions taken to be made public.

The consultation function of the GNCC is supported by the Advisory Council of the Commission which adds an extra layer of independent expertise to the workings of the GNCC. The Council consists of well-known telecommunications and post specialists, representatives of civil society, and experts of different spheres, including various international organisations

The Commission has a deadline of between 5 and 45 (depending on the issue in question) working days to deal with disputes.

3.12 Licensing and Authorisation

In Georgia, licences are required for fixed and mobile telecoms operators, cable operators and Internet service providers. There are no restrictions on the establishment of foreign providers in the Georgian market. Licence holders are obliged to provide the GNCC with details of tariffs for their various services and of any price changes at least 14 days before they come into effect.

Licensing obligations are based on the Law on Communication and Post (1999) and the Law of Georgia on Principles for Issuing Entrepreneurial Licences and Permits (2002). The licensing regime is generally considered to be cumbersome.

There are also some fundamental problems, such as the technology specificity of the licensing requirements in the Law on Communications and Post. In particular, all the technologies requiring licensing are specifically enumerated, meaning that any new technology would not automatically be covered. General authorisations are provided for in the Law on Communications and Post, but the requirements are generally considered by industry as being too narrow to be of practical value. A wide range of documentation is required for an authorisation.

Licence fees are paid via an up-front payment as well as an annual fee. This money is then used to cover the costs of licence provision and provide funds for the NRA (20 percent) and for the provision of universal service (the remaining 80 percent). The licence fee is calculated as 1 percent of the company's gross income (cash and other income) during the preceding calendar year.

Conformity assessments for mobile phones also cause particular problems in Georgia, as the rules are considered too burdensome.

3.13 Spectrum

Article 20 of the Law on Communications and Post (1999) gives the GNCC the right to assess available spectrum and distribute it with the assistance of other "interested" (undefined) agencies, assign radio frequency, supervise compliance with conditions of licences and take action where the law has been violated.

The 2.4GHz and 5GHz bands are not subject to licensing requirements. For non-commercial users, a permit issued by the GNCC is all that is required. ISPs and data transmission companies (who already have a licence) can be given a permit for use of these bands. Auctions for the use of 2.5Ghz-2.7Ghz frequencies were held for the Batumi region.

Twelve-month Wi-Fi permits are available when the system is to be used for non-commercial purposes and for commercial purposes in certain circumstances. There are, in total, six different types of permit related to Wi-Fi use (independent of the licences needed if the entity is a telecommunications provider) and separate from the registration of the equipment itself. A nationwide auction was held for 3.5Ghz frequency for the provision of WiMAX services, which was won by the only bidder, Telenet.

Authorisation of devices using high frequencies is somewhat cumbersome. Registration by the GNCC requires:

- Safety verification by the Ministry of Labour, Health and Social Security;
- Approval by local government; and
- Approval by the Ministry of Transport and Telecommunications.

The GNCC is at a comparatively early stage of organising itself in the area of spectrum management and it is still to early for communications providers and users alike to judge the effectiveness of the framework in which it operates.

4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES

4.1 Digital Signatures

From December 2000 onwards, the State Department for Informatisation created five draft laws on e-commerce, one version of which consisted of eight chapters and forty-four articles and covered information provision, e-documents, document copies, electronic signatures, verification, ownership of e-signatures, and various other e-commerce issues. Some of these proposals were technology specific and therefore not in line with international standards. Other significant issues raised by industry were that the draft laws included requirements regarding the government licensing of digital signature providers, the impossibility of anonymous or pseudonymous transactions, and inadequate concern for consumer data privacy.

The ICT department of the Georgian Ministry of Economic Development is responsible for the issue of digital signatures. The draft legislation described above is being used as the basis for work in this policy area. Management of the process to move the dossier forward is the responsibility of the Deputy Head of the Department of Telecommunications and Information Technologies in the Ministry of Economic Development.

The current draft law on e-commerce retains its very broad scope (divided into sections on digital signatures, digital documents and electronic commerce). Progress has been slow partly due to the need to iron out some of the flaws created during the initial drafting process and to focus on harmonising the new Georgian law with the experience and approach of EU e-commerce and e-signature legislation, as well as the United Nation's model e-commerce law. It is also necessary to amend the draft in order to adapt to recent changes in Georgian law. It was expected that the legislation would be published in the first half of 2006, with a bill being presented to Parliament later in the year. However, the time of writing in December 2006, no progress had been made.

4.2 Payment Systems

In the absence of a comprehensive e-commerce regulatory framework, e-payment systems have not been in great demand. However, services are now starting to appear, despite the absence of a detailed legislative package. For instance, the TBC[25] bank has been quite active in international e-payment projects. TBC joined SWIFT[26] in 1996 and is integrated into the Visa Electron credit card system. It now provides a basic range of online services to customers including the purchase of phone cards, utility bill payments, accessing historical data, and other account status operations.

[25] http://www.tbcbank.ge/eng/

[26] http://www.swift.com/index.cfm?item_id=1008

TBC has also teamed up with Intellectbank and UFC International[27] to provide innovative e-services for their payment card customers. The services include SMS-based services which enable users to avail of their cards to pay for phone services, and to block and unblock their cards in case of theft or loss.

[27] https://secure.ufc.ge/index.php

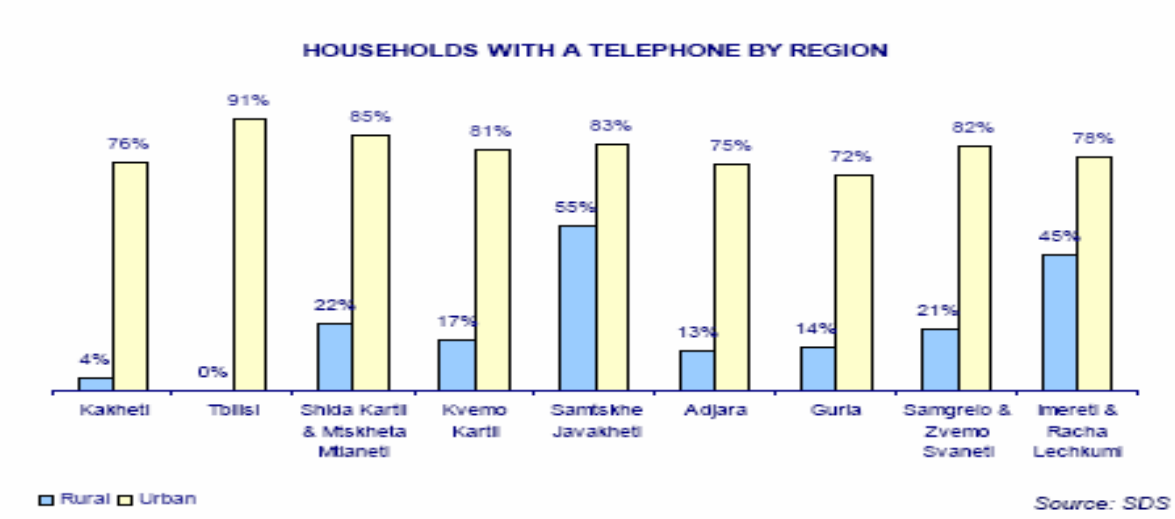
5 USE OF ELECTRONIC COMMUNICATIONS SERVICES

5.1 Fixed Telephony

Georgia's infrastructure is a major obstacle to the development of the Information Society in the country. Teledensity is very low and the network is severely outdated and unreliable. Furthermore, there is a significant discrepancy between the urban and rural areas and this urban-rural digital divide appears to show little or no signs of decreasing. Operators are investing in more modern and sophisticated services to address the markets in the major cities, but there appear to be few signs of similar initiatives being undertaken in rural areas.

Furthermore, current infrastructure is not sufficient to satisfy demand for services. According to UTG,[28] there is a waiting list, which is equivalent to 38 percent of the existing fixed line market.[29] The GNCC 2005 Report indicated that there were 550,000 fixed telephony subscribers in that year, representing a penetration rate of 12.72%, using 2005 population figures from the Statistics Georgia.

Urban-rural Divide in Fixed Telephony



5.2 Mobile Usage

Possibly due to the high level of competition in the fixed market and the resultant low prices (a one minute fixed line call costs over ten times less than a one minute mobile call), the take-up of mobile services is low when compared with other NIS. Currently, only one sixth of the population uses a mobile phone.[30] Over 94 percent of mobile phone

[28] Data from UTG, February 2006

[29] Ibid

[30] All statistics in the mobile services section come from the GNCC

users avail of prepaid tariffs. High levels of prepaid users are common in less affluent societies as they allow consumers to have more control over their expenditure. The 2005 GNCC Annual Report indicates that there were 1,175,000 active SIM cards in Georgia, representing a penetration rate of 27.2%.

5.3 Cable Services

There are approximately 40,000 households connected to cable networks, with the overall proportion of households covered by cable networks standing at approximately 11 percent. A high proportion of large businesses use cable internet, while smaller businesses tend not to use this technology. The overall business penetration rate for cable is estimated by the industry to be approximately 5 percent.

Voice telephony is also offered by cable providers and no regulatory concerns regarding interconnection were raised during the research for this study.

5.4 Computer Availability

According to the State Department for Statistics (SDS), in 2003 there were approximately two computers per one hundred households in urban areas and less than one per hundred in rural areas.[31] According to the World Bank,[32] GNI in Georgia in 2005 was 1,350 US$ (1,115 Euro), meaning that purchasing even a basic computer (estimated for the purposes of this study at 420 Euro) was beyond the reach of most consumers.

5.5 Internet Access

The Internet access market is very dynamic in Georgia, at least in urban areas. There are cable, satellite, dial-up Internet, Wi-Fi, WiMAX and ADSL service providers, which provides for a very competitive environment in what is, as yet, an extremely limited marketplace. The market breakdown for Internet access providers in Georgia is currently as follows:

Internet Access Providers in Georgia[33]

Rank	Company	%	Technology

[31] See http://www.statistics.ge

[32] See http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf

[33] This information is from the marketing department of UTG.

1	Telenet	30	First provider of Broadband GPON[34] access. Leased lines, dial-up, VoIP, Wi-Fi Triple play is planned at 2007
1	Sanet and Georgia on Line (GOL) were merged to create the Caucasus Network (ICN) in 2006	30	Leader in ADSL access Broadband, leased lines, Dial-up, VoIP, Wi-Fi
3	Global-1	10	Broadband, leased lines, dial-up, VoIP, Wi-Fi
4	GeoNet	5	Broadband, leased lines, Dial-up, VoIP, Wi-Fi
4	WaneX	5	Leased lines, point to point connections for VPNs, dial-up VoIP
4	Egrisi	5	Satellite DVB and leased lines
4	Railway Telecom of Georgia	5	Carrier provider, dial/up, VoIP
4	Deltacom	5	Trunk connections, leased lines
9	Grena	3	Broadband, leased lines, Wi-Fi
10	DCN	1	Broadband, dial-up VoIP
10	Makrocom	1	Cable, VoIP

Internet access services are available though both dial-up (56kbps) and ADSL at a range of speeds, from the equivalent of European ADSL "light" services to 8Mbps. There is extensive competition in the dial-up market, with prices starting from 0.45 Lari per hour (0.20 Euro). As an example of ADSL prices, Sanet's service (65k/256k) costs 39 US$ (32.23 Euro) per month.

It was estimated that there were around 175,600 Internet users in Georgia in 2003. ITU statistics indicate that this figure increased to 200,000 (4 percent penetration) by September 2005.[35] Revenue from Internet access services in Georgia was 19.8 million GEL (9.1 million Euro), which is an increase of 22.4% over 2004.[36] There were 15,300 ADSL lines in Georgia at the end of 2005.

UTG has been investing heavily in Tbilisi, rolling out a gigabit Ethernet network and 17 DSLAMs, offering the possibility for providing triple play services across the capital in the near future.

5.6 Public Internet Access Points (PIAP)

Some work has been undertaken by international organisations, such as the Internet Access and Training Program of the International Research and Exchanges Board,[37] in

[34] Gigabit Passive Optical Network

[35] Quoted in Internetworldstats.com - http://www.internetworldstats.com/asia.htm

[36] GNCC Annual Report, 2005

[37] http://www.irex.org/programs/iatp/index.asp

order to provide PIAPs and training both in Tbilisi and in regional centres. This has led to three PIAPs in libraries and universities in Tbilisi, two in Kutaisi and one each in Batumi, Gori, Khashuri, Poti, Rustavi, Telavi and Zugdidi.

According to Telenet, the regional authorities in Batumi intend to launch a free Wi-Fi hotspot in Ajara as a free municipal service, using the Telenet network.

5.7 Wireless Access Services

The ISP Iberiatel,[38] which has recently merged with Telenet,[39] provides wireless competition to fixed networks in some areas, such as Telavi. Telenet provides wireless local loop services, Internet access services and holds licences for CDMA 800 and CDMA 450. In addition, in February 2006, Telenet received a licence for the 5.2GHz frequency, to add to its existing 5.7GHz licence. It now provides services in both frequencies.

Telenet provides wireless local loop services, Internet access services and hold licences for CDMA 800 and CDMA 450. Telenet received a licence for the 5.2GHz frequency for Tbilisi. It now provides services in 2.4, 5.2, 5.7 GHz countrywide.

Telenet uses Motorola “Canopy” technology both to provide wireless competition for fixed line services and also to provide advanced communications services to areas which previously had no opportunity to connect to the national telecommunications network. Telenet has also started deploying a national wideband transport network covering the entire territory, using wireless, fibre optic and powerline communications.

[38] http://www.iberiatel.ge/
[39] http://www.telenet.ge/en/about.html

6 AVAILABILITY OF ONLINE SERVICES

6.1 E-Commerce

According to interviews carried out for this study with ICT organisations in Georgia, only about one third of businesses have websites, although no clear statistics are available regarding either how these can be divided between SMEs and large organisations or between sites that target B2C and B2B.

Unsurprisingly, bearing in mind the lack of key pieces of legislation regarding e-commerce, e-banking has taken some time to take off. However, possibly in the anticipation of this problem being resolved in the near future, services are now starting to appear. For example, the TBC[40] bank has been quite active in international projects, having joined SWIFT in 1996 and integrating into the Visa Electron credit card system. It now provides a basic range of online services to customers including phone card purchase, utility bill payments, account history and various account status operations.

A second problem, which is keeping innovative e-services offline, is the lack of Internet penetration in the country. TBC bank uses the Russian Spylog[41] web-counter system. The public logs of the TBC bank indicate that the website as a whole (not the e-banking section) receives only about four hundred hits per day. However, once the legal framework is in place and services like this become more commonplace and trusted, the framework will be in place to allow this market to develop.

Finally, it is interesting to note that TBC, perhaps addressing consumer fears regarding security in the online world, does not hold customers personally liable for any unauthorised transactions via their online account as long as the consumer abided by the terms of the service agreement, which places minimal requirements on consumers, such as using an up-to-date browser and basic password precautions.

TBC bank has also teamed up with Intellectbank and UFC International to provide innovative e-services for their card payment customers. The services include SMS-based services, which enable users to avail of their cards to pay for utilities and phone services via their mobile phones, and to block their cards in case of theft or loss.

6.2 E-Government

E-Government has not yet taken off in Georgia, which is understandable when the rather low level of Internet penetration in the country is considered. It is the Georgian Government's intention to start launching their first e-Government services in the short to medium term.

[40] http://www.tbcbank.com.ge/en/private/

[41] http://www.spylog.ru/

The majority of ministries still do not have websites, and those that do only include very limited information. However, the number of ministries with websites has grown significantly in the course of the past four years. In 2001, there were nine Government Ministry and Department websites (at that time, several Departments did not even have Internet access). The availability of websites and computerisation within the government has now improved significantly. New websites that have been created include those of the Ministry of Justice[42] and the National Library.[43]

A further e-government project is a joint effort of the World Bank and the ITU. In 2003, the World Bank undertook a project to digitise all documentation in the Ministry of Telecommunications in Georgia. In the course of this project, the World Bank asked the ITU to set up a document transmission, retrieval and security system. The ITU took this opportunity to provide solutions to enhance work flow automation, by enabling officials to digitally sign and disseminate official documents, thereby replacing the slow and rather expensive paper-based methods. There was a two-fold logic in this approach: on the one hand, it was a step towards creating an efficient system in the Ministry and, on the other, it was designed to give officials in the Ministry the opportunity to get accustomed to working with digital signatures, thereby improving their ability to legislate on this important e-commerce issue. However, there are as of yet few visible results from this project.

Work is now underway in a major push for comprehensive e-government programme called the Georgian Government Network, using Cisco networks (under a one million US$ / 826,000 Euro) contract and with the expert advice of the national REN, GRENA, which has already worked extensively with Cisco. The project will build a network between government offices in Tbilisi and between the capital and regional centres. This, it is planned, will form the basis on which to build future e-government projects.

The network itself will be entirely virtual, relying on existing infrastructure for its capacity.

6.3 E-Health

E-health is being actively promoted by the Georgian Telemedicine Union,[44] whose activities include telepathology, education, organisation of conferences and the development of policy for particular scenarios, such as e-consultations for conflict regions. It also developed a proposal for the creation of an e-health national network in Georgia. However, this has not yet been implemented.

The National Information Learning Centre[45] provides online and offline medical information for medical professionals and students, an FTP server, training and Internet access.

[42] http://www.justice.gov.ge
[43] http://www.nplg.gov.ge
[44] http://georgia.telepathology.org/
[45] http://www.nilc.org.ge/

6.4 E-Learning

As part of the cooperation between Estonia and Georgia in the Information Society sector, Georgia is trying to emulate the successful Estonian Tiger Leap Programme.[46] The Tiger Leap Programme was established in Estonia to develop ICT use for education and is generally considered to have been very successful.
The Georgian Deer Leap Project[47] has four distinct phases (of which the first two have been completed):

(1) Analysis of the current e-education system in Georgia by liaison between Estonian and Georgian officials.
(2) Detailed research in order to understand the framework in Georgia including meetings and visits with key Georgian institutions.
(3) Development of the overall plan for Deer Leap.
(4) Implementation of the project.

It is worth noting, both in this context and as a sign of the wider problems with Internet and ICT use in Georgia, that the project's coordinators complained from an early stage about the "marginal" approach to technology in Georgia's education system. There was difficulty caused by the fact that the infrastructure was so poor within the schools participating in the project and also because ICT was considered as a subject in its own right and not as a general tool for education. A key aspect of Stage 4 of the process was described by the Estonian egovernance academy website as follows: "*In order to change the attitudes of Georgian teachers and school principals and to demonstrate the educational value of ICT in all subjects and grade levels, the best practice cases from Estonian schools should be demonstrated by the authors and coordinators of the successful Internet-projects to Georgian colleagues*."[48]

A full overview of the project, including budgets, overall strategy, documents relating to meetings that took place during the planning of the project and other useful information can be obtained from http://www.htk.tpu.ee/TLG. The first draft of the next stage of the project was published on the website in November 2005.

According to the research carried out for the Deer Leap Project in Georgia, more than three-quarters of schools have more than ten computers. However, these tend to be quite out of date and generally not equipped with Internet access. According to the United Nations Country Assessment Report of 2002, there was one computer per 707 pupils in Georgian schools, with an average of 0.3 computers per institution. As a result of the project, 800 schools have now been connected, with 7,000 computers installed. By 2008, it is planned that 2,300 schools will be connected and the ratio of computers to pupils will drop from its current level of 1:35 to 1:20, with a total of 30,000 computers being supplied. 70% of teachers will receive training to support the practical rollout network and hardware rollout. A two-phase tender has been launched for the hardware and expertise necessary to ensure successful completion of the project.

[46] http://www.tiigrihype.ee/eng/index.php

[47] http://www.htk.tlu.ee/TLG

[48] This information comes from the article "Tiger Leap in Georgia" which can be accessed on the Estonian egovernance website http://www.ega.ee/?id=26339.

Plans are also underway to increase use of the national research and education network (GRENA).[49]

The Internet Access and Training Programme and International Research and Exchange Board[50] also organises courses and services to boost e-skills in Georgia.

The "Creating e-Societies in the Southern Caucasus" project, funded by the European Commission, started in September 2005 and is due to last for two years. This includes a significant e-learning component.

A Wi-Fi network has been established in Tbilisi for academic purposes.

The number of schools with a computer has risen significantly in the last three years, from 9.8% in 2004 to 10.1% in 2005 and to 24.8% in 2006.[51]

[49] http://www.grena.ge/

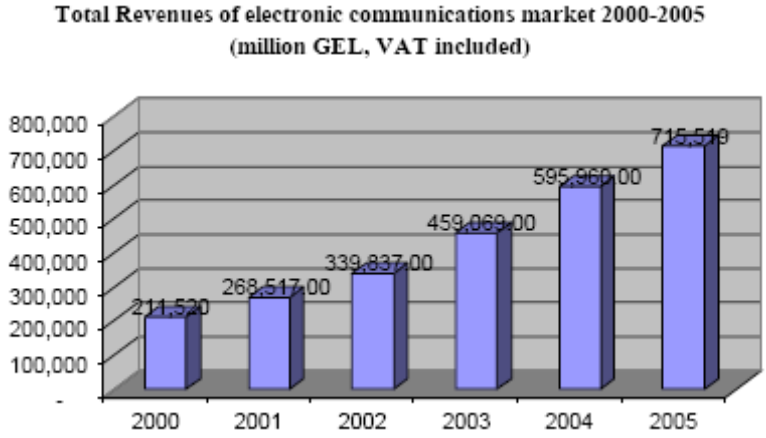
[50] http://www.irex.org/programs/iatp/

[51] Statistics Georgia - http://www.statistics.ge/_files/english/education/8e.doc

7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY

The communications market is extremely vibrant, with 18 Internet and data networks, 4 mobile operators, 34 international telephony providers and 30 local telephony providers. The growth rate of the sector has been very high in recent years, 28 percent in 2002, 30 percent in 2003 and 34 percent in 2004. The fixed line market still has enormous potential, with a waiting list, which is equivalent to 38 percent of the existing fixed line market.[52]

The table below, from the 2005 GNCC annual report shows the strong growth in revenue experienced by the Georgian electronic communications market in the period 2000-2005.



7.1 Fixed Networks

There is a considerable degree of state ownership in the communications market. However, this was reduced significantly in January 2005, when the Government's full 51 percent share of Georgia Telecom[53] was transferred to Telcell, a wholly-owned subsidiary of Metromedia,[54] a US company which also owns a significant share of the mobile operator Magticom. Nonetheless, state enterprises had a 15.1 percent share in the output of the communications market in the first quarter of 2005. The two former state-owned fixed telephony service providers are listed below.

Company	Services	Owners
Georgia Telecom (Sakartvelos Telekomi)[55]	International fixed line and long distance	Metromedia (US) 81% Bulcom (Cyprus) 19%
Georgian Local Lines Company (Sakartvelos Elektrokavshiri/UTG)[56]	Local services and infrastructure	90.3% owned by Turan Alem Bank (KZ), the remainder owned by employees.

[52] Data from UTG, February 2006

[53] http://www.telecom.ge/

[54] http://www.metromedia-group.com/

[55] http://www.telecom.ge/index.php?class=1&lang=eng

7.2 Mobile Networks

The Georgian mobile market has to compete with the very vigorous fixed market. There are two main GSM operators, with additional competition planned in the near future from Magticom and Telecom Invest Georgia, both of which have been awarded 3G licences. A further licence is to be auctioned in September 2006.

Company	Services	Owners
Geocell[57]	Mobile operator	Georgia Telecom (2%), United Telecom of Georgia (12%), Turkcell (Turkey) (40%), Celcom (46%)
Magticom[58]	Mobile operator including GPRS	Magti Group (Georgia) (49%, Telcell Wireless (51%)(USA)
Iberiatel[59]	Local telephone, NMT, CDMA	Private ownership 100%

According to the 2005 GNCC annual report, revenues of mobile operators increased by 30.4% in 2001, 34.8% in 2002, 40.4% in 2003, 33.9% in 2004 and 19.7% in 2005.

7.3 Cable Networks

Cable services represent approximately 2% of revenue for communications in Georgia.

7.4 Internet Access Networks

There are approximately fifty Internet access providers in Georgia, providing dial-up, satellite, Wi-Fi and Cable services.

The principal ISPs are:

- **Telenet (including Iberiapac)**, which provides advanced data services to businesses and information exchange to Georgian banks, advanced, high speed wireless solutions using Motorola Canopy (5.7GHz) technology and Internet access and web hosting services. Telenet's acquisition of Iberiatel was undertaken partly in order to roll out a CDMA-450 IP-based data and voice service covering the full territory of Georgia.

[56] http://www.gec.ge/

[57] http://www.geocell.ge/v2/eng/index.php

[58] http://www.magtigsm.com/

[59] http://www.iberiatel.ge/

- **Georgia Online**, which has grown substantially, allegedly benefiting from a huge degree of advertising donated by its parent company, the television company Rustavi 2. It provides dial-up access (including prepaid), hosting and leased lines.
- **Sanet** is present in three large cities (Tbilisi, Kutaisi and Poti) offering leased lines and dial-up (including prepaid)

7.5 Production of IT Services

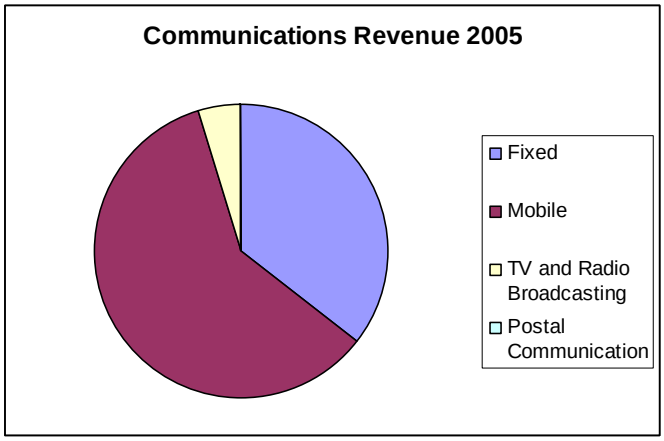
IT services are an insignificant part of the Georgian economy and are not the subject of specific research by the state statistics agency – Statistics Georgia.

7.6 Financial Development of the ICT Sector

The extensive level of telecommunications liberalisation in Georgia means that there has been significant private investment in the sector. Operators reported an almost 100% increase in revenue between 2000 (at the early stages of liberalisation) and 2003. Year-on-year growth was in excess of 25% every year from 2000 to 2005, reaching 6.21% of GDP in 2005.

In 2005, mobile providers accounted for 54.95% of telephony revenue in 2005, with fixed operators accounting for 35.2%. The rapid growth of the sector has not shown any slow-down, with UTG (see above) reporting a huge demand for fixed lines while, in 2005, the mobile sector reporting a growth rate of 40.3% and ISPs reported a 71% growth.

In the course of 2005, there was an increase of 20% in the number of companies operating in the electronic communications market, with 230 companies in operation. In the period 2000-2005, there was a 240% increase in revenue for the communications sector, reaching 715.5 million GEL (329.58 million Euro). This income breaks down as follows:



Communications revenue from 2005 breaks down as follows:

Fixed Communications – 35.2% (252 million GEL)
Mobile Communications – 59.45% (425 million GEL)
TV and radio broadcasting – 4.4% (32 million GEL)
Postal service – 0.9% (6.5 million GEL)

Revenue in the ISP market was 19.8 million GEL (9.12 million Euro) according to the 2005 GNCC annual report, representing a 22.4% increase over 2004.

Political Intelligence

INTERNEWS

Kazakhstan

Local Expert: Andrew Beklemishev

Table of Contents

1 OVERVIEW 4
1.1 Regulation of Electronic Communications 4
1.2 Regulation of Online Services....5
1.3 Use of Information and Communications Technologies 5
2 GENERAL ENVIRONMENT 7
2.1 Influence of non-public stakeholders on regulation and policy 7
2.2 National Development Plans....7
2.3 Data Protection 9
2.4 Cybercrime and Spam 10
3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 11
3.1 Interconnection 11
3.2 Numbering 12
3.3 Rights of Way and Facilities Sharing/Collocation 13
3.4 Tariff Policy 14
3.5 Cost Accounting....14
3.6 Universal Service 15
3.7 Local Loop Unbundling 16
3.8 Leased Lines....16
3.9 Mobile Services....17
3.10 Satellite Services 18
3.11 Resources of National Regulatory Authorities (NRAs) 19
3.12 Licensing and Authorisation....20
3.12.1 Mobile operators: 20
3.12.2 Fixed operators: 21
3.12.3 Internet access providers: 21
3.13 Spectrum....21
4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 23
4.1 Digital Signatures....23
4.2 Payment systems....23
5 USE OF ELECTRONIC COMMUNICATIONS SERVICES....25
5.1 Fixed Telephony Penetration 25
5.2 Mobile Usage 25

5.3 Cable Network 25
5.4 Computer Availability 26
5.5 Internet Access 26
5.6 Public Internet Access Points 28
5.7 Wireless Internet Access 28
6 AVAILABILITY OF ONLINE SERVICES....30
6.1 E-Commerce....30
6.2 E-Government....30
6.3 E-Health....32
6.4 ICT Connectivity in Schools....32
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY....34
7.1 Fixed Line Market 34
7.2 Mobile Market 35
7.3 Communications Market Overview 35
7.4 Ownership Structure of the Wider ICT Industry 37

1 OVERVIEW

The current independent state of Kazakhstan was declared in 1991. It has a population of 15.4 million people with a land mass of 2.7 million square kilometres. The GNI per capita was 1,860 Euro in 2005, according to the World Bank. Kazakhstan is a constitutional republic with a President and a bicameral legislature. The country consists of 14 provinces and 3 municipal districts.

1.1 Regulation of Electronic Communications

Existing problems with regard to interconnection are now being actively addressed by the competition regulator – ARNM (Agency for the Regulation of National Monopolies). ARNM, along with the AIC (Agency for Informatisation and Communications), both serve as national regulatory bodies, although they are not independent of government. The AIC is responsible for all aspects of electronic communications regulation, except tariff policy, which is the domain of ARNM.

The Kazakhstan incumbent is obliged to publish a RIO and may not refuse interconnection. The AIC has also drawn up model interconnection agreements. Local loop unbundling does not exist and there are no plans for its introduction.

Numbering resources are managed by the AIC. Numbering is generally managed on a non-discriminatory basis, although geographic numbers are not available for VoIP providers.

There are regulations for facilities sharing established by Kazakhtelecom and are available for download from its website.[1] Where there are problems, these are usually addressed by the AIC.

Tariff rebalancing is underway in Kazakhstan, although there is some criticism that this is progressing at an unduly slow pace.

A Fully Distributed Cost with Historic Costs methodology method was introduced for cost accounting at the beginning of 2005. A review of its implementation is currently being undertaken by the ARNM.

A basic universal service policy was introduced through the 2004 Law on Communications. A universal service fund may be introduced in the near future, although no precise plans are available regarding how this would be financed. A key priority was to ensure that all settlements have phone access by the end of 2006. Figures are expected to be published in early 2007 to show if this target has been met.

There are no obligations on any provider to ensure the availability of leased lines at all points in the country. The market is quite untransparent, as it is governed primarily by commercial arrangements between market players.

[1] http://www.telecom.kz

Due to the geography of Kazakhstan, satellite communications are very important. The provision of satellite services is expected to improve following the launch of the Kazsat communications satellite.

There is no data protection legislation in Kazakhstan, although it is expected that a law will be published in 2007.

1.2 Regulation of Online Services

Kazakhstan adopted legislation on e-documents and e-signatures in 2003. However, the rules are quite complex and the necessary administrative elements are not yet all in place.

While the rules regarding the deliberate dissemination of illegal content are clear in Kazakhstan, the role of ISPs as "mere conduits" is not clear, nor is the situation regarding hosting providers unknowingly hosting illegal material. With regard to online child abuse images, all distribution of pornographic material is prohibited in Kazakhstan. While e-commerce is in a comparatively under-developed state in Kazakhstan, the e-banking sector is exceptionally advanced. Nevertheless, although most of the 35 banks operating in Kazakhstan have implemented online banking systems for corporate customers, only 5 have implemented online banking systems for individual customers.

Legislation on intellectual property have undergone significant changes in the recent years; however, additional work is needed.

1.3 Use of Information and Communications Technologies

Fixed network penetration is running at 17.9%,[2] buoyed by strong competition between seven major fixed line service providers. Approximately half of all telephone exchanges are now digital. The mobile penetration rate is quite significant (35.6%[3]) and growing very quickly.

While use of online services is still at quite a low level, the Government has adopted a very sophisticated and comprehensive approach towards the development of the information society, including a specific plan on the development of e-government services. If this is successful, it should form the basis of increased trust in, and impetus to use, online services.

A 2005-2007 action plan for e-government foresees a three-phase development of online services, starting with the development of basic online services, moving on to more interactive services and finally advanced e-health, e-education, e-culture and e-democracy services. Kazakhstan's score increased significantly from 2.6 (out of 10) to

[2] "Transport and Communications in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[3] "Science and Innovation Activity in Kazakhstan in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

2.97 from 2004 to 2005 in the Economist e-readiness rankings and reached 3.22 in 2006, attaining its best mark for business environment (5.37 – unchanged from 2005) and worst for consumer and business adoption (1.95 – up from 1.7 in 2005).

2 GENERAL ENVIRONMENT

2.1 Influence of non-public stakeholders on regulation and policy

There is only one association of telecoms service providers in Kazakhstan, the National Telecommunications Association. All major telecoms operators are members of this Association (with Kazakhtelecom having observer status). All tier-one ISPs are members of the National Telecommunications Association. Small ISPs are not organised in any form of association.

The National Telecommunications Association has proven itself to be very active and effective in lobbying on behalf of members. The Association is a member of the consultative council of the AIC (Agency on Informatisation and Communications) where it takes an active role in reviewing all upcoming changes in the industry, including examining and commenting on draft legislation.

A Council of Operators, under the chairmanship of Aben A. Bektasov, the Chairman of the Agency on Informatisation and Communications took place in June 2005. This meeting led to the setting up of a Commission on interconnection issues and a second on traffic flow issues. The aim of the Council is to improve the legal basis for a range of communications issues.

From a consumer perspective, the closest Kazakhstan has to user groups are the consumer protection NGOs that have proven to be very effective in the past. These include the Association of Protection of Consumer Rights[4] and the National League on the Protection of Consumer Rights[5].

There are no particular barriers to the setting up of associations, including trade associations, in Kazakhstan. The Law on NGOs governs all associations and this law is very "user-friendly." Overall, the number of associations in Kazakhstan has grown significantly in the past years and the effectiveness of these associations is relatively high. Generally, businesses are inclined to join the relevant associations in Kazakhstan and place a high degree of trust in them.

2.2 National Development Plans

Kazakhstan developed an extensive plan for the development of the telecommunications sector in 2003, entitled “The Programme for the Development of Telecommunications Sector in the Republic of Kazakhstan for 2003-2005.” The Programme not only set out a series of goals but also enumerated a detailed methodology regarding the approach for dealing with problems in the sector, the financing of the project, the expected benefits of the programme, and a substantial list of

[4] http://www.cango.net.kg/homepages/kz/nacrps/

[5] http://www.potrebitel.kz

action points that needed to be undertaken in order to achieve these goals. The expected benefits of the programme included:

- Establishment of a single regulatory and legal framework in the telecoms sector to ensure improved efficiency of government regulation;
- Creation of a competitive environment in the telecoms market, including more possibilities for the development of local access lines and value-added services;
- Establishment and provision of a system for the training of experts in the context of the rapid development of the sector; and
- Fostering of an investment level conducive both in the short- and long-run to the development of the sector.

The programme recognised the key competition issues that needed to be addressed to ensure the positive development of the sector. As a result, it was planned:

- To eliminate the non-transparent cross-subsidisation of services;
- To introduce cost accounting;
- To introduce rebalancing and a set of “economically sound tariffs” to create competition in market segments previously considered unattractive to business; and
- To create a fully market-oriented sector in order to lay the basis for the sustainable long-term development of the telecoms sector.

The Kazakhstan authorities produced a list of forty-five different and comprehensive actions that would need to be undertaken in order to ensure that the programme was successful, detailing the government agencies that would be responsible for each of the action points, the implementation deadline, the expected costs and the source of financing for the actions.

This level of coherence and sense of purpose has been maintained over the course of the past two years. A scorecard, which is not publicly available, has been seen by the study team which shows the durability of the government’s focus on the programme.

This scorecard shows that, despite some inevitable slippage regarding exact deadlines, the Kazakh civil service achieved most of its legislative targets.

In 2006, Kazakhstan developed a follow-on plan for the development of the telecom sector entitled “The Programme for the Development of Telecommunications Sector in the Republic of Kazakhstan for 2006-2008.” The programme aims to continue the reforms that were started with the previous programme and its targets to be achieved by the end of 2008 include:

- Fixed line penetration of 23%
- Mobile penetration of 50%
- Internet penetration of 10%
- 80% digitalisation of local telecommunications networks
- Revenues of communication service providers 4-5% of GDP
- Telecom revenues of 150-200 US$ (124 to 165 Euro) per resident
- Telecom sector investments of 70-100 US$ (58 to 83 Euro) per resident

The following priority tasks need to be completed to achieve the above mentioned targets:

1. Improvement of state regulation in telecom sector:
    - More research to further develop the telecom sector
    - Better interconnection of operators
    - development of fixed and mobile communications through further rebalancing, connection of VoIP operators to the PSTN, improved mobile interconnection, etc
    - development of Internet, including measures to improved broadband access, increase metro Ethernet services by Kazakhtelecom to reduce access prices and create PIAPs using Kazpost infrastructure
    - provision of universal telecom services to population

2. Innovation technology and technical provisions for the telecom sector:
    - innovative development of the telecom sector
    - numbering resource allocation
    - improvement of radio frequency spectrum allocation
    - development of the national satellite communications
    - improvement of standardisation and certification in the telecom sector
    - organisation of a system for human resource training and re-training in the telecom sector
    - provision for security- and law enforcement-related activities with the use of telecom networks

The “Programme on Bridging the Digital Divide in Kazakhstan” was approved by the Government of Kazakhstan in October 2006 in order to increase access to communication infrastructure and information resources, as well as to e-government services.

Three main goals of the programme are: 20% computer literacy rate, 20% Internet penetration rate (which, oddly, is twice the target rate in the Programme for Development of the Telecommunication Sector, which was adopted at almost the same time) and an increase in the role information systems play in life of an average citizen. These goals will be realised through creation of training centres and public internet access points, reduction of internet access tariffs and the cost of computers.

2.3 Data Protection

There is currently neither a Data Protection Authority in Kazakhstan nor comprehensive data protection legislation. There will be a provision for the establishment of a Data Protection Authority in the Law on Data Protection that is currently in progress. It is currently unclear when this law will be approved.

On October 10, 2006 the President of Kazakhstan signed a decree that approved the Concept of Information Security. The Concept provides general information on possible threats to information security of the country and will serve as a reference point for all

further developments related to information security. It is expected that a Law on Data Protection (or Law on Information Security) will be adopted based on this concept paper.

2.4 Cybercrime and Spam

Kazakhstan has neither signed nor ratified the Council of Europe Cybercrime Convention (which is open to non member countries), but has signed and ratified the Optional Protocol of the Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography.

The Law on Mass Media (1999) prohibits the dissemination of all pornographic materials.

Intellectual property rights (IPR) are protected in Kazakhstan by the Law on Intellectual Property passed in 1996 and later amended in 2005. Software piracy nevertheless remains one of the major issues for Kazakhstan's growing software market. According to an annual Software Piracy Study by the Business Software Alliance and IDC, Kazakhstan is currently rated at number six among top twenty countries with highest software piracy with 85% of software installed in 2005 being pirated. One worrying statistic is that Kazakhstan's software piracy rate has remained constant in the period 2003-2005.

On November 22, 2005 Kazakhstan adopted a law On Changes to Various Legal Acts on Issues of Intellectual Property Rights. As a result, amendments were made to Criminal Code, Administrative Code, Civil Code, Tax Code, Budget Code and a number of laws. The amendments are aimed at increasing the penalties for infringement of intellectual property rights and improvement of their protection. One of the results Kazakhstan was able to achieve was its removal from the Special 301 Watch List, published by Office of the United States Trade Representative "due to progress on copyright enforcement." [6]

The rules regarding the deliberate dissemination of illegal content in Kazakhstan are clear; although the role of ISPs as "mere conduits" and the situation regarding hosting providers unknowingly hosting illegal material has never been clarified.

There is no legislation regarding the sending of unsolicited electronic communications.

It is expected that additional legal acts to prevent cybercrime will be developed based on the recently approved Concept on Information Security (see Data Protection section above). That document also makes unclear statements regarding the need to introduce legal measures to control Internet traffic and identify harmful and "negative" content. This implies potentially far-reaching measures to limit access to online information.

[6] 2006 Special 301 Report, Office of the United States Trade Representative, http://www.ustr.gov/assets/Document_Library/Reports_Publications/2006/2006_Special_301_Review/asset_upload_file473_9336.pdf

3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS

3.1 Interconnection

Access and interconnection are governed by Law 567-II On Communications, the Rules of Interconnection of Telecommunication Networks to the Public Switched Telecommunication Network and Regulation of Traffic Flow in the Public Switched Telecommunication Network of the Republic of Kazakhstan, and by various Orders of the Agency on Natural Monopolies (relating to methodologies and tariffs).

There have been problems regarding tariffs for interconnection between the incumbent (Kazakhtelecom) and competing operators. The Government, supported by the AIC, has been addressing these problems. Model interconnection agreements have been drawn up by the AIC for different levels of interconnection and the incumbent is obliged to interconnect with other operators. Crucially, "*a dominant operator cannot refuse to conclude an interconnection contract. In the event of evasion from the conclusion of a contract, a court can rule on non-conditional contract conclusion and reimbursement of damages to another party.*"[7]

The incumbent is obliged to publish an RIO which is available for download at its website.[8]

Legal provisions for carrier preselection came into force on 1 January, 2006. However, these are not supported by the incumbent and consequently there are no offers on the market.

The new telecommunications sector development programme approved by the Government of Kazakhstan in 2006 calls for changes to be made to the Rules of Interconnection of Telecommunication Networks to the Public Switched Telecommunication Network and Regulation of Traffic Flow in the Public Switched Telecommunication Network of the Republic of Kazakhstan. It is unclear what these changes will be. The programme also calls for possibilities for IP Telephony operators to freely connect to PSTN.

There are 369 active local phone companies, seven international and long distance service providers, and over 1000 licences issued for telecommunications services.

7 Law of the Republic of Kazakhstan # 567-II "On Communications" adopted July 5, 2004

8 http://www.telecom.kz

National long distance tariff rates

National long distance tariff rates for outgoing traffic of interconnected operators through the Kazakhtelecom network, depending on distance, per 10 second interval, exclusive of VAT (15%) in euro cents	
Up to 100 km	0.55
101 - 300 km	0.63
301 - 600 km	0.71
601 - 1000 km	0.90
From 1000 km	0.95

National long distance tariff rates for outgoing traffic from Kazakhtelecom's network terminated in an interconnected operator's network, depending on distance, per 10 second interval, exclusive of VAT (15%) in euro cents	
Up to 100 km	0.74
101 - 300 km	0.83
301 - 600 km	0.94
601 - 1000 km	1.20
From 1000 km	1.27

There are four mobile operators, of which two control the vast majority of the market (GSM Kazakhstan[9] and Kartel[10]).

Revenue sharing is available for dial-up ISPs, which allows this market segment to grow profitably. There are two options for providing dial-up services. Prepaid cards are the most common way of using dial-up Internet from alternative (especially small) Internet service providers. Alternatively, the customer can opt to receive one bill, with the ISP working out the revenue share with the fixed-line incumbent.

Significant problems have not been identified regarding the termination of VoIP calls on the Kazakhtelecom network.

3.2 Numbering

The Rules on Allocation and Use of Numbering Resources of Telecommunications Networks in the Republic of Kazakhstan govern the issue of numbering in Kazakhstan.

In Kazakhstan, the AIC is responsible for the allocation of numbering resources.

The Law on Telecommunications and the Rules on Allocation and Use of Numbering Resources provide that numbering resources should be equally available to all operators. However, in practice, numbering resources are not equally available to all communications service providers in Kazakhstan. It is expected that the situation will improve in the near future due to numbering reforms.

[9] http://www.kcell.kz

[10] http://www.k-mobile.kz

The Government introduced a new numbering system in Almaty in 2006 and starting November 26, 2006 the city switched from 6 digit to 7 digit phone numbers, which will significantly improve the availability of numbers in the city.

The Rules on Allocation and Use of Numbering Resources stipulate that VoIP service providers are entitled to numbering capacity using non-geographic numbers. Providers of VoIP services apply for the numbers in the same way as any other telecom operator: in other words, current legislation does not directly discriminate against providers of VoIP services. New rules requiring preselection to be offered by communications providers entered into force on 1 January 2006.

A subscriber can keep an existing fixed phone number when changing service provider as long as:

- The subscriber does not change his place of residence;
- The operator has sufficient numbering capacity; and
- The contract with the previous service provider does not have provisions which prevent the number from being ported.

There are no clear guidelines as to whether the consumer has to pay for portability. It is usually determined on a case-by-case basis dependant on the contract with the provider.

3.3 Rights of Way and Facilities Sharing/Collocation

Operators are free to establish agreements between each other for facilities sharing. There are no specific provisions in the law for collocation, although there are general non-discrimination provisions in the Civil Code. Kazakhtelecom posted guidelines for facilities sharing on its website in 2006. However, they are considered quite untransparent and insufficient as they allow for “Technical Conditions” to be created by Kazakhtelecom for each case of facilities sharing and these conditions can require practically anything from the requesting party.

The vast majority of planning decisions with regards telecoms infrastructure are made at local government level with the exception of large national projects (such as a fibre optic line connecting Almaty and Astana). However, as local governments do not generally have their own telecommunications services, this is less of a problem than it could otherwise have been.

There is no specific appeals procedure associated with telecoms infrastructure and rights of way. Usually, operators will first appeal to the Agency on Informatisation and Communications in case of denial of access. Courts will be the next option. Some operators indicate that appeals made to the Agency on the Regulation of Natural Monopolies are usually effective although others have claimed that, even after a year of appeals, both to the Agency and in courts, they are still denied access to build new infrastructure.

3.4 Tariff Policy

Tariff rebalancing is currently underway in Kazakhstan, although implementation is considered by some analysts to be progressing too slowly. Fixed telephone charges were increased by 20% in 2004 and international long distance call charges were reduced, also by 20%. A second wave of price adjustments that was planned for the second half of 2005 did not, in fact, take place and the bulk of rebalancing remains to be undertaken. The AIC has indicated that there is no clear timeframe to complete tariff rebalancing; the plan will be determined by ongoing market analysis.

The AIC plans to conduct thorough market analysis once yearly with monitoring and updates conducted at 6-month intervals. According to the Agency on Regulation of Natural Monopolies report for the second quarter of 2006, the analysis has not yet been completed.[11] One of the explanations for a slow rebalancing rate is that in Kazakhstan, as in other parts of the former Soviet Union where residential telephones were assigned without regard to commercial viability, there is a significant number of households that cannot afford commercial prices and would be forced to disconnect from the network. However, the Government has already taken steps to counter this problem and has created a system of loss compensation for operators to help low-income households pay utility bills. This protects low-income families from having to give up their service as prices are rebalanced to commercial levels.

According to the AIC, the tariff-rebalancing model being used in Kazakhstan is comparable with the EU. The World Bank has provided the Agency with advice on best practice and has been consulted on the tariff rebalancing model. However, according to the statement made by World Bank experts at the High Level Brainstorming Seminar on Telecoms in February 2005, things are not moving as quickly as they should.[12]

3.5 Cost Accounting

A Distributed Cost Methodology was developed and approved by the Agency for the Regulation of Natural Monopolies in December 2003.[13] The Agency is the Government body responsible for telecoms tariff regulation in Kazakhstan, amongst other activities.

The methodology came into force on 1 January 2004 with a one-year adjustment period. Operators had to adhere to the new methodology from 1 January 2005 and submit a report every six months. The first reporting deadline for operators was 15 August 2005. The Agency on the Regulation of Natural Monopolies is currently compiling reports on

[11] ARNM 2nd Quarter Report available at http://www.regulator.kz accessed on November 10, 2006

[12] http://siteresources.worldbank.org/INTKAZAKHSTAN/Resources/BackgroundPaper11_TelecomBrainstormingFeb05_eng_final.pdf

[13] "Rules on conducting separate accounting of revenues, expenditures and involved assets of communications operators by types of telecommunication services regulated according to legislation on natural monopolies and antimonopoly legislation" approved by Order #312-OD of the Chairman of the Agency for the Regulation of Natural Monopolies on 12 December 2003

the effectiveness of the new methodology, on how well the operators were able to adjust to the new cost accounting mechanism, and to what degree the rules are being observed. According to the Agency on Regulation of Natural Monopolies report for the second quarter of 2006, the analysis has not yet been completed.[14]

The cost model is comparable with the Fully Distributed Cost methodology with Historic Costs (FDC-HC), which was used in some EU countries but advised against in the Commission Recommendation of 8 January 1998 on Interconnection Pricing (98/158/EC).

According to the AIC, the current accounting system is considered to be comprehensive and transparent for local and national long distance calls, although non-transparent for international calls.

3.6 Universal Service

The concept of universal service provision was introduced in the Law on Communications in July 2004 and the list of services to be included under the umbrella of universal service was approved by the Government in August 2004.[15] The AIC does not consider the services listed to be affordable for the country due to a lack of developed telecoms infrastructure in rural areas, a view that is now supported by the Government.

The following elements of the Law on Communications and the Universal Services list differ from the EU Universal Service Directive:[16]

- Universal service will be limited to areas with populations of over 200 people;
- Directory enquiry services and directories are not in the universal services list. However, there is a provision that entitles all telecom service subscribers to free telephone access to emergency services;
- There are no special measures for disabled users;
- There are currently no measures in place to permit selective call barring by consumers.

Kazakhstan does not currently have a universal service fund. However, the AIC has indicated that the Government is planning to introduce one. Plans could emerge as early as 2007; though it is not yet clear how this will be financed.

On 27 September 2005 during the meeting of the Commission on Human Rights hosted by the President of Kazakhstan, the Chairman of the Agency on Informatisation and Communications, announced that, by the end of 2006, all of Kazakhstan municipalities would have fixed line access. Mr. Bektasov highlighted that there were around 800 rural

[14] ARNM 2nd Quarter Report available at http://www.regulator.kz accessed on November 10, 2006

[15] List of Universal Telecommunication Services, approved by the Decree of the Government of Kazakhstan no. 866 on 19 August 2004

[16] Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002, on Universal Service and Users' Rights relating to Electronic Communications (Universal Service Directive)

areas with populations of over 50 people (the reference to rural settlements with populations of over 50 people marks a small change in policy, as previous statements referred to settlements of over 200 people) that did not have access to fixed telephony. According to the Chairman, a joint Kazakh-Chinese-Russian joint venture will be providing connectivity for these areas.[17]

3.7 Local Loop Unbundling

LLU does not yet exist in Kazakhstan. Experts do not foresee the introduction of LLU for at least three years as so many basic concepts of market liberalisation have yet to be introduced or to show favourable results.

3.8 Leased Lines

Currently no operators are required to supply a minimum set of leased lines in the Republic of Kazakhstan. Conditions and payments for leased lines are determined by individual agreements between operators.

There are no special regulatory requirements established for transparency, non-discrimination and cost-orientation for the supply of leased lines and/or leased line part circuits other competition law.

Lead times for the provisioning and repair of leased lines are determined by individual agreements between operators and vary according to the conditions set in the specific agreement.

The Agency for the Regulation of Natural Monopolies is only concerned with monitoring the dominant operator – Kazakhtelecom. However, as the methodology for accounting separation has been introduced only recently this monitoring has yet to commence.

As leased lines are dealt with through individual commercial contracts, it is difficult to gain information on leased lines from operators. Operators do not want to disclose any information, including prices, related to leased lines, as they consider that such information is commercially sensitive.

Neither the AIC nor Kazakhtelecom indicated any technical limitations for interconnection between leased lines and public telecommunications networks.

Kazakhtelecom offers the following prices for leased lines at range of speeds:

Line Speed	Price in Euro per month for all customers (except operators)	Price in Euro per month for operators
512 Kbit/s	2,425.43	4,851.891

[17] Source: Kazakhstan Today News Agency, accessed at http://www.gazeta.kz

768 Kbit/s	3,235.619	6,548.666
1024 Kbit/s	4,314.159	8,731.555
1536 Kbit/s	6,471.238	13,097.34
2048 Kbit/s	8,628.318	17,463.11
3 Mbit/s	12,132.29	23,296.45
4 Mbit/s	16,176.38	31,061.93
5 Mbit/s	20,220.48	38,827.42
6 Mbit/s	24,264.58	46,592.91
7 Mbit/s	26,418.24	50,955.61
8 Mbit/s	30,192.27	58,234.98
9 Mbit/s	33,966.3	65,514.35
10 Mbit/s	37,740.34	72,793.73

In 2006, Kazakhtelecom stated that the total capacity of its international connectivity was 665 Mbps. According to Kazakhtelecom the connections available are as follows:

- Almaty – Hong Kong, 155 Mbps
- Almaty – Moscow, 310 Mbps
- Astana – Frankfurt, 100 Mbps
- Astana – Moscow, 100 Mbps

Capacity in Kazakhstan is being continually improved. Towards the end of 2005, Kazakhtelecom completed the construction of the main ring of the National Information Super Highway (NISH) by launching the North segment of the network, which connected the Petropavlovsk – Kostanai – Aktobe sector. The NISH now consists of over 11 thousand kilometres of fibre-optic lines that connect oblast (regional) centres, Almaty and Astana (total of 14 large cities), and 116 smaller cities and towns. The full completion of the project is expected in 2007, with the connection of Aktobe and Uralsk to the main ring via fibre-optic lines.

3.9 Mobile Services

There are four licensed mobile operators in Kazakhstan. These are GSM Kazakhstan[18] (45% market share), Kar-Tel[19] (47.2% market share), Altel[20] (7% market share) and Telecom Service (0%). There are no 3G operators on the market and there are no immediate plans to award any 3G licences. However, Altel's CDMA 2000 technology is capable of providing 3G services, although it does not plan to launch any in the short term. There are also no MVNOs on the market.

[18] http://www.kcell.kz/en/

[19] http://www.k-mobile.kz/ru/

[20] http://www.altel.kz/

There are 6,103,000[21] mobile users in Kazakhstan, representing 39.9% (35.6%[22] at the end of 2005) of the population, based on the Kazakhstan's Statistics Agency figures from July 2006.

Taking GSM Kazakhstan as an example, standard prices are free subscription, plus 529 KZT (3.26 Euro) for the SIM card, with a monthly fee of 1589.49 KZT (9.81 Euro); there is no sign-up fee. A three-minute call to another network costs 114.45 KZT (0.71 Euro) while an SMS costs 7.96 KZT (0.05 Euro). Mobile Internet access costs 33.13 KZT/Mb (0.205 Euro) during peak hours and 19.88 KZT/Mb (0.12 Euro) off peak. Mobile phone use is still significantly more expensive than fixed telephony.

Over 90% of mobile services offered are prepaid services, while 10% of subscribers use data services such as MMS and WAP.[23]

A third GSM 900 licence was given to Kazakhtelecom's Mobile Telecom Service subsidiary which plans to offer services in 2007 under the trademark NeoTelecom and expects to gain a minimum of 700,000 subscribers by the end of 2007.[24]

3.10 Satellite Services

Satellite services are particularly important for Kazakhstan due to its low population density and difficult terrain. For example, Kazakhtelecom uses satellite technologies in hard-to-reach rural areas. Kazakhstan launched its own communications satellite (KazSat) in 2006 to bring down the costs of satellite services. Currently, 27 million US$ (22.31 million Euro) per year are spent on the rental of satellite services. A second Kazakh satellite, for commercial use, is also planned.

Only a few geographic areas have their universal service needs provided by satellite, but Kazakhtelecom is increasing the number rural areas covered by universal service through satellite.[25]

Satellite services available include IP uplink/downlink, television and telephony. Both IP uplink/downlink and satellite telephony services are considered to be very expensive by individual customers and there is limited demand for them (an important exception is universal service provided via satellite by Kazakhtelecom to rural areas). Satellite television on the other hand is very widespread in Kazakhstan and is sometimes less expensive than cable television.

For businesses, services available include IP uplink/downlink, telephony, IP connection for resale by ISPs and television. These services are usually in high demand and their prices are relatively low (by business standards).

[21] Agency on Statistics of the Republic of Kazakhstan, 1st half of 2006 report, July 2006

[22] "Science and Innovation Activity in Kazakhstan in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[23] Based on statistics from subscriber data from providers, and data from the Agency on Statistics

[24] According to Press Release by JSC Samruk accessed at http://www.interfax.kz on November 9, 2006

[25] Kazakhtelecom Joint Stock Company Annual Report for 2004, available at http://www.telecom.kz

The only problem reported by satellite service providers relates to restrictions placed on international companies operating in the domestic market place. In order for international satellite companies to provide services in Kazakhstan they need to have both a billing centre and a centre for network management in Kazakhstan.

Thuraya[26] is the only operator of pure satellite telecommunications in Kazakhstan and its market share is very small. There are 3 satellite operators that provide only satellite television services. Other operators use satellite data transmission (including VoIP and other IP services) as part of their telecoms network and it is difficult to approximate the share of data transmitted by satellite.

Costs (and prices) of satellite services are much higher than those of fixed or mobile networks, with the exception of satellite television. The launch of the KazSat satellite should help reduce these.

There is an Association of NRENs in Kazakhstan called KAZRena,[27] which now provides high-speed, low-cost Internet access for education and research institutions in Kazakhstan using satellite technologies. It is funded by a NATO grant.

3.11 Resources of National Regulatory Authorities (NRAs)

The AIC is responsible for all aspects of telecommunications sector regulation except for tariff policy. The Agency on the Regulation of Natural Monopolies (ARNM) is responsible for tariff policy in the telecoms sector. The two agencies are interlinked and coordinate their work. Both agencies are required to report to the Government of Kazakhstan.

Recent changes in government company management introduced in 2006 have transferred the management of Kazakhtelecom from AIC to the newly created Joint Stock Company Kazakhstan's Holding for State Assets Management "Samruk." Although this is a step towards creating a truly independent regulator. The AIC still is neither legally nor functionally independent and cannot be considered to be a wholly independent national regulatory authority, as both AIC and Samruk report to the government of Kazakhstan and Kazakhtelecom remains one of the largest taxpayers in Kazakhstan. Inadequate resources exacerbate this problem. According to market players and some employees of the AIC, limited staff, particularly a lack of qualified specialists and limited financial resources, are the biggest areas of concern.

There are allegedly cases where staff from Kazakhtelecom work for the AIC and for the ARNM. However, these cases have not been verified.

According to the Implementation Plan of the Programme for Telecommunications Sector Development for 2006-2008, there are no plans to establish an independent regulator, although this had been included in the draft version of the plan. The AIC has been advised by the World Bank on the issue of setting the stage for an independent regulator and the World Bank has recommended that the AIC consider the experience of other

[26] http://www.thuraya.com/

[27] http://www.kazrena.kz/

countries, including EU models. The recent dismissal of the third chairman of AIC in three years poses a lot of new questions on the reform of AIC.

The consultation processes of the current regulatory system are not sufficiently transparent to avoid undue lobbying pressure by service operators such as the incumbent. Kazakhtelecom has a considerable degree of lobbying power, which it uses at every opportunity. The AIC undertakes consultation exercises with the National Telecommunications Association (NTA). However, most market players (except for large ones that are part of the NTA) do not believe that the consultations are sufficient.

To illustrate the close relationship between AIC and Kazakhtelecom the following facts can be mentioned:

1. 2005 – Aben Bektasov, (then a Director of Kazakhtelecom becomes Chairman of AIC)
2. 2006 – Khairat Karibzhanov, President of Kazakhtelecom is publicly relieved of his duties by the President of Kazakhstan due to “outrageously high” salary of 365,000 US$ per year with 1.7 million US$ received in bonuses for 2005 alone.
3. 2006 – Askar Zhumagaliev, Chairman of AIC leaves his post to become President of Kazakhtelecom.

There are no specific guidelines set for the AIC with regard to how quickly it needs to deal with disputes. However, it must adhere to general government protocol, which requires that disputes be dealt with in a 30-day period.

When decisions are made by the AIC, the standard reaction of Kazakhtelecom is to appeal, triggering the instigation of the appeals process. At the end of this process, Kazakhtelecom generally accepts the decision and does not take the action any further. This automatic appealing of decisions, however, uses considerable resources of an already under-resourced authority.

3.12 Licensing and Authorisation

Licences are issued by the AIC. In order to provide services, mobile operators, fixed operators and Internet access providers have to hold a valid licence. Exceptions to this rule apply to resellers of services of licence holders as long as they sell the services under the brand of the licence holder. For example, a company can resell Internet traffic under Kazakhtelecom's brand without holding a licence.

3.12.1 Mobile operators:

There is no set licence fee for mobile operators. Licences are awarded on a tender basis with the “best price offer” system. The first two GSM operators paid 67.5 US$ million (55.7 million Euro) for their GSM licences in 1997. There is no information available how much has Kazakhtelecom paid for GSM 900 licence it acquired for Mobile Telecom Service, its subsidiary, in 2006.

3.12.2 Fixed operators:

The licence fee for fixed operators is set at 6 monthly indexes.[28] Currently the licence fee is 6,180 KZT[29] (38 Euro). There are eleven types of communications licence in total – national long distance, international long distance, IP telephony, data transmission services (including Internet and telegraph), leased line services, mobile satellite communications services, mobile communications (including radio, trunking and paging), private network services, postal services and technical services for communications lines and infrastructure.

3.12.3 Internet access providers:

The licence fee for ISPs is set at 6 monthly indexes. Currently the licence fee is 6,180 KZT[30] (38 Euro).

There is a long list of requirements that have to be met in order to be able to obtain a licence. These requirements are listed in Decree of the Government of Kazakhstan 998 On Certain Issues of Licensing in the Sphere of Communications and Government Decree 909 On Approval of the List of Qualification Requirements and Criteria on Selection of International and National Long Distance Communications Operators.[31] The requirements set forth in the decree create a significant barrier for new market entrants.

3.13 Spectrum

The Commission on Radio Frequency Spectrum oversees spectrum management and allocation. The Commission consists of representatives of various Government bodies, including the Agency on Informatisation and Communications (AIC), the Ministry of Defence and the Committee on National Security.

Frequencies are allocated according to the Joint Order of the Chairman of the AIC and the Minister of Defence on approval of the rules on radio frequency spectrum allocation for radio services, and on the allocation of frequency band and radio frequencies (radio frequency channels) for radio electronic purposes for all needs on the territory of the Republic of Kazakhstan.[32]

---

[28] Instead of setting prices in currency for e.g. fines, licence fees, processing fees, etc. the Government developed the idea of a "monthly index", which takes account of currency, interest rates and inflation rates fluctuations. This way, any legal documents will stipulate a fee in a number of monthly indexes, which, in the case of a telecoms licence, is six. The monthly index value is set every year. In other words, this is instead of having to change laws and regulations every time; only the monthly index value has to be amended. This innovation was introduced after 1997-1998 when inflation went up to almost 40%, creating considerable difficulties for the Government, which had to amend all laws and regulations to adjust the amounts for fines and fees.

[29] The monthly index for 2006 is 1030 KZT

[30] The monthly index for 2006 is 1030 KZT

[31] Decree 998 was made on 29 September 2004 and Decree 909 was created on 27 August 2004.

[32] The statements were issued on 15 July 2004 and 30 July 2004 respectively.

In order to receive a number of channels in a certain frequency range for commercial usage, an application has to be submitted to the Commission on Radio Frequency Spectrum. The Commission then decides whether to allocate the spectrum or not. The annual spectrum usage fee is very low (less than 100 Euro). Some frequencies are allocated as a part of a licence for the provision of telecoms services (as is the case with mobile operator licences, for example).

The AIC has indicated that a draft Law on Radio Frequency Spectrum is currently in the works in the first half of 2007.

Radio frequency spectrum in Kazakhstan is divided into three categories – Government/military, civil and shared use. Very limited spectrum range is available for civil use. Some frequencies in 450MHz, 800MHz, 900MHZ, 1.2GHz, 1.8 GHz and 2.4GHz bands are available. Spectrum is readily available for Wi-Fi use.

4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES

4.1 Digital Signatures

The Law on Electronic Documents and Electronic Digital Signatures was considered a priority in Kazakhstan and was adopted on 7 January 2003.

The law foresees a complicated system of certification authorities, which will be dealing with technologies for creating digital signatures. Moreover, the law requires that only the signatures created on the basis of technologies that have been approved by a state standards body will be recognised as having mandatory force. The law suggests a complex system of recognising digital signatures based on cryptography. An exception is made for corporate certification authorities and certification authorities of other countries that can be chosen by businesses or citizens. However, any electronic interaction with the government will require the use of government-approved certification authorities.

The Law on e-signatures covers hardware, software, and other facilities for securing and controlling the efficiency of information security and certifying compliance with information security requirements. However, the standards for such certification are only now being developed.

The majority of central government bodies were assigned digital signatures in 2006, however, most of them are yet to use electronic document circulation systems in their daily activities.

The Ministry of Industry and Trade has indicated that it intended to develop a Law on Electronic Trade in 2006, with adoption in 2007. However, this was not done and it no longer seems to be a priority. It remains unclear what problems with the existing legislation have been identified by the Ministry that this new law intends to solve and why the adaptation of existing legislation has been ruled out as the solution to those problems.

4.2 Payment systems

While e-commerce is comparatively undeveloped in Kazakhstan, the e-banking sector is exceptionally advanced. Most of the 35 banks operating in Kazakhstan have implemented online banking systems for corporate customers (although only 5 have implemented online banking systems for private customers). Online banking systems for corporate customers are very effective, offering the majority of banking services through electronic means (direct dial-in and Internet).[33]

Online banking for individual customers (consumer e-banking) has been available in Kazakhstan for 5 years. Texakabank, [34] Halyk Bank[35] and Kazkommertsbank[36] launched

[33] This information was provided by the major banks of Kazakhstan. No official statistics are currently available

[34] http://www.texakabank.kz/eng/

this service during the summer of 2000, with BTA and ATF banks following suit in 2003. Current revenues from consumer e-banking are believed to be low,[37] except for Halyk Bank's system, which is, apparently, generating profit. According to Halyk Bank, the annual turnover in 2004 for consumer e-banking totalled 93 million Euro, with profit in the region of 313,000 Euro.

All five of these banks offer account access with information on transactions; three banks offer bill payment services; and only two banks offer online bank transfers. Halyk Bank has the most sophisticated e-banking system, with the maximum amount of functions, including online currency conversions for five major currencies.

[35] http://www.halykbank.kz/

[36] http://en.kkb.kz/

[37] Texakabank, Kazkommertsbank, BTA and ATF banks chose not to disclose their revenues from consumer e-banking.

5 USE OF ELECTRONIC COMMUNICATIONS SERVICES

5.1 Fixed Telephony Penetration

Fixed network penetration is currently 17.9%,[38] buoyed by strong competition between seven fixed line service providers. 52% of telephone exchanges in rural areas are now digital while in urban areas this figure is over 77%.[39]

5.2 Mobile Usage

The mobile penetration rate is already quite significant 39.9% and growing very quickly (up from 35.6%[40] at the end of 2005). There is a significant proportion of the country that is not covered by mobile networks, as Kazakhstan has very low population density (5.5 people per km^2).[41] Mobile networks cover all major cities and towns, some rural areas and major highways. Since 55% of the population lives in cities or towns,[42] it can be estimated that at least 60% of the population is covered by mobile networks. There are currently no 3G services available.

According to the results of the survey conducted by COMCON-2 Eurasia[43] in 2004, 35% (approx. 640,000) of urban households (in cities with populations of 70,000 and more) in Kazakhstan have a mobile phone. In two major cities, Almaty and Astana, this number is higher, 55% and 57% respectively. These numbers do not include corporate mobile users.

5.3 Cable Network

According to the publication Expert Kazakhstan, there are over 600,000 paid TV users in Kazakhstan which includes cable and satellite. AlmaTV has the largest cable customer base and controls over 40% of the market. The other 60% are split among over 60 different providers of paid TV services. AlmaTV is planning to start offering digital TV services in 2007.[44]

[38] "Transport and Communications in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[39] Agency on Informatization and Communications, June 2006

[40] "Science and Innovation Activity in Kazakhstan in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[41] These data are from the Agency on Statistics.

[42] These data are from the Agency on Statistics.

[43] http://www.eng.comcon-2.kz/index.php

[44] Expert Kazakhstan, accessed at http://www.expert.ru/printissues/kazakhstan/2006

5.4 Computer Availability

There are currently 5.1 computers per 100 inhabitants.[45] In 2005, there were 444,341 personal computers sold in Kazakhstan, which constitutes a 20% increase from 371,768 sold in 2004 and a 265% increase from the 121,858 sold in 2003.[46] Experts predict market saturation in only 8-10 years.

There were 335 companies that supplied computers in Kazakhstan in 2005.[47] Production of personal computers in Kazakhstan is limited to assembly of computers from imported parts. According to the Agency on Statistics, there were 45,114 personal computers produced in the country in 2005, including Personal Digital Assistants (PDA) and servers.

Computer penetration in the business sector is much higher than among the population in general – 73.9% of businesses reported to have at least one computer in 2005, an almost 10% increase from 2004.[48]

5.5 Internet Access

The majority of Kazakhstan's users connect to the Internet via dial-up connections. According to the Agency for Statistics, 4% of population had access to the Internet in 2005, according to the Agency on Statistics. The ITU puts the Internet penetration rate at 2.7%.[49] At the same time, 51.2% of business reported to have online access in 2005, a 13.9% increase from 2004.[50] The majority of dial-up Internet access services are priced per hour, billed in one-minute increments. Kazakhtelecom is the only provider that offers Internet access through dial-up virtually everywhere in Kazakhstan (as long, obviously, as the potential user has access to a Kazakhtelecom phone line). In 2006 Kazakhstan saw a significant decrease in dial-up internet prices when Kazakhtelecom reduced prices three times in the course of the year to 120 KZT (less than 1 Euro) and 45 KZT (0.27 Euro) for one hour of Internet use during peak and off-peak times respectively. This constitutes a 50% decrease for the peak tariff and 75% decrease for the off-peak tariff. The Government plans to continue decreasing Internet access prices for dial-up services down to 80 KZT (about 0.5 Euro) per hour at peak times in 2007.

A comparison chart for dial-up Internet access is provided below.

Time of access	Provider		
	Ducat[51]	Kazakhtelecom[52]	Nursat[53]

[45] "Science and Innovation Activity in Kazakhstan in 2005", Agency on Statistics of the Republic of Kazakhstan, 2005

[46] Data provided by the Agency on Statistics of the Republic of Kazakhstan

[47] Data provided by the Agency on Statistics of the Republic of Kazakhstan

[48] "Science and Innovation Activity in Kazakhstan in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[49] Data from http://www.internetworldstats.com

[50] "Science and Innovation Activity in Kazakhstan in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[51] Ducat (Arna) Official Website, accessed at http://card.arna.kz

[52] Kazakhtelecom Official Website, accessed at http://www.telecom.kz/index.php?content=tarif/zona_inet. Unusually, the evening rate is higher than the daytime rate

Day	€ 1.54	€ 0.77	€ 0.98
Evening	€ 0.54	€ 1.03	€ 0.85
Night	€ 0.06	€ 0.28	€ 0.68 (€ 0.34 from 2 am – 8am)
Weekend day	€ 0.54	€ 0.77	n/a
Weekend night	€ 0.06	€ 0.28	n/a

Access to the Internet via satellite is currently very expensive for small users in Kazakhstan and only large corporate customers can afford it. No information on prices for satellite Internet access is publicly available. Providers claim that prices are determined on a customer-by-customer basis.

The final option of connecting to the Internet is using ADSL technology. The largest provider of ADSL services is Kazakhtelecom, providing ADSL-based access to the Internet in virtually every city of Kazakhstan (as long as a phone line connected to a conditioned Kazakhtelecom digital exchange is available). There are currently no statistics available on the number of ADSL users in Kazakhstan, but the figure is believed to be around 5,000 users.

A comparison of prices for broadband Internet access is provided in the table below. Three Internet access providers, AlmaTV, Ducat and Kazakhtelecom, are represented. Service plans usually include a certain amount of prepaid traffic for use in a given month; this amount usually varies depending on the connection speed. Unused traffic usually does not carry over to the next month. Service plan prices are given per month.

Broadband Internet Access (price per month)

Provider	Monthly fee at various connection speeds		
	64 kbit/s	128 kbit/s	256 kbit/s
Ducat[54] Including 500Mb of traffic	€ 108.80	€ 112.00	€ 129.60
Ducat Unlimited traffic	€ 440.80	€ 850.40	€ 1,612.80
Kazakhtelecom[55] Including 500Mb of traffic	€ 57.60	€ 24.80	€ 39.20
Kazakhtelecom Unlimited traffic	€ 343.20	€ 33.60[56]	€ 1,236.80
AlmaTV[57] Including 500Mb of traffic	€ 51.20	€ 60.00	€ 72.80

[53] Nursat Official Website, accessed at http://nursat.kz/page.php?page_id=38&lang=1&parent_id=39

[54] Ducat (Arna) Official Website, accessed at http://www.ducat.kz/?lan=ru&id=46

[55] Kazakhtelecom Megaline Portal, accessed at http://www.megaline.kz/index.php?content=tarify/main

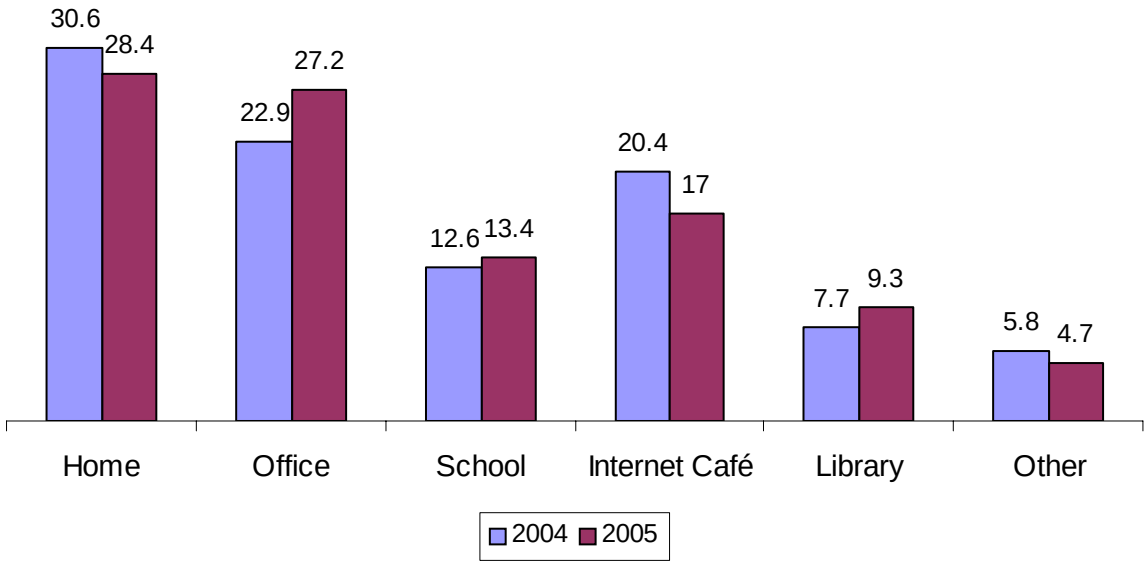
[56] Unlimited access at 128Kbit/s up to 7Gb of traffic per month. Should a user exceed the 7Gb limit, port speed automatically reduces to 32Kbit/sec

AlmaTV Unlimited traffic	€ 428.00	€ 860.00	€ 1,291.20

5.6 Public Internet Access Points

Internet cafés are gaining popularity although they are still few in number and most of them turn into computer game clubs rather than Internet access points. Nevertheless, 17% of users access Internet from Internet cafes according to the Agency on Statistics. The graph below provides Internet access patterns of Kazakhstan's population by point of access.

Internet Access by Point of Access, 2004-2005[58]



The International Research and Exchanges Board[59] has been active in creating PIAPs in a network of towns and cities around Kazakhstan, primarily in libraries. The network currently covers thirteen establishments, providing Internet access, hosting services and technical training.

5.7 Wireless Internet Access

It was originally intended that radio frequency bands in the range of 450-470 MHz, 824-890 MHz and 1850-1990 MHz would be allotted for use in wireless subscribers' radio

[57] AlmaTV Official Website, accessed at http://www.almatv.kz/t_internet.php

[58] "Science and Innovation Activity in Kazakhstan in 2005", Agency on Statistics of the Republic of Kazakhstan, 2006

[59] http://www.irex.org/

access systems (WLL) by the third quarter of 2003. In 2003, the AIC[60] issued licenses to JSC TelecomService and JSC Altel for frequencies in the 824-890 MHZ range. However, the Ministry of Defence failed to allocate frequencies of 1850-1990 MHz, due to their use for military purposes. Limited progress has been made since then.

[60] http://www.aic.gov.kz/en/default.asp

6 AVAILABILITY OF ONLINE SERVICES

6.1 E-Commerce

While e-commerce has not yet taken off in any significant way in Kazakhstan, the banking sector has advanced quite considerably. Moreover, the Kazakh government has made considerable progress towards ensuring that a comprehensive regulatory framework is in place in anticipation of the development of this market.

6.2 E-Government

Kazakhstan's e-Government implementation began with the National Information Infrastructure Development Program, approved by Presidential Decree in March 2001. Since then, Kazakhstan has successfully built the necessary foundation for e-Government and work on implementation is ongoing, focussing primarily on the development of government databases and the Government portal. Among other things, the Development Programme has led to the drafting of the Law on Informatisation and the Law on Electronic Document and Electronic Digital Signature, both of which were adopted in 2003. Most of the implementation for both these laws has already been undertaken. Currently, amendments to the Law on Informatisation are being considered by the Parliament which are aimed at speeding up the implementation of e-government in Kazakhstan.

Since 2001, the following Agency information systems were implemented:

- Integrated internal revenue information system;
- Taxpayer and tax entity registries;
- Automated customs information system; and
- Automated pension (social security) payment system.

Since 2004, the Government developed and approved a comprehensive strategic framework for e-Government, comprising an e-Government Concept Paper, an e-Government Development Programme for 2005-2007 and an e-Government Implementation Action Plan for 2005-2007.

According to the e-Government Development Programme (2005-2007), the implementation of e-Government in Kazakhstan will consist of the following three phases:

- Phase I focuses on the development of e-Government infrastructure, which implies making available such e-Government components as a portal, payment clearance gateway allowing interfacing with bank systems, national unified identification system, unified transport medium for Government agencies, inter-agency and standard intra-agency systems for national and sub-national Governments, providing access to e-services, bridging the digital divide and

reducing computer illiteracy. This phase will see a number of online and interactive services offered.

- Phase II envisages the development of e-Government services which would satisfy the many needs of the public and businesses. Interactive services will be offered during this phase.
- Phase III will see the emergence of an information society in Kazakhstan, which will transform all facets of public activities. Under the broader effort, numerous services will be pursued, such as e-health, e-education, e-culture and e-democracy.[61]

The institutional framework for e-government has evolved substantially since 2001, but still requires adjustments based on the performance to date. A high-level coordination body, the Commission on Informatisation, was formed within the Prime Minister's office, and includes the Deputy Prime Minister and various Ministers and Heads of Agencies. The body has so far not proven to be widely effective. Kazakhstan still requires an effective Chief Information Officer (CIO).

The AIC is the government body responsible for implementation of the programme. The AIC is responsible for initiation of programme activities, coordination with all Government ministries and agencies, and overall integration of the e-Government efforts across the different levels of Government. This last point is difficult to achieve as the Head of the AIC is essentially a Minister and, as a result, the AIC has little authority over other ministries and agencies. The AIC also appears to be seriously understaffed for its responsibilities in the implementation of e-Government.

For the e-Government Implementation Action Plan, the AIC receives technical support from National Information Technologies (NIT), a 100% Government-owned company, which has been designated as the National IT Operator. NIT was established to implement the National Information Infrastructure Development programme, and is in charge of the development of e-Government infrastructure and the technical integration of Government IT systems. After approval of the e-Government Development Programme in 2004, NIT became responsible for certain aspects in accordance with the e-Government Implementation Action Plan. For this purpose, NIT is staffed with many professional IT experts and is responsible for international best-practice research, systems study, proposal evaluation, and IT project management support for e-Government projects. Software development efforts are outsourced to the private sector under the overall supervision and project management of NIT staff. Due to understaffing of the AIC, many of its responsibilities are now being handled by NIT.

The following is a short list of Government sectors with major e-Government projects planned for implementation by the end of 2007, according to the e-Government Development Programme Annex.[62] There are a total of 87 different individual initiatives in the full list.

- Tax and customs obligations
- Entrepreneurship and business
- Social protection and employment

[61] Kazakhstan e-Government Program, available at http://www.aic.gov.kz

[62] Annex to the National E-Government Development Programme in the Republic of Kazakhstan for 2005 – 2007 approved by the Decree of the President of the Republic of Kazakhstan of 10 November 2004 No.1471

- Education, science and health care
- Law enforcement
- Economy and trade
- Defence, national security and management
- Environment protection
- Culture, sports and tourism
- Diplomacy and international relations

Some Government agencies already provide interactive services outlined in the list of services above, with a certain degree of success. For example, it is already possible to submit tax-return forms electronically and to check whether tax payments have cleared the system or whether there are any tax liabilities outstanding. All of this is done in real time using digital signatures, which sets Kazakhstan apart from other CIS countries. It is reported that over 60% of businesses in Kazakhstan submit their tax reports electronically.

A majority of government ministries and agencies now have web presence, with some websites being extremely popular. For example, the website for the Committee of Financial Control and State Procurement under the Ministry of Finance is ranked number seven in the number of daily visits out of all websites in Kazakhstan. Most government websites are only informational and do not provide any interactive services as yet. There are some websites that are only there for the sake of being online, ones that are quite outdated and/or of little use to businesses or the general public. However, an electronic public procurement system has been created and is due to be launched shortly.

6.3 E-Health

Telemedicine is at an early stage of development in Kazakhstan. However, the government has identified this as an important issue for the country and the equivalent of over one million Euro has been invested in the development of a new national system.

6.4 ICT Connectivity in Schools

CNews Analytics[63] states that there is an average of 54 students per one computer in primary schools. Only 44% of primary schools are connected to the Internet. In professional schools and colleges there are 31 and 25 students per one computer, respectively. 39% of professional schools are connected to the Internet; for colleges this number reaches 51%.

Only 25-30% of students in Almaty have home computers and only 10-15% of those have access to the Internet from home, according to CNews Analytics research.

[63] http://www.cnews.ru

According to data provided by Actis Systems Asia[64] in 2003, students comprised only 9.4% of Internet users in Kazakhstan.

As of December 1, 2005 85.8% of schools received telephone connections (6760 out of 7880 total). Rural school telephone penetration reached 82.7% with 4986 out 6030 schools connected to the telephone network. Internet connectivity in schools is 82.2% total and 80.1% in rural areas. In July 2005, 77% of Kazakhstan's schools had telephones (6,121 out of a total of 7,915) and only 60% were connected to the Internet. It is expected that by the end of 2006 all of schools in Kazakhstan will have telephones and Internet connectivity at schools will reach near 100%.

The Scientific Committee of NATO decided to continue technical support to the KazRENA association with the aim of developing distance learning in Kazakhstan. This was announced during a press-conference in Almaty on 28 October 2005. NATO has provided technical support to the Network Operations Centre of KazRENA since 2003. KazRENA provides programme development as well as Internet connectivity via satellite to universities in Kazakhstan. Currently, 12 universities in Kazakhstan are working with KazRENA and providing distance learning programmes.[65]

[64] A web design, hosting and consulting company

[65] Source: Kazakhstan Today News Agency, accessed at http://www.gazeta.kz

7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY

7.1 Fixed Line Market

Kazakhtelecom[66] is the largest telecoms operator in Kazakhstan and controls about 50% of the telecommunications market. The majority of Kazakhtelecom's shares are owned by the Kazakhstan Government. The ownership structure of Kazakhtelecom is as follows: just over 50% of shares are owned by the federal Government in the form of Samruk Holding, with the bulk of the other 50% being owned by holding companies and banks, and the remainder owned by minority shareholders.[67]

The other 6 major telecoms operators are Transtelecom,[68] KazTransCom,[69] Arna,[70] Nursat,[71] Astel[72] and TNS Plus. There are also 62 providers of data transmission and internet services.

Transtelecom is a subsidiary of Kazakhstan Temir Zholy, the national railroad company, which is 100% Government owned. KazTransCom is a subsidiary of KazMunaiGas, a national oil and gas company, which is also 100% Government owned. In other words, both companies are indirectly owned by the Government. Nursat was a private company, until Kazakhtelecom acquired 41.25% of its shares in 2002, and in 2006 Kazakhtelecom announced its plans to acquire the remaining shares in the company. There is no information if the transaction has gone through.[73] Only Arna, Astel and TNS Plus remain free of Government ownership.

Additionally, Kazakhtelecom owns a 49% stake in GSM Kazakhstan, the largest mobile operator and 100% of the shares in Altel, another mobile operator.

Currently, Kazakhstan's legislation prohibits foreign businesses or individuals owning more than 49% of fixed line telecommunications companies that are licensed to provide national or international long- distance services. Arna, a private company, was 51.25% foreign-owned in 2003. In 2004, the foreign ownership in the company decreased to 47.50% in order for the company to keep its licence for national and international long-distance services.

Kazakhtelecom has developed over eleven thousand kilometres of fibre-optic network, connecting fourteen larger cities as well as 116 smaller towns and cities as part of the National Information Super Highway (NISH) project. The full completion of the project is

[66] http://www.telecom.kz/index_eng.php

[67] This information comes from the Kazakhtelecom Joint Stock Company Annual Report for 2004, which is available at http://www.telecom.kz. The report does not mention the exact amounts owned by the Central Asian Industrial Holdings N.V. and the minority shareholders. The report also does not name the minority shareholders.

[68] http://www.transtelecom.kz/index.php?item=142&lang=2

[69] http://www.kaztranscom.kz/

[70] http://www.arna.kz/

[71] http://www.nursat.kz/

[72] http://www.astel.kz/english/index.php?p=about

[73] This information can be found in the Kazakhtelecom Joint Stock Company Annual Report for 2004.

expected in 2007 with the connection of Aktobe and Uralsk to the main ring via fibre-optic lines. In 2006 Kazakhtelecom stated that the total capacity of its international connectivity was 665 Mbps. According to Kazakhtelecom the connections available are as follows:

- Almaty – Hong Kong, 155 Mbps
- Almaty – Moscow, 310 Mbps
- Astana – Frankfurt, 100 Mbps
- Astana – Moscow, 100 Mbps

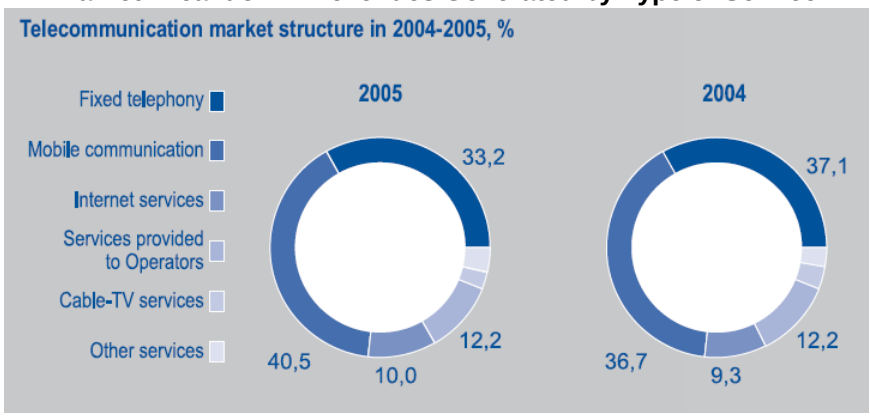
7.2 Mobile Market

The cap on foreign investment (as mentioned above) has prevented foreign owned companies from acquiring licences for long distance services. This requirement will also prevent both GSM operators, GSM Kazakhstan[74] (51% owned by a Fintur holding) and Kartel[75] (over 50% owned by Russia's Vimpelcom) from acquiring such licences. As a result, both companies currently provide long distance services through Kazakhtelecom.

According to the AIC, the 49% restriction on foreign ownership is a temporary measure, which was supposed to be abolished in 2006 but currently remains in effect. This measure was put in force in order to accelerate the development of Kazakhstan's telecoms companies after Kazakhtelecom's exclusive rights on the provision of long-distance services were suspended and to better prepare Kazakhstan for accession to the WTO, as competition from foreign companies is likely to increase dramatically.

7.3 Communications Market Overview

Market Breakdown: Revenues Generated by Type of Service[76]

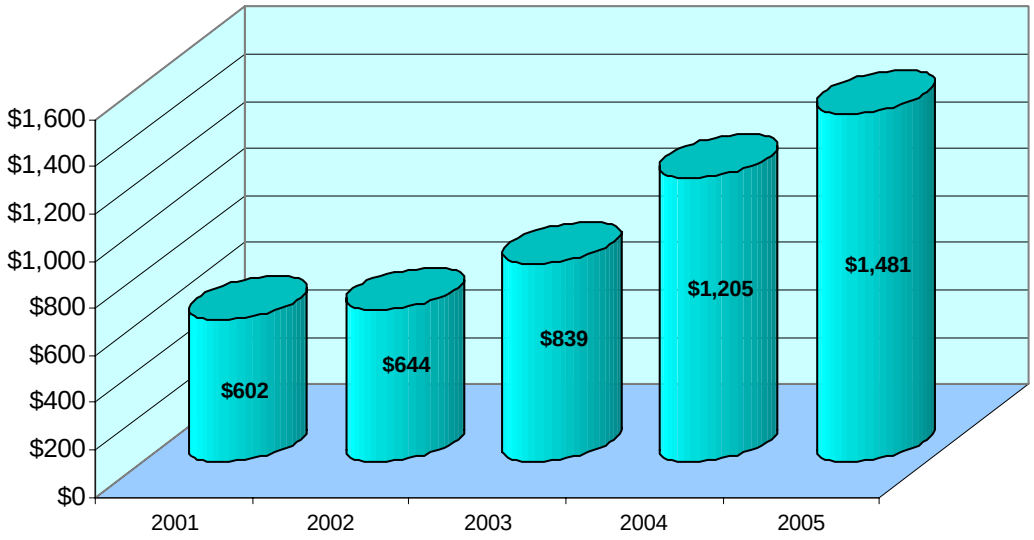


[74] http://www.kcell.kz/en/

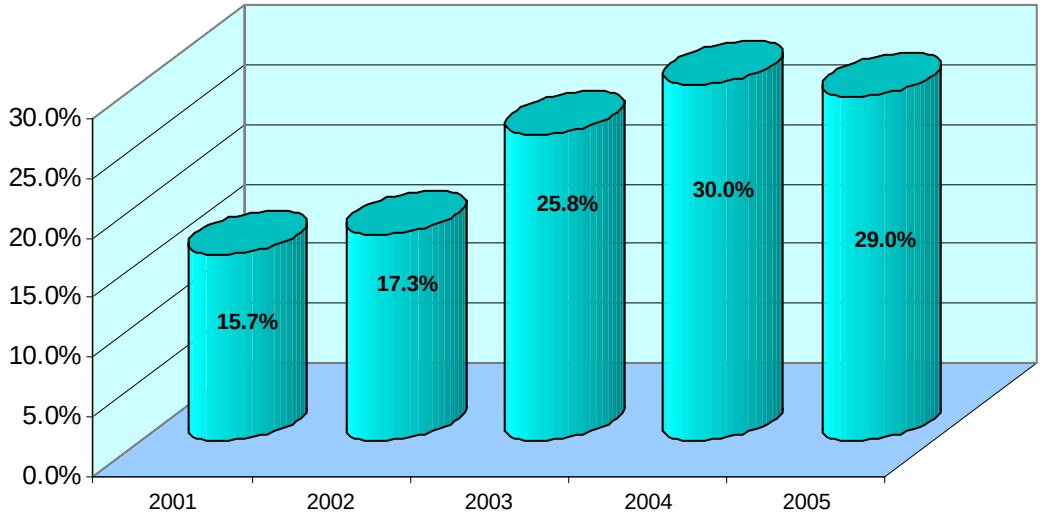
[75] http://www.k-mobile.kz

[76] Kazakhtelecom Annual Report for 2005.

Annual communications market revenues 2001-2005, millions USD[77]



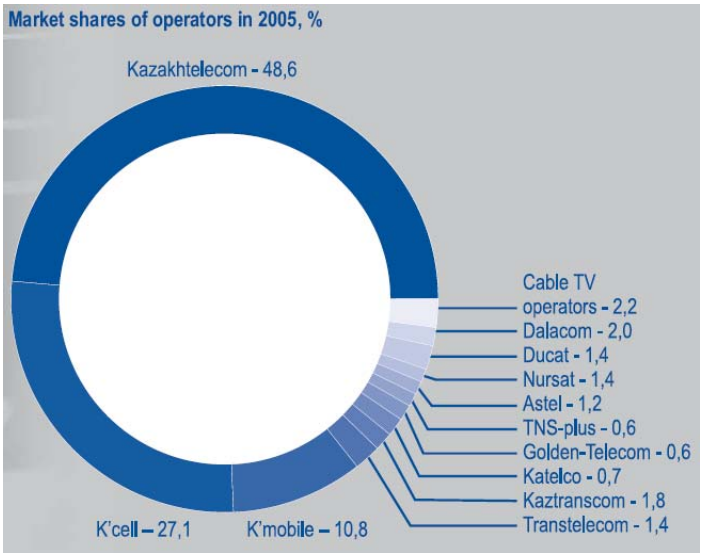
Annual communications market growth rates 2001-2005[78]



[77] Data provided by the Agency on Statistics of the Republic of Kazakhstan

[78] Data provided by the Agency on Statistics of the Republic of Kazakhstan

Market shares of telecom operators in 2005[79].



7.4 Ownership Structure of the Wider ICT Industry

There are limited statistics available on the wider IT industry in Kazakhstan.

There were 335 companies that supplied computers in Kazakhstan in 2005.[80] The number of computer suppliers has been growing steadily from 263 in 2004 and 201 in 2003. Most of these companies are small businesses. However, there are a few large players; some have been on the market for over 10 years. There are estimated to be a total of over 500 companies in the IT sector. The vast majority of IT companies in Kazakhstan are privately owned.

Foreign IT companies have gained solid positions in Kazakhstan's market. Large international companies, which are well represented in Kazakhstan, include Ericsson, Alcatel, Nokia, Siemens, Huawei, ZyXEL, ZTE, Microsoft, SAP, Intel, Oracle and Hewlett Packard.

Clients of foreign companies include Kazakhstan companies and citizens, foreign businesses and government entities. Annual revenues of foreign companies are rapidly increasing. For example, Microsoft have near doubled its sales in Kazakhstan in year 2005 and showed a 47% increase in 2006, while Oracle has seen a steady growth of about 40% in the last 3 years and expects to keep this growth rate. Both companies have showed even higher growth rates in the small and medium business segment for 2004 – Oracle, 60%[81] and Microsoft, 92%[82]. Intel's turnover was up 128% in 2004 from 2003. IBM opened a representative office in Kazakhstan in November, 2005.

[79] Kazakhtelecom Annual Report for 2005

[80] Data provided by the Agency on Statistics of the Republic of Kazakhstan

[81] "Oracle conquers the market", Expert Kazakhstan, #7(33), April 11, 2005

[82] Microsoft Press Releases, accessed http://www.microsoft.com/kazakhstan

Political Intelligence

INTERNEWS

Moldova

Local Expert: Ion Cosuleanu

Table of contents

1 OVERVIEW 4
1.1 Regulation of Electronic Communications 4
1.2 Regulation of Electronic Services 5
1.3 Use of Information and Communication Technologies 6
2 GENERAL ENVIRONMENT 7
2.1 Influence of stakeholders on regulation and policy 7
2.2 National Development Plan 8
2.3 Data Protection 9
2.4 Cybercrime and Spam 10
3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS 12
3.1 Interconnection 12
3.2 Numbering 15
3.3 Rights of Way and Facilities Sharing/Collocation 16
3.4 Tariff Policy 17
3.5 Cost Accounting 18
3.6 Universal Service 19
3.7 Local Loop Unbundling 19
3.8 Leased Lines 20
3.9 Mobile Services 21
3.10 Satellite Services 23
3.11 Status of the National Regulatory Authority (NRA) 24
3.12 Licensing and Authorisation 26
3.13 Spectrum 29
4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES 31
4.1 Digital Signatures 31
4.2 Payment Systems 32
5 USE OF ELECTRONIC COMMUNICATIONS SERVICES 33
5.1 Fixed Telephony Penetration 33
5.2 Mobile Usage 34
5.3 Cable Services 35
5.4 Computer Availability 35
5.5 Internet Access 36
5.6 Public Internet Access Points 38

5.7 Wireless Internet Access 38
6 AVAILABILITY OF ONLINE SERVICES 39
6.1 E-Commerce 40
6.2 E-Government 41
6.3 E-Health 44
6.4 E-Learning 45
7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY 47
7.1 Fixed Networks 48
7.2 Mobile Networks 49
7.3 Cable Networks 49
7.4 Internet Access Providers 50
7.5 Satellite Operators 50
7.6 Production of IT Services 50
7.7 Financial Development of the ICT Sector 51

1 OVERVIEW

The current independent state of Moldova was established in 1991. It has a population of 4.3 million people with a land mass of 33,800 square kilometres. The GNI per capita was 587 Euro in 2005, based on World Bank figures. Moldova is a parliamentary republic. The country consists of 32 districts, 3 municipalities and 2 semi-autonomous regions, one of which is the breakaway region of Transdniestria.

Efforts to build an effective information society in Moldova are built on numerous documents prepared in the last few years. These include the Declaration of Intent among the member states of Stability Pact for South- Eastern Europe of 2002 (which had a significant information society aspect) and the March 19, 2004, Presidential Decree no. 1743-III directing the Government to begin the process of preparing a National Strategy on Information Society Technologies for Development (ISTD). On June 8, 2004, the Government established the guiding principles for its National Strategy issuing Official Decision no. 632 on "Policies for building an information society in the Republic of Moldova." A National Committee on Building an Information Society has been created as a multi/stakeholder mechanism to monitor the implementation of related policies. Later in the same year a package of fiscal and other reforms aimed at ICT companies was approved by Parliament.

Further e-development measures are included in the EGPRSP,[1] the National e-Strategy, the EU-Moldova Action Plan and the e-Governance Concept. The National Strategy for Building of Information Society (2005-2010) was approved by the Government in March 2005.[2] More recently, measures to improve egovernance (in particular the "Building eGovernance in Moldova" project), bolstered by improvements in e-signature legislation, have been adopted. In addition, the Regulation on the Realisation Mechanism for the "Electronic Moldova" Action Plan was adopted in January 2006, as a framework for future development of the information society in Moldova.

1.1 Regulation of Electronic Communications

Moldova has comprehensive legislation in the electronic communications sector, overseen by the National Regulatory Authority (ANRTI).

Interconnection regulation is considered complete and in line with European legislation. The Interconnection Regulation also forms a basis for requiring LLU, although implementation has proven problematic.

Numbering is also governed by the NRA, with freephone, VoIP and SMS short codes all available.

[1] Economic Growth and Poverty Reduction Strategy Paper

[2] Government Decision nr.255 of March 9 2005, Monitorul Oficial nr. 46-50/336 of March 25 2005.

Legal requirements for non-discrimination are in place, although reports have been made about difficulties regarding the building of infrastructure and facilities sharing. ANRTI is currently addressing these concerns.

Tariff rebalancing has been completed for almost all sections of the market. Universal service needs are being addressed through legislation and pilot projects for public access in rural areas.

Leased lines are generally available nationwide, although there are problems with cost accounting. These problems should be addressed once more comprehensive rules on cost accounting are introduced. It is planned that cost accounting, based on long-run average incremental costs (LRAIC), is to be implemented in the course of 2007 after the adoption of the new Electronic Communications Law.

Legislation is in place on data protection, although there is no oversight body (although a body with some data protection powers is planned) and limited rules on the international transfer of personal data.

1.2 Regulation of Electronic Services

Moldova has a very comprehensive set of legislation on electronic services, which is generally in line with that of the European Union. The 2004 Law on E-Commerce and the 2004 Law on Electronic Documents and Electronic Signatures provide a firm basis for e-signatures.

ISPs are not obliged to actively monitor networks for potentially illegal activity. No major concerns have been cited by international organisations with regards to gaps in Moldovan legislation relating to online child abuse images or IPR legislation.

The general framework for online payments appears to be in place in Moldova, although low Internet penetration and purchasing power mean that online service provision has not yet reached its full potential.

E-government services are at an early stage of development. Government websites have a low level of interactivity. For example, tax forms may be downloaded from the Internet but cannot be submitted electronically for official purposes.

In October 2006, the Ministry of Economy and Trade initiated the development of a new normative act on electronic commerce to improve the legislative framework in the sector.

In order to help support the sector, software producers will be exempted from the payment of VAT for a period of five years through a simplified exemption procedure. The new measures will also reduce the bureaucracy surrounding the procedure for allocation of work permits for invited foreign software specialists as well as the procedure of recognition of foreign diplomas in Moldova.[3]

[3] 06.10.2006 - [DECA-press]

1.3 Use of Information and Communication Technologies

Competition has only recently been introduced to the fixed line market (where the penetration rate is at 28 percent[4]); whilst a high degree of competition has been a fixture of the mobile market for a number of years (the mobile penetration rate is 35.2 percent[5]). Figures collated in 2005 indicated that there were 10.27[6] computers per one hundred Moldovan inhabitants. This comparatively low level is unsurprising when one considers that a 420 Euro computer would cost 42 percent of the average annual wage.[7] However, 28.9 percent of the population have access to computers either at home, in their place of study, or at work, with 16 percent of the population regularly using the Internet.[8] Development of the use of ICT is broadly in line with the targets set by the government in the e-Moldova action plan.[9]

The provision of electronic services is developing slowly. Utilities companies have introduced remote payment via bank ATM machines, which should help consumers become more familiar with the concept of electronic payments.

An e-money system has recently been launched in Moldova, permitting low-cost online payments for goods and services (1-6 MDL (6 eurocents to 39 eurocents) for transactions up to 10,000 MDL (644 Euro). To avail of this service, individuals register at the site www.emoney.md, open an electronic account and make a bank transfer to the e-money service provider (Emoney-Prim Company) or add money to their account at a branch of Moliasbank, which is participating as a partner in the scheme. The organisers of the project expect to have 40,000 users by the end of the first year of operation.

[4] Data from ANRTI

[5] Data from ANRTI

[6] http://www.mdi.gov.md/stat10_md/stat10_3_md/

[7] Based on average wages in the period January-October 2005. Data from the National Bureau of Statistics of the Republic of Moldova

[8] Data from the Moldova e-Readiness Report 2004

[9] See http://www.mdi.gov.md/img/mejsotr/ActionPlanEUMeng.pdf , P 26 (last visited 15 March 2005)

2 GENERAL ENVIRONMENT

2.1 Influence of stakeholders on regulation and policy

The Union of the Communications Sector of Moldova has existed for some time. This organisation is powerful and has Moldtelecom, Radiocomunicatii, the Moldovan Postal Service (Posta Moldovei), the Inspectorate for Communications and private companies as members. The association is mainly oriented towards solving social problems for its members and is less concerned with promoting the industry's wider common interests. Only once, when the privatisation of Moldtelecom started, were any concerns addressed to the Government in relation to regulation of the communications sector.

Internet café owners have also attempted to organise themselves in an Internet Club Association to promote their interests and to fight against what they perceive to be excessive state control.

The new entrants in the telecommunications market organised themselves into a formal trade association: the Association of Patronage of Telecommunications and Informatics, APOTIM.[10] APOTIM consisted (it has never officially been closed, but is de facto no longer in existence) mainly of Internet Service Providers and VoIP providers. In the early stages of their activity, they tried to achieve targets such as non-discrimination and antidumping legislation by exerting vigorous pressure on the Government and ANRTI staff. For example, VoIP service providers in APOTIM (Mega-Dat S.R.L.,[11] Gill International, Arax-Impex,[12] Relsoft Communications[13] and Meganet[14]) addressed a complaint in August 2001 to ANRTI regarding an alleged violation by Moldtelecom of the legislation in force.

In 2004, ANRTI revoked the licence of Mega-dat.com, then the largest ISP in Moldova and a key APOTIM member, for licence condition violation. APOTIM has not played an active role since then.

The former Ministry of Transport and Communications, as a counterbalance to APOTIM and other possible private operators' organisations, has obliged all state-owned operators to organise themselves into a formal trade organisation - the National Confederation of Employees of Moldova. However, this organisation has yet to play a role in campaigning on any specific issue.

The Confederation's managers are nominated by the Minister, by the Board chaired by the Minister and ministry staff members. Therefore, they cannot feasibly fight against or express opposition to Ministry policy.

[10] http://www.apotim.md/md/

[11] http://www.megadat.com/en/

[12] http://www.araxinfo.com/

[13] http://www.relsoft.md/

[14] http://www.meganet.md/

In conclusion, Moldovan trade associations have not played any significant role in the regulatory process in the last 2-3 years.

At the ITU Seminar "European Regional Seminar Telecommunication Liberalization – Challenges and Opportunities for the CEE, CIS and Baltic States", held in Chisinau (Moldova), 20-22 June 2006, the intention to create a new association was expressed by private sector representatives. The new "Association of Private Operators" has since been established and was registered by the Registration Chamber in July 2006 to promote private companies' interests in negotiations with policy making bodies and the NRA on economic, technical and legal issues, promoting development of fair competition, participation in development of the legal and regulatory framework for the electronic communications sector and attracting investment in the development of new services. Among founders of the Association are the main private companies from the sector such as Sun Communication, Telemedia Group, Arax-Impex, Isabel, Sicres, Riscom and Telcom Technologies.

The Association submitted a proposal to the appropriate Parliamentary Committee regarding the new draft of Electronic Communications Law recently approved by the Government.

The Association proposes abolishing licensing obligations for communications services which do not require use of limited resources. It also argues for reform of the procedures for appointing individuals to the most senior roles in ANRTI in order to maximise transparency and competition.

2.2 National Development Plan

The Moldovan government published a National Strategy on Information Society Development (E-Moldova) in March 2005.[15] The Strategy covers a wide range of issues, both with regard to infrastructure development and the provision of government services.

The Strategy is divided into two broad categories: the legislative and procedural framework and the institutional and regulatory framework. These categories are sub-divided into short, medium and long–term tasks. In the short-term the Moldovan authorities have set the following goals:

- Privatisation of major state communications enterprises;
- Improving the attractiveness of the market for investors;
- Development of the law on Electronic Communication to bring it increasingly into line with the EU regulatory framework;
- Improving the monitoring of quality of service, including the establishment of certification centres;
- Creation of a Universal Service fund and roll-out of services to at least 40 percent of localities;
- Creation of a national data transfer network capable of supporting key targets for communications (28 percent penetration for fixed telephony, 30 percent mobile telephony penetration, 10 percent of households with Internet access);
- Implementation of transitional mobile services en route to the rollout of 3G;

[15] Available from http://gov.md/content/en/0000051.pdf.

- Launching of a Moldovan digital satellite TV service.

In the medium term (up to 2008-2010), the aim is to:

- Move towards next generation ICT networks;
- Achieve EU average figures for fixed and mobile telephone use, household Internet use and universal service;
- To launch terrestrial digital TV.

In the long term (post-2010), the aim is to continue developments to match EU ICT levels.

The Moldovan authorities also intend to continue expanding their e-Government programme, enhancing the legislative and procedural framework, the technological framework and the institutional framework.

The National Strategy also supports e-business, e-education, e-science, e-culture, e-science and e-health.

Two observations can be made regarding the implementation of the National Strategy: it appears that some of the targets have either been met already or will probably be met (such as mobile penetration and rollout of new mobile services); on the other hand, it seems that the privatisation of state-owned communications companies is somewhat less of a priority now than it was when the National Strategy was first prepared.

In January 2006, the government adopted a Regulation on the implementation of the Electronic Moldova Action Plan covering mechanisms for the approval and financing of projects and the development of annual sectoral plans for local authorities.

The eGovernance Concept (developed with UNDP support) was approved by the Government in June 2006.[16] The Concept's main objective is to ensure access to official information, provision of services for citizens and business by electronic means, improving the quality of public services, raising the level of participation in the governance process, improving public administration and strengthening democracy and state institutions.

According to the Concept, the Centre for Electronic Governance was supposed to be established by the end of 2006. This will be responsible for coordination of all technical and technological implementation activities. Implementation will be performed based on annual plans developed by central and local public authorities coordinated by the Ministry of Information Development. Based on the central and local public authorities' proposals, the Ministry of Information Development will develop the annual financial plan for implementation of e-Governance.

2.3 Data Protection

Moldova is working towards ratification of the Council of Europe Convention on the Protection of Individuals with Regard to the Automated Processing of Personal Data. There

[16] Government Decision nr. 733 din 28.06.2006, Monitorul Oficial nr. 106-111/799 din 14.07.2006

is currently no special law in force on personal data protection or legislation broadly similar to the EU legal framework.

Data protection requirements are spread over a variety of Moldovan legislative instruments including the Constitution, the Law on Telecommunications (2001), the Law on Access to Information (2000) and the Law on Informatics (2000). The cross-border flow of data (data subject to automated processing, or those collected with the purpose of such processing) is allowed on condition that it does not infringe upon the private rights, freedoms and the duties of citizens, and does not affect the secrecy and confidentiality of the information.

The Law on Informatics requires that information products permit adequate consumer privacy. However, the study team has not been able to identify enforcement mechanisms to ensure that these rules are respected. According to the Law on Informatics, persons working with information systems and networks must ensure data security: no unauthorised access and connection to information systems and networks is allowed.

As in EU legislation, the Law on Informatics creates a category of sensitive data has also been created, where stricter rules apply.

In short, Moldovan legislation covers a great many of the provisions of EU data protection legislation, with the most notable absence being an independent national data protection authority and, therefore, enforcement of these provisions. The new draft Law on On Personal Data Processing was approved by the Government in 2005[17] is now being debated in Parliament, where it has passed its first reading. It is on schedule to be adopted in early January, at the latest.

According to the draft Law, a new body called the Centre for Human Rights Protection, will to be established with the basic functions of a supervisory authority. Parliament rejected the original proposal of having a body solely devoted to data protection.

The draft law was reviewed by the Council of Europe and received positive feedback, although with reservations concerning.the scope of the law and the independence of the (originally proposed) National Centre of Personal Data Protection. The Council of Europe also proposed amendments to a wide range of the provisions in the current draft.[18]

2.4 Cybercrime and Spam

Moldova has signed but not ratified the Council of Europe Cybercrime Convention and the Optional Protocol to the Convention on the Rights of the Child on the Sale of Children, Child Prostitution and Child Pornography.

The Administrative Violations Code (2001) contains provisions concerning the protection of "social morals." According to Article 171(4), the preparation, import, distribution or advertising of pornographic works, printing materials, pictures, or any other objects of

[17] http://www.parlament.md/lawprocess/drafts/2005/

[18] Council of Europe Document : PCRED/DGI/EXP(2006)38, Strasbourg, 17 August 2006 "Appraisal on the Draft Law on Personal Data Processing of the republic of Moldova"

pornographic nature, and the selling or storing with the purpose of selling is to be punished with various fines depending on whether the person is a private citizen or public official.

Government Decision 1400 of 17 December 2001 created the State Agency for the Protection of Morality to work together with the Ministry of Culture for the purpose of removing pornography, sadism and violence in works of literature and art, as well as in the media.

Possibly due to the comparatively low level of Internet penetration in Moldova, the focus of anti-piracy action in Moldova has been on physical media. IFPI claimed in 2004 that the level of music piracy in Moldova was at 69 percent.[19]

With regard to spam, Article 17 of the 2004 Law on Electronic Commerce prohibits the sending of commercial communications via electronic mail without prior consent.[20]

[19] International Intellectual Property Alliance, 2004 Special Report, Moldova.

[20] Law on electronic commerce nr.284-xv of 22.07.2004 monitorul oficial nr.138-146/741 of 13.08.2004

3 REGULATORY ENVIRONMENT FOR ELECTRONIC COMMUNICATIONS

A new draft Law on Electronic Communications to update the 1995 (amended in 2001) Telecommunications Law was discussed in the Government and submitted to the Parliament for approval.[21] The draft Law on Electronic Communications has attracting a wide range of criticism from operators. The Association of Private Operators recently addressed[22] its concerns to the Parliamentary Committee for Budget and Finance expressing the view that the draft would result in the competitive situation in the country deteriorating. One of the key concerns is the reduction in the powers of the NRA proposed by the current draft, in particular due to the continuation of dependence of ANRTI on the Government,

The following are thee main concerns expressed by the Association of Private Operators regarding new Law:

1. Licensing regime. The Law does not alter the current rules on licensing and does not expand the range of services requiring only authorisations.
2. ANRTI independence from the Government:

a) Nomination of ANRTI Board. The new draft stipulates nomination of the Board of directors by the Government, thereby making it heavily dependent on the Government
b) Annual budget approval by the Government
c) ANTRI must consult with SMP operators and government before tariffs are approved. The Association believes that this creates undue barriers to the development of a rebalanced, competitive market.

The Association and other new entrants in the market are also concerned with some definitions in the draft law and suggested reverting to those contained in the EU communications framework.

ANRTI has its own concerns about the new Law, in particular the proposal that the power for SMP designation would be given to the National Competition Authority. This, ANRTI believes, would make it practically impossible to insure fair competition. This has prompted ANRTI to prepare an alternative draft legislative package which was partially taken into consideration by the Government. In the revised Government proposal, SMP designation is to be within ANRTI's remit.

Meanwhile, competitive operators complain that ANRTI is not energetic enough in defending their interests under existing legislation.

3.1 Interconnection

Interconnection in Moldova is regulated by the Regulation on Interconnection (2002). The Regulation was developed in accordance with the Telecommunications Law and other applicable laws, taking into account the National Policy on Telecommunications (2001), the

[21] http://www.parlament.md/lawprocess/drafts/

[22] Source: Association of Private Operators

definitive list of basic telecommunications services, and the Reference Paper from the Republic of Moldova on the schedule of specific commitments (GATS/SC/134, 01-6451) within the Protocol of Accession of the Republic of Moldova to the World Trade Organisation.

The Regulation on Interconnection establishes:

- The rules and principles of network interconnection aimed at ensuring the interoperability of telecommunications and data networks and services offered through these networks, promoting competition between networks and services, and contributing to the development of new services in order to provide wide customer access to services;
- Rights and obligations of operators of public networks and services when establishing interconnection, and offering and obtaining access to the physical infrastructure; and
- Rights and obligations of the ANRTI (the NRA) in interconnection and access regulation.

The Regulation states that interconnection and access must be made available in an open, transparent and non-discriminatory manner, in order to:

- Implement the Telecommunications Law (last updated 2001);
- Encourage investment in telecommunications and data infrastructure to achieve the objectives of the National Policy on Telecommunications and the National Strategy on Information Society Development;
- Ensure the fulfilment of obligations by operators of public networks and services provided in the licence terms;
- Increase the efficiency of competition and the level of market development;
- Increase the efficiency of existing telecommunication facilities;
- Ensure access of subscribers of one network to the subscribers of another network at a reasonable cost and acceptable quality of service;
- Acknowledge that the business objectives of dominant operators are different from those of the new entrants; and
- Account for the convergence of service technologies that remove the traditional boundaries of market segments.

ANRTI's approach to interconnection is to permit free negotiation as much as possible and to intervene only in critical cases according to the available procedures.

The incumbent operator is required by the Interconnection Regulation to publish[23] a Reference Interconnection Offer (RIO) every year by December 31 (after acceptance by ANRTI). The first RIO was published in 2003. Up until 2006, the regulator always accepted the offer, after revision. However, the regulator has received significant complaints from other operators regarding the offer, especially relating to costs and the very long procedures for establishment of the interconnection. The most recent (2006) RIO has not been accepted by ANRTI, due to the lack of legal provisions governing SMP designation. Two alternative providers have told the study team that they have returned numbering resources to ANRTI as the competitive situation has been worsened by the new RIO to the extent that they no longer feel they will be able to use them. They feel that a perceived lack of political support

[23] http://www.anrti.md/en/Interconectare/ORI_2005.pdf

for ANRTI, together with the uncertain regulatory situation and the fact that the competition authority has not been established yet, together with the RIO problems make growth and investment difficult for them.

Call termination rates in Moldova

Type of call	Cost (US$)	Cost (Euro)
fixed to mobile	0.07	0.058
mobile to fixed	0.0319	0.0264 Euro
mobile to mobile:	0.07	0.058
international to Moldtelecom	0.09	0.073

Source: ANRTI

A wholesale price ceiling is fixed by ANRTI for settlements involving Moldtelecom and another fixed operator: rates charged by the incumbent are to be no more than 50 percent of their "Standard"[24] consumer pricing package.

Carrier pre-selection is not yet available and there are no clear plans or timescales for its implementation.

Moldtelecom still has a de facto monopoly on fixed services, although its legal monopoly has been ended and licences for fixed long distance/international services are available at a cost of one million US dollars (826,000 euro). There are 127 companies registered to provide international telephony services, although only 17 are currently active. IP telephony services only require an "informatics" licence, which costs 2500 MDL (161 Euro) for five years.[25]

Ninety-six interconnection agreements have been agreed between Moldtelecom and IP telephony and data transfer operators, the vast majority of which are still in operation. Moldtelecom has interconnection agreements with twelve fixed line operators and forty-nine international operators.

VoIP services have been legal since 1 January 2004. Due to the fact that the incumbent's tariffs are not yet fully rebalanced, the ANRTI imposed an Access Deficit Charge (ADC) on VoIP providers as compensation for the uncovered costs of the local network. The ADC is revised at each rebalancing step and was diminished from 2.48 MDL (0.15 Euro) per minute in 2001 to 0.39 MDL (0.025 Euro) per minute in 2005. As soon as tariffs are fully rebalanced the ADC will be withdrawn. Illegal termination of VoIP traffic on Moldtelecom's network has not been identified as a major problem.

Revenue sharing for per minute charges has been available for dial-up ISPs since 2002. The share of the per minute charge is Moldtelecom/ISP 0.032/0.016 MDL (0.002/0.001 Euro).[26]

There are four operators in the mobile market, Voxtel (GSM),[27] Moldcell (GSM),[28] Moldtelecom (CDMA) (recently licensed[29]) and Interdnestrcom.[30] The last company is a non-licensed CDMA operator in Transdniestria.

[24] See http://www.moldtelecom.md/services/telephony/

[25] Law on Licensing Articles.8,45 and 18, 1

[26] Data from ANRTI

[27] http://www.voxtel.md

[28] http://www.moldtel.md

[29] http://www.moldtelecom.md

3.2 Numbering

The National Numbering Plan (NNP) is developed by ANRTI and approved by the Ministry of Information Development (previously the Ministry of Transport and Communications). Based on the 2001 Telecommunications Law (Article 9g), ANRTI is responsible for developing and managing the National Numbering Plan as well as allocating and managing numbering resources. These tasks are to be carried out by ANRTI in a transparent manner, ensuring equal conditions and impartiality in number and code allocation. Freephone, premium rate and VoIP numbers as well as SMS short codes are all available and the fees paid by communications service providers for the allocation of numbering blocks are used to fund ANRTI.

The provisional procedure on number allocation was replaced in early 2006 by a Regulation on the Administration and Management of the National Numbering Plan. Management and allocation by ANRTI must be objective, proportionate and non-discriminatory.

About 90 applications in total were filed with ANRTI for numbering resources in 2005. 13 new fixed telephony companies were licensed in 2005, 8 of which were allocated numbering resources. Only 5 of 33 fixed operators licensed in 2006 were allocated numbering resources. Overall, fees for number allocation were reduced by between 20 percent and 40 percent in the course of 2005. Numbering fees vary according to the numbers being sought: for instance, short codes for transport services outside the capital cost 4,000 Lei (258 Euro); short codes for transport services within the capital cost 20,000 Lei (1,288 Euro); mobile and most fixed numbers cost 0.2 Lei (0.013 Euro); telephone network access codes 20,000 Lei (1,287 Euro); access codes for directory services 5,000 Lei (322 Euro); and access codes for IP telephony services 4,000 Lei (257 Euro). Number blocks normally consist of 1,000 numbers.

According to national rules, number blocks for telecommunications network operators are allocated to legal entities registered in Moldova that hold licences for offering telecommunication services. Recipients of short codes, identification codes and free phone service numbers are not permitted to re-allocate them to a third party.

The new NNP, approved by the Ministry of Transport and Communications on 8 April 2003,[31] was developed by ANRTI in conformity with ITU Recommendations and the CEPT Recommendation on Numbering.[32] The NNP and some amendments to the document were published in ITU Operational Bulletin number 785.[33]

In the latter half of 2005, Moldtelecom updated its systems to phase out the short codes 9, 9x and 9xxx, with a new system starting with the digit 1. The purpose of the update was to improve access to numbering resources for alternative operators and to offer additional number ranges for the provision of new services. The 112 emergency number is being

[30] http://www.idknet.com

[31] Published in the "Official Gazette of the Republic of Moldova" 76/104 of 22 April 2003.

[32] http://www.anrti.md/ro/acte/num.htm

[33] Number 785 of 15.09.2003, number 799 of 01.11.2003, and number 817 of 01.08.2004

phased in, gradually replacing the 901-fire, 902-police, 903-ambulance and 904-gas numbers.

Number portability is planned but is not currently available.

3.3 Rights of Way and Facilities Sharing/Collocation

The legal and regulatory framework in Moldova establishes a non-discrimination principle for granting rights of way and promotes facilities sharing where additional rights of way cannot be given because of applicable essential requirements, such as environmental protection and/or town and country planning objectives.

Difficulties and delays in obtaining rights of way and building permits for network infrastructure remain an important concern for operators in Moldova, particularly as regards the roll-out of fixed networks and obtaining interconnection. New entrants have identified a variety of problems with regard to rights of way, such as the granting of specific rights to the incumbent, lack of transparency in procedures and the unclear division of competences between the different levels of authority with responsibilities in this field. This has led to disadvantages for new entrants and significant delays in the deployment of new infrastructure. Mobile network operators, for instance, have reported persistent problems with regard to the granting of rights to install mobile masts and antennae, often due to health and environmental concerns.

National planning decisions are made by the Ministry of Information Development (formerly the Ministry of Transport and Communications) and by the head office of Moldtelecom.

The Government established a State Commission for the Regulation of Entrepreneurial Activities[34] in February 2005 to simplify official procedures, remove “red tape”, and to monitor the activity of Public Administration Authorities with regulatory responsibilities. The Commission’s recommendations for changes to the institutional framework or in response to perceived excessive regulation by public authorities have to be enforced by Government decisions.

Despite existing established procedures being in place for facilities sharing in the Interconnection Regulation, the incumbent reportedly draws out the process as long as possible. In addition, it is very difficult for new entrants to have access to the ducts of the incumbent to install fibre optic cables. Generally, new entrant company managers do not publicly criticise Moldtelecom for fear of possible negative consequences for their future relationship with the company. Therefore ANRTI is having individual discussions with every new entrant in order to understand the problems and to facilitate the establishment of interconnection.

The Interconnection Regulation also establishes non-discriminatory procedures for collocation. However, the incumbent operator argues that it is non-dominant in the market, that it has reasonable prices, and that it is a champion of state interests (underlining, for example, that Moldtelecom is a 100 percent state-owned Joint Stock Company). Before May

[34] Government Decision nr.132 of February 8, 2005, Monitorul Oficial nr. 24-25 of February 11, 2005

2005, collocation agreements had to be coordinated with the former Ministry of Transport and Communications and were not signed until the Minister accepted them.

Since May 2005 no such approval is necessary. Nevertheless, the Association of Private Operators representatives expressed the opinion that the situation with regard to collocation has deteriorated: the incumbent is not permitting collocation at all, basing its refusals on lack of free space for the additional equipment. ANRTI has extensive powers, under Article 9 of the Telecommunications Law, to check the veracity of any such claims. These powers include the right to have free access to premises and relevant documentation. The use of these powers is opposed by Moldtelecom.

The 2004 Regulations on the Delivery of Collocation Services by Moldtelecom S.A[35] provide an example of Moldtelecom's procedures for facility sharing. Enterprises that deliver telecommunications and data transport services and that construct networks can lease space within the telephone exchanges of Moldtelecom S.A. and place their own equipment there. The rental payment is set according to existing tariffs.

To lease the space it is necessary:

(1) To submit a written application to the General Director of Moldtelecom S.A. in order to receive the technical conditions for the placing of equipment in the leased area. The application should contain the following information:
- Type of equipment and placement conditions;
- Equipment size;
- Plan of communication layout; and
- Copies of activity licences and of licensing conditions.

(2) The appropriate branch of Moldtelecom S.A. will then provide the applicant, within 15 calendar days from the date the application is filed, with the plan of the room in order to develop the project.

(3) Moldtelecom S.A. will subsequently assess the equipment placement project within 15 calendar days from the submission date and, where the application is approved, will conclude the collocation contract.

ANRTI decisions and regulations which are deemed to contradict legislation can be appealed by an action filed in an administrative court.

3.4 Tariff Policy

In 2004, 75 million MDL (5 million Euro) from international call charges were used to subsidise local network costs, according to the national regulator.

The Moldova-European Union Action Plan (signed in 2005) foresees the implementation of effective liberalisation in the telecommunications market and tariff rebalancing is an important aspect of this. Since 2003, tariff rebalancing has been gradually implemented in Moldova in all relevant activities of Moldtelecom S.A. The rebalancing process has been completed for business and standard residential customers. However, there remain issues to

[35] Available from http://www.moldtelecom.md

be resolved with regard to the management of rebalancing for sections of the population considered by the government to be most vulnerable to the negative effects of rebalancing.

In March 2005, ANRTI prepared the next steps for rebalancing and submitted its proposal to the Government for consultation, as required by the relevant legislation. Because Telecommunication Law (Article 9.1.d) requires ANRTI to only approve tariffs for SMP operators "*after consulting with the Government,"* the rebalancing process is suspended until the Government agrees with the proposed tariffs.

3.5 Cost Accounting

In Moldova, interconnection regulation provides the following pricing principles for interconnection services and access:

- Prices for interconnection services and access must be cost-oriented, reasonable and provide adequate remuneration for operators.
- Prices shall be determined based on *the long run average incremental costs approach* (LRAIC), to be implemented in the future. On a provisional basis, until this approach is implemented and existing cost accounting capabilities are sufficiently developed, particularly with regard to fixed assets, interconnection prices shall be calculated based on current costs.
- Interconnection and related services and facilities shall be provided on a disaggregated basis.

Prices for interconnection or access to infrastructure and network facilities, including those for collocation, must reflect the cost of the network, infrastructure or service components used for these purposes. Prices must not include infrastructure or service components not used for interconnection or access.

Although the framework is in place, the level of implementation of cost accounting is low. However, ANRTI is working on improving the cost accounting models and cost orientation of charges and tariffs. Nevertheless, audits have revealed uncertainty regarding the cost figures used to determine prices as well as the transparency of the information used.

As regards accounting separation, i.e. the requirement to keep separate regulatory accounts for the purposes of cost transparency and to prevent possible anti-competitive practices, Moldtelecom is requested to have separate accounts for its different service offerings. Moreover, these separate accounts must be prepared in a comprehensive way, to include key elements such as transfers between business units.

ANRTI worked to improve its LRAIC methodology in 2005; with planned implementation in 2006. The National Program on the implementation of the European Union-Moldova Action Plan stipulates implementation of LRAIC in 2006. However, implementation did not take place in 2006 but this is expected to happen in 2007, after the adoption of the new Electronic Communications law. This indicates that Moldtelecom's accounting system is not yet sufficiently transparent and comprehensive. Moldtelecom does not agree with the need for the implementation of such cost accounting and consequently has not taken measures to ensure faster implementation.

3.6 Universal Service

Moldovan national legislative acts in force do not include any special provisions regarding universal service except the definition in the 2001 Law on Telecommunications. According to this Law, universal service is a minimum set of services of an established quality, available to all users, regardless of their geographical location, and according to specific national conditions.

The Development Strategy Paper on Telecommunications approved by Order 48 of the Ministry of Transport and Communications on 26 February 2003 provides the main guidelines for universal service. It states that universal service is designed to ensure access to voice telephony for all citizens at an accessible price, including economically unprofitable users. Examples of non-profitable users include those in rural or remote locations or subscribers with reduced income.

The regulator has received complaints from the incumbent and from new entrants regarding the method of procurement for universal service provision and the ownership of installed equipment for universal service obligations used within the 2005 pilot project on universal service.

The draft Electronic Communications Law contains a special chapter on "Universal Service", defining the term and establishing how it will be implemented. For example, art. 75(1), a) stipulates that the methodology for calculating the net costs of universal service obligations is to be developed by the Agency and approved by the Government. This involvement obviously further limits ANRTI's independence. Art. 76 (2) stipulates that a universal service fund shall be created by Government Decree and managed by the NRA. Art. 67 (2) art. 76 (4) and (5) assigns the Government the responsibility to designate the providers with universal service obligations, to approve and publish the amount of obligatory contributions to be paid into the fund for the following year, establish the procedures and terms for paying such contributions into the fund, as well as to publish the mechanisms of financing and/or compensate for the net costs.

EU universal service concepts such as calling line ID and competition in directory services are not currently managed under national law. Such provisions are included in the draft Electronic Communications Law, however. On the other hand, there are no measures to ensure services to disabled users, such as Braille bills for blind users.

In December 2005, new rules on access to number information were adopted by ANRTI under which telephony providers must provide directory enquiry services.

3.7 Local Loop Unbundling

In Moldova, the Telecommunications Law does not directly stipulate specific provisions for LLU. However, the Interconnection Regulation approved on 13 March 2002 provides a

regulatory basis for LLU. According to the Regulation, the dominant operator shall provide unbundled access to the local loop under non-discriminatory and transparent terms based on cost oriented prices. ANRTI reports that 5,701 lines have been unbundled – a rate of less than 0.6 percent.

Notified operators must publish a reference unbundling offer (RUO) suited to market needs; in other words, it must be sufficiently detailed to allow competitors to choose only the network elements and facilities they require. Notified operators must also meet reasonable requests for unbundling and apply transparent, fair and non-discriminatory conditions, meaning that they must provide other operators with facilities equivalent to those provided to themselves and their subsidiaries. The tariffs charged for unbundled access must be cost-oriented.

The issue of how to verify claims of lack of space in the exchanges has not yet been solved. Procedures for alternative, low-cost, adjacent or remote collocation services for new entrants are expected to be established when new Electronic Communications Law is adopted. Co-mingling is actively discouraged by the incumbent.

ANRTI has requested information from Moldtelecom regarding the use of its fibre-optic network to establish what possibilities exist for unbundling of network elements.

Moldtelecom collocation space prices

Locality	Unit	Amount, monthly
Chisinau	Lei/4m^2	1,000 / 64.38 Euro
Balti	Lei/4m^2	600 / 38.6 Euro
Other localities	Lei/4m^2	350 / 22.5 Euro

Alternative operators are complaining about new procedures on collocation which Moldtelecom claims are necessary to ensure the confidentiality of phone calls. There are also failures reported in the delivery of services for unbundled loops, which Moldtelecom blames on lack of technical capacity.

3.8 Leased Lines

The Telecommunications Law (2001) and Interconnection Regulation (2002) require transparency, non-discrimination and cost-orientation for the supply of all services, including leased lines and leased line part circuits. Moldtelecom is required to supply a minimum set of leased lines at every point in the national territory as per the special ANRTI Decision 28 of 6 October 2004 concerning the designation of S.A. Moldtelecom as the country's transit operator. However, there is not yet an established cost accounting scheme in place for the incumbent operator.

Despite the fact that regulatory obligations for transparency and cost orientation exist, new entrants often have to rely on retail tariffs with discounts or retail-minus pricing. Consequently, there are still segments where the cost-orientation of leased line tariffs is not fully ensured.

The pricing structure is very complex, with 32 different permutations of price, depending on the length of the line (prices change at 20 km increments) and for every increment of 64kbps in line speed (from 64kbps to 2048kbps). For example, a 64k leased line of 80km-100km costs 105 Euro per month; a 1024k line of the same length costs 235 Euro; and a 2048k line of that length costs 340 Euro.[36]

Installation times vary widely and Moldtelecom's services are significantly slower than other providers. Based on discussions with industry, repair times across the sector appear to be two to four hours.

Below is a brief overview of international leased line pricing in Moldova (all prices in Euro).[37]

International Leased Line Pricing in Moldova (Euro)

	EU (average)	Moldova	EU (average)	Moldova
	64 kbps		**2mbps**	
Near EU country	7,500	785	100,000	7,850
Distant EU country	10,000	1,160	130,000	11,600
USA	12,000	3,863	150,000	38,630

3.9 Mobile Services

There are two mobile 2G GSM 900 operators in Moldova, Voxtel[38] and Moldcell,[39] and there are no MVNO's currently in the market. In addition, Interdnestrcom[40] provides unlicensed CDMA services in the Transdniestria region. The third mobile licence was issued to the incumbent fixed line operator, Moldtelecom, in June 2006. In October 2006, the Government decided to pave the way for another GSM operator and the tender for awarding the licence was launched in November 2006.

The launch of 3G services is planned in the National Strategy on Building the Information Society in Moldova, although specific timetables have yet to be set.

According to the NRA, as of 1 July 2006, there were 1,194,500 mobile subscribers in Moldova, representing a penetration rate of 35.2 percent. In the first six months of 2006, again according to ANRTI, Voxtel increased the number of subscribers by 68.5 thousand and Moldcell by 36.2 thousand. The total revenue of the mobile market for the first 6 months of 2006 reached 826.8 million Lei (53.23 million Euro)

As of 1 July 2006, Voxtel had a 60.1 percent share of the mobile services market and Moldcell 39.9 percent.

[36] All figures from Moldtelecom S.A.(http://www.moldtelecom.md/docs/tarife_CrossNet_International_ro_2006.pdf)

[37] Sources: Brussels, 2.12.2004 Sec(2004)1535 Volume ii, Commission Staff Working Paper, Annex to the: European Electronic Communications Regulation and Markets 2004 (10th Report); Moldtelecom S.A.

[38] http://www.voxtel.md/

[39] http://www.moldcell.md/eng/

[40] http://www.idknet.com/english/

Prepaid cards are far more prevelant than other forms of payment, respresenting 84 percent of total number of users. There is a slow increase in the proportion of postpaid customers, which grew from 14.8 percent in 2005 to 16 percent in 2006.

Investment in mobile infrastructure in the first six months of 2006 reached 153.4 million Lei/9.877 million Euro: Voxtel spent 97 million Lei/6.24 million Euro and Moldcell invested 56.4 million Lei/3.63 million Euro.

EDGE services have started in Chisinau by Moldcell and, according to the Basa press agency, on 9 September 2005, 30.26 percent of the population was covered by these services. TeliaSonera, a major shareholder in Moldcell, has indicated that it intends to invest 60 million US$ (49.6 million Euro) over the coming five years for rollout of EDGE services.[41]

WAP services were used by 23,032 users in 2005.[42] The cost of using WAP services is 0.045 Eurocents/minute.[43]

ARPU per month was 121 Lei (7.79 Euro) in 2005. This represented a 9 percent increase in comparison with 2004.

On average, 25 SMS messages per subscriber are sent by mobile subscribers per month (October 2006 data).[44]

The standard service package for fixed line services costs 1.45 Euro per month.[45] In comparison, the average monthly mobile subscription for Moldcell's "Fantasy" package, for example, is 2.18 Euro.

3.9.1 VOXTEL

On 12 September 2005, the mobile operator Voxtel launched GPRS services. The new service package "Internet Mobil Online" was announced on 13 September together with a new Portal "My Voxtel". In the first 10 days after the launch, more than 6,000 subscribers connected to the IMO service. On October, 2006, Voxtel had over 200,000 GPRS subscribers. MMS messages cost 0.15 US$/0.12 Euro per message for post paid subscribers and 0.25 US$/0.21 for prepaid clients.[46]

Mobile Internet services for contract customers cost approximately 0.41 Euro per megabyte.

Voxtel reports an average of 15 SMS per month (9.2 SMS for prepaid customers) per subscriber.[47] 34.7% of population covered by EDGE services, 91.6% of the territory of Moldova and 95.2% of the population are covered by Voxtel mobile services. The company said it had 800,000 consumers at the end of October 2006.[48]

---

[41] BASA-economic Chisinau-03.10.2005/15:12:09

[42] Information received from ANRTI

[43] Information received from Moldcell

[44] Based on Moldcell information

[45] Information received from Moldtelecom

[46] http://www.voxtel.md/imo/index.html?PHPSESSID=ddff34ac2bcf5d527802f5d8ba563def#4

[47] Voxtel information (September 2006)

[48] http://www.voxtel.md/ (18.10.2006)

As from October 2006, international tariffs have been decreased by 10%-40%.

3.9.2 MOLDCELL

As of September 2005, one third of the Moldovan population had access to Moldcell EDGE services, with 88 percent having access to its GPRS services. Moldcell also offers an "IPCell" service offering international VoIP services at comparatively low rates (2.39 Lei / 0.15 Euro per minute for European landlines, for example). Moldcell also offers Java game downloads.

As of October 2006, MOLDCELL's network is available to 89.44% of population on 90.70% of the territory of Moldova.[49]

Moldcell decreased the prices for WAP and Mobile Internet by 50%, with MMS being offered at the same price as SMS (August-November 2006). The tariffs for using the MMI service (WAP and Mobile Internet) for Moldcell (contract) subscribers is 0.3 MDL(0.02 Euro)/100 KB (VAT inclusive) and for ALOCARD (non-contract) users: 1 counter (costing from 1.9 lei to 0.44 lei or 0.12 to 0.03 Euro depending on the volume purchased)/200 KB.

In collaboration with the DNT Association,[50] Moldcell offers the possibility of being informed about every new e-mail message received by subscriber of the MAIL.MD service. For every new email message that is received, an SMS notification containing the sender's name, e-mail subject and date of email delivery is sent.The price for a received SMS notification is the same as the price of sending an ordinary SMS.

3.9.3 TRANSDNIESTRIA MOBILE MARKET

There are 2 companies providing services in the Transdniestria region: Transtelecom[51] for fixed services and Interdnestrcom (established in 1998) for fixed and mobile services in CDMA 850MHz and CDMA 450MHz bands. The CDMA 450MHz technology network was implemented in May 2005 and has almost 95 percent coverage of the territory. The number of mobile subscribers was 60,000 in 2005.

3.10 Satellite Services

Moldova is a small country with a relatively uncomplicated terrain for the rollout of communications networks. Satellite communications within the country are not economically feasible because the distances between villages and towns on average are not more than 5-10 kilometres.

Moldova installed two ground stations for international satellite communications in 1992 for connection with Europe (through Telecom Danmark), and with North America (through

[49] http://www.moldcell.md/Coverage/Moldova

[50] http://www.dnt.md

[51] http://www.transtelecom.md/

Teleglobe Canada). These ground stations created direct connections with European and overseas countries, bypassing Russia. Moldova also has ground stations ensuring interconnection with Russia and for overseas communications (Americas, Australia).

TELEPORT Chisinau is offering 155Mbps broadband Internet services to operators and corporate users via the Skyvision Global Networks Company.[52] There are residential satellite services in Moldova, and no geographic areas exist that need universal service to be provided by satellite.

The NREN RENAM[53] is supported by satellite.

3.11 Status of the National Regulatory Authority (NRA)

The national telecommunications regulatory body in Moldova is the National Regulatory Agency in Telecommunications and Informatics (ANRTI). There are some ambiguities in the division of functions between the different relevant state bodies (Ministry of Information Development, State Communications Inspectorate, Ministry of Economy and ANRTI) in the licensing process and definition of significant market power.

The dominant operator, Moldtelecom S.A., after four attempts at privatisation, remains a Joint Stock Company with 100 percent state ownership. This creates some tension between ANRTI and the Ministry of Economy and Trade, which is responsible for the incumbent as state property and the Ministry of Information Development, responsible for policy in the sector.

ANRTI possesses basic financial resources to enable it to fulfil its tasks. However, concerns have been raised regarding both the level of expertise and general staffing of the agency.

The range of regulations that is overseen by ANRTI includes the following:

- Overseeing regulation and technical standards in the ICT sector;
- Licensing, monitoring and combating anti-competitive behaviour;
- Approval of tariffs for public ICT services, when the operator holds a dominant position on the market for these services;
- Management of the ccTLD ".md";
- Establishment of principles and rules of interconnection;
- Ensuring equal conditions of access to ICT networks for all users, as well as guaranteeing free access to data transfer through public networks, regardless of the type of ownership;
- Monitoring and inspection of licence conditions;
- Application of sanctions, including fines, within its competence and in conformity with the provisions of the law.

Competence overlaps in the transitional phase between the Ministry of Transport and Communications (responsible for policy until May 2005) and the new Department of Information Development has resulted in ineffective or late regulatory interventions.

[52] http://www.sky-vision.net/easternEurope.asp

[53] http://www.renam.md/

The Competition Protection Authority that was to be created under the provisions of the Competition Law (2000) has yet to be set up. As ANRTI does not, it appears, politically able to designate Moldtelecom as holding SMP, this makes imposition of effective regulatory measures significantly more difficult.

On 19 October, 2005, the Government adopted a Decision on the establishment of the National Agency for the Protection of Competition.[54] The Parliamentary Committee for Economic Policy, Budget and Finances adopted amendments to the Law on Competition Protection in its first reading on 2 November 2005 (a second reading is still required)[55] to take account of changes in circumstances since that law was drafted in 2000. The amendments stipulate, inter alia, that some important decisions regarding compensation and damages will be taken at the Competition Protection Authority's initiative and through the courts. The proposals also support the creation of a National Agency for the Protection of Competition that is independent from the Government.

There are established guidelines and timetables regarding how quickly the NRA has to deal with disputes in the Regulation on Dispute Resolution between Operators, and between Operators and Users by the National Regulatory Agency for Telecommunications and Informatics. The Regulation establishes the following timetable:

- Within five working days of receipt of a request for dispute settlement, the [Legal Office] of ANRTI will determine whether the application is complete and meets the requirements of Section 2(c) and notify the parties of its decision.
- If the petition is accepted, the respondent will have seven working days in which to submit a reply to the observations and documents in the complaint. The reply should also state the name and contact information of the person whom ANRTI should contact to discuss the details of the dispute. If the name of the contact person changes, the respondent must inform ANRTI of the new information.
- The complainant may submit a response to the respondent's reply within five working days of receipt of the reply. The respondent will then have five working days to submit, if need be, a second reply.
- The request for dispute settlement and all written pleadings will be submitted within 22 working days, or approximately one calendar month from the initial complaint.
- All documents and any other material filed by any party must be delivered by hand to ANRTI and the other party to the proceeding. Ten copies of all pleadings should be filed with ANRTI.
- ANRTI will have four months from the time it receives the respondent's initial response to reach a decision. ANRTI may extend this period to six months if it is necessary to obtain an expert's opinion.

ANRTI has evidence that systematic appeals are being used by the incumbent operator as a method of delaying the implementation of NRA decisions in favour of new entrants.

ANRTI publishes draft documents on its web page[56] for public consultation and conducts public hearings.[57] The consultation processes of ANRTI appear to be sufficiently transparent

[54] Info-Prim Neo News Agency, 20 October 2006

[55] Chisinau-02.11.2005/12:32:50/(BASA-business)

[56] http://www.anrti.md

[57] http://www.anrti.md

and major market players consider them adequate. However, avoiding undue lobbying pressure by service operators, such as the incumbent, remains a problem for ANRTI because of the level of state ownership. Any regulatory intervention for accelerating the liberalisation process can be interpreted as negatively affecting the interests of the state.

The European Union-Moldova Action Plan stipulates the need to: "*[e]nsure the independence, increase the powers and improve the efficiency of the National Agency for Regulation in Telecommunications and Informatics (ANRTI) by providing additional human and financial resources and increasing enforcement powers.*" Increased focus on the independence, powers and efficiency of ANRTI should serve to significantly improve its effectiveness in ensuring transparency and competition in the Moldovan electronic communications sector.

There are 3 main provisions in the existing Telecommunications Law which undermine ANRTI's ability to act independently of Government:

- Nomination of the Directors by the Government
- Consultation with the Government (before approval) of tariffs for dominant operators
- Annual budget approval by the Government

The level of administrative problems in ANRTI can be shown by the fact that the organisation has not had a chairman since December 2005 and one of the two deputy chairman posts has been vacant since June 2006. The one deputy director in office is not in a position to take executive decisions on his own, effectively paralysing the decision-making powers of the authority. These problems would not be solved by the current draft of the new Electronic Communications law.

In 2005, the Moldovan government proposed a merger of ANRTI with the National Agency for Energy Regulation. The draft Law was approved by Government Decree 692 of 13 July 2005 and submitted to the Parliament. The Parliament has postponed its examination of the proposal due to an alleged lack of clear justification for the move.[58] Various international organisations such as the World Bank and IMF[59] have expressed concern about the proposal. The study team has not found, and is not aware of, any clarification being available from the Moldovan government as to why it wishes to take this step.

ANRTI is funded by by a levy of up to 0.3 percent (in 2006 this figure was 0.2 percent) of revenue generated from communications service provision. In 2006, this equated to 7,280,000 Lei or approximately 468,000 Euro.

3.12 Licensing and Authorisation

Licensing procedures for the telecommunications and informatics sector are laid down in the Law on Telecommunications (1995, amended 2001) and the Regulation on Licensing in Telecommunications and Informatics Sectors (2002). Additionally, Articles 5, 8, 9(1), 18, 22(6-8) and 23 of the Law on Licensing Certain Types of Activities 451-XV of 30 July 2001

[58] Basa Press 28.09.2005-Basa-Economic.

[59] Copies of correspondence between various international organisations and the Moldovan authorities have been seen by the study team.

apply to the telecommunications sector. The National Regulatory Agency in Telecommunications and Informatics is responsible for licensing in the telecommunications and informatics sector in Moldova.

On the basis of Article 8 of the Law on Licensing Certain Types of Activity, ANRTI can issue licences for the following types of activity:

- Fixed international, local and/or long-distance telephony service provision;
- Cellular mobile and/or satellite telephony service provision;
- Informatics service provision; and
- Construction, maintenance and/or operation of radio and television stations and cable television networks.

Licences issued by ANRTI are classified in two categories:

- Individual licences: licences for the use of scarce resources (radio frequencies, numbering resources, etc.) and/or licences of special state interest.
- General licences: licences that do not provide for the use of limited resources and/or are not of special state interest.

The Commission must adopt a decision regarding licence issuance or application rejection within 15 days for general licences and 30 days for individual licences from the day the applicant filed the complete set of necessary documents. If the licence is issued on the basis of a tender, the period of tender proceedings will not be included in the licence issuance period.

The following can serve as grounds for rejecting an application:

- The applicant did not submit the complete set of documents necessary for obtaining a licence;
- Erroneous data in the documents submitted by the applicant;
- Unavailability of resources (frequencies or numbering resources); or
- Request for a type of activity that is under the control of the state monopoly or is not included in the Licensing Regulation.

The licence fees for telecommunications and informatics services (including VoIP) are stipulated in the Law on Licensing and in the Licensing Regulation and are as follows:

- The fee for a licence to provide mobile cellular services or interurban and international fixed telephony services must not be less than the equivalent of 1 million US$ (826,446 Euro). Government Decision 296 of 18 March 2005 set the price for a cellular mobile CDMA 2000 450MHz licence at 8 million US$ (6,661,570 Euro). Decisions regarding the issuance of the various licences must be published in the Official Monitor of the Republic of Moldova.
- The fee for all other licences is 2,500 Lei (161 Euro)
- The fee for re-registering a licence is 10 percent of the total cost, while issuing a duplicate of a licence is 50 percent of the total cost.
- The licence fee is transferred to the state and to the local budget, as appropriate.

In a general effort at reducing bureaucracy, the Government approved by Decision 920 of 30 August 2005, the List of Authorisations, Permissions, and Certificates to be issued by central

public authorities for legal and natural persons for entrepreneurial activities."[60] According to this document, the authorities are obliged to issue the requested certificate or authorisation included in the List within ten days from when the request is submitted. Several certificates are issued without payment. This serves to simplify procedures and reduce costs for market players.

Although licensing procedures have been simplified over the past few years, ANRTI has recognised that the lack of involvement of the smaller market players in the consultation process with regards the simplification of procedures undertaken under the "Guillotine Law"[61] meant that not as much progress was made on improving licensing procedures as could otherwise have been the case.

IT companies consider that there is a contradiction between ANRTI Regulation on Licensing and the legislation in force, specifically that the law provides that IT companies should not need licences for their activities on development of IT systems and software.[62]

3.12.1 CDMA Mobile Licence

The CDMA 450MHz licence initially issued by ANRTI to Interdnestrcom and withdrawn in the same month (in 2004) based on the Constitutional Court Decision, was finally awarded to Moldtelecom (21 June 2006).[63] The licence was awarded directly and the national operator paid fee of 8 million US$ (6.61 million Euro). Moldtelecom intends to launch a mobile telephony service by the end of 2006.

The leading mobile operator, Voxtel, expressed its concern about the allegedly non-transparent procedure used to award this licence and requested that ANRTI take the measures necessary to prevent cross-subsidising of Moldtelecom services and that it develop measures to ensure such opaque licence-allocation procedures not being used in the future.[64]
Mobile licences are published on the ANRTI website: http://www.anrti.md

3.12.2 CDMA WLL Licensing

On 23 September 2005, ANRTI issued Decision number 15 On Regulating Local Fixed Telephone Networks That Use Radio Access WLL based on CDMA Technology.[65] The Document was issued in view of the installation by Moldtelecom of a CDMA 2000 network in the 450MHz band under the provisions of its fixed telephony Licence.

Under the Decision, a fixed network licence holder must:

---

[60] Government Decision nr. 920 of 30.08.2005 "Concerning Classified List of Authorisations, Permissions and Certificates Issued by Central Administration Authorities and Their Subordinated Bodies for Natural and Legal Persons for Entrepreneurial Activity" Official Gazette nr. 126-128 of 23.09.2005.

[61] A law which establishes a process whereby legislation that is considered counterproductive is repealed or "guillotined". For other examples, see http://www.kafka.be and http://www.bulldozer.ba

[62] Source: Endava srl

[63] http://www.anrti.md/ro/licen/Cond%20lic.htm

[64] Voxtel press release 1.07.2006 http:// www.voxtel.md

[65] Official Journal of the Republic of Moldova nr.129-131 (1728-1730) din 30.09.2005

- limit the mobility of the terminal equipment connected to a terminal point of the fixed telephone network;[66]
- prevent automatic call handover between sectors and base stations;
- install only fixed CDMA terminal equipment without R-UIM cards, at the premises of local fixed telephony subscribers connected to the local fixed telephony network via WLL;
- use specific geographic numbering blocks;
- inform subscribers of the terms of use of the WLL service.

The Decision was considered necessary to avoid a situation where Moldtelecom could provide mobile services without the relevant licence.

3.12.3 3rd GSM Licence

In October 2006, the Government announced its decision to permit a third GSM 900/1800 mobile telephony operator to enter the market and established an 8 million dollar (6.61 million Euro) fee for this licence. ANRTI will now organise a contest for the selection of the future operator.

The winning bidder will pay half of the fee within 30 days after receiving the licence and the remainder after two years.

The first two GSM operators, Voxtel and Moldcell companies cautiously welcomed the decision. They called for the development of the mobile telephony market in Moldova, but under equal and transparent conditions. They consider that, in spite of the dynamic development of mobile telephony market, there is little spare capacity in this market and it may be difficult for four mobile telephony companies to attract enough revenue to ensure adequate investment.[67]

3.12.4 3G Licence

Although the National Strategy "e-Moldova" foresees the issuing of a 3G licence, the government does not yet seem to have a view with regard to when and under what conditions this would happen.

3.13 Spectrum

Considerable progress has been made in Moldova in recent years towards greater consistency in the management of radio frequencies. There is now a published National Frequency Plan and an authority (SCRF – see below) designated as responsible for

[66] "Terminal point of the fixed telephony network": a physical point where the subscriber is offered access to a public fixed telephone network, in which routing or switching is used; this terminal point is identified by a fixed address of the network that can be associated with the number assigned to the subscriber

[67] Basa press, 06.10.2006 / 09:14 / EEN0959

frequency management. The State Communications Inspectorate, SCI, regulates spectrum use in Moldova. No major outstanding problems regarding general frequency management have been reported.

Article 32 of the Moldovan Telecom Law states that "*spectrum is a national resource*." The State Commission for Radio Frequencies (SCRF), under the responsibility of the Government, administers national spectrum in Moldova. The SCRF acts pursuant to regulations approved by the Government. The SCRF drafts and implements state policy on allocation and use of radio frequencies spectrum and the positions of geo-stationary orbits. The SCRF approves the National Table of Radio Frequencies (NTRF) for public use, protection and security. The table was first published in 2000, in line with the European Table of Frequency Allocation, and was last amended in 2005. The SCRF is also responsible for the procedure of allocation of radio frequencies for general use. Frequencies are allocated to licence holders (for GSM, CDMA, radio-broadcasting) or are authorised for use by legal persons for other radio services.

The Ministry of Information Development (former Ministry of Transport and Communications) allocates radio frequencies for public purposes. Payment for allocated radio frequencies is made to the SCI in accordance with the effective tariffs, approved by the Ministry (as amended by Law 842-XIV of 25 February 2000).

The State Communications Inspectorate (SCI) is given responsibility for assisting in the planning and allocation of radio frequencies by Article 38 of the 1995 Law on Telecommunication. The SCI conducts the following activities: planning and coordination on a regional and national level, management and monitoring of radio frequencies intended for civil purposes, and coordinating the installation and monitoring of electromagnetic wave emitting equipment designed for civil purposes in Moldova.

As the World Bank ICT Diagnostic Report says: "*in the area of frequency monitoring, Moldova is lagging in ensuring objective, transparent and non-discriminatory procedures insofar as the State Communications Inspectorate (SCI), the frequency regulator, is involved in decisions on allocation and use of frequencies, should be subject to the same regulatory controls as ANRTI*.[68] Therefore, while there are no major problems to report to date, some procedural difficulties have been identified.

Wi-Fi is permitted without a licence, although an authorisation is required.

[68] See, § 6 of the WTO Reference Paper dealing with Scarce Resources, Annex 2

4 REGULATORY ENVIRONMENT FOR ONLINE SERVICES

4.1 Digital Signatures

In July 2004, two key laws were adopted: the Law On e-Commerce[69] and the Law On Electronic Documents and Digital Signatures.[70] These laws establish the legal framework for electronic documents and digital signatures. These were followed in 2005 by the Regulation Regarding the Modality of Creation and Organisation of the Activities of Public Key Certification.

The laws give electronic documents the same legal power and effect as paper documents. The laws also provide definitions for terms such as: electronic document, digital signature, certification, certification centres and liabilities. The liabilities of all participants, including certification centres, involved in the development of electronic signatures are also specified.

The laws stipulate that the Government regulates the certification procedure and that certification centres will be licensed under the Licensing Law. However, digital signature certification centres for public authorities and for corporate use do not require a licence. There will be one top-level Certification Centre and others of a lower level.

The state Information and Security Service has been designated as the supervisory authority for digital signature procedures. The procedures for licensing, the legal and technical recognition of digital signatures, and authorisations for certification service providers are in the process of being established.

The laws appear to permit the functioning of an electronic document system and to contain the necessary minimal conditions listed in EU Directive 1999/93/EC on a Community Framework for Electronic Signatures.

Three further important regulatory documents were approved in April 2006. These were the Regulation of the Centre for Certification of High Level Public Keys,[71] the Regulation Regarding the Procedure of Registration of the Centres for Certification of Public Keys,[72] and the Special Conditions for the Activity of Centres for Certification of Public Keys.[73]

On September 14, 2006, the first Pubic Key Certification Centre was opened in Chisinau by the Centre for Special Telecommunications (CST). It issues keys for public servants working in public administrative institutions.[74] The Centre is preparing tariffs for providing services to

[69] The Law on Electronic Commerce Nr.284-XV of 22 August 2004. Official Gazette of the Republic of Moldova nr.138-146/741 of 13.08.2004

[70] The Law On Electronic Document and Digital Signature Nr.264-XV from 15 August 2004, Official Gazette of the Republic of Moldova nr.132-137/710, 06.08.2004

[71] http://www.sis.md/data/laws/ro1144695654REGULAMENTUL_CA_rom.pdf

[72] http://www.sis.md/data/laws/ro1144696159REGULAMENTUL_procedura_rom.pdf

[73] http://www.sis.md/data/laws/ro1144696227Conditiile_speciale_rom.pdf

[74] http://gov.md/index.php?a=snews&n=741&lng=ro

the general public, which are likely to be approved by the Ministry of Finance before the end of 2006.

4.2 Payment Systems

The 2005 e-Commerce Law establishes that goods and services must be paid for in accordance with international payment systems and Moldovan legislation. Integration into the international banking system has helped bring about the use of electronic payment systems. To ensure a procedural framework for the use of electronic payment systems, the National Bank of Moldova (NBM) approved Regulations 58/11-02 of 25 May 1997 regarding the organisation of bank card payments by commercial banks in the Republic of Moldova, and Regulation 404 of 25 December 1998 on the numbering of cards issued by the banks authorised by the NBM.

The NBM is the owner and the manager of an interbank payment system, which makes transfers of electronic credits both on behalf of participant banks and on behalf of their clients. With regard to card payment systems, the NBM has taken on the role of general regulator of the development and supervision of consumer rights. To implement this role, the NBM creates regulations, analyses risks and trends, and performs spot audits regarding the application of procedures.

The NBM has one more important function: it uses its interbank payment system to make all daily closing transfers of amounts collected by the commercial banks from card transactions.

A Regulation from the Administrative Council of the NMB was adopted in February 2005 and entered into force on 30 June 2005 (Official Gazette nr.98-100 of 22 July 2005). This Regulation provides Moldovan Banks with clear rules on bank card operations. It defines the rights and obligations of the issuing bank in organising the card payment system and in accepting and using cards, as well as rules for monitoring and reporting. It also details the rights and obligations of all actors in the banking cards payment system.

A new Regulation Regarding Automated System of Inter-bank Payments was approved by the National Bank of Moldova on March 2, 2006,[75] entering into force on 21 April 2006. This establishes rules and procedures for inter-bank payments through a new automated system on the territory of the country.[76]

On March 23 2006, Moldcell launched a service for clients who also are Eurocredit bank account holders. This service allows them to use on-line banking services (utility and other bill payments, balance information, etc) through the WAP site Telebank.[77]

[75] The Official Monitor of The Republic of Moldova nr.39-42/144 of March 10 2006

[76] http://www.bnm.md/romanian/docs/pr/71_4825.pdf

[77] http://www.moldcell.md/eng/news/view/228

5 USE OF ELECTRONIC COMMUNICATIONS SERVICES

The European Union Moldova Action Plan, signed in February 2005, indicates a commitment of the Government of Moldova to undertake effective measures to build a comprehensive Information Society. Introducing legislation and a regulatory framework in line with the new EU electronic communications framework is one of the main initiatives of the Plan. The Government has requested that all its institutions implement provisions of the Plan under monitoring from the Prime Minister's Office.

5.1 Fixed Telephony Penetration

According to ANRTI, the fixed telephony penetration rate rose from 19 percent in 2002 to 21 percent in 2003, to 25.5 percent in 2004, to 27.3 percent by the end of 2005, and to 28 percent in mid 2006. There is a significant urban-rural split, with urban penetration going up from 32.9 percent (2002) to 34.9 percent (2003) to 41.3 percent (2004) and 43.5 percent (2005) in the same period and rural penetration lagging at 10.7 percent (2002), 12.7 percent (2003), 15.6 percent (2004) and 16.4 percent (2005) respectively.

Practical efforts have been made to bridge the urban-rural divide. For example, a universal service pilot project launched in the Nisporeni district has created public access centres that are open around the clock and provide access to public fixed local, interurban and international telephony services, access to emergency services and access to the Internet.

Virtually 100 percent of businesses are connected to the fixed telephone network.

Under the National Strategy for the Building of the Information Society,[78] Moldova aims to reach the average level of fixed telephony penetration of Central Europe (i.e. 35 percent[79]) by 2010. Additionally, the Moldovan Village Programme aims to close the existing urban-rural gap.

From 2000 to 2006, there was an increasing trend of extending the digitalisation of fixed telephony networks, which was considered an important contribution to the improvement of services. Although the capacity of installed digital lines reached 59 percent in 2004, passed the 60 percent barrier in 2005, and stood at 67% in the first half of 2006, it still remains relatively low, and is much lower than in other Central European and EU countries, where the digitalisation of fixed telephony networks is almost complete.

The incumbent fixed-line operator, Moldtelecom, continues to dominate the ICT market in Moldova. Moldtelecom has heavily invested in the building of a CDMA2000 450MHz telecommunications network. It has invested a total of 680.9 million Lei (43.5 million Euro). Most investments were used to extend the capacity of exchanges, to connect new

[78] The National Strategy for the Building of the Information Society was approved by Government Decision 255 of 9 March 2005.

[79] See Telecommunications Year 2006, Telecom 2006, Bucarest 13 June 2006

subscribers, to modernise, develop and construct exchanges in district centres, and to develop and modernise exchanges and local loops in rural areas.

Moldtelecom has also invested heavily in a state-of-the-art fibre optic network that connects all of Moldova's urban centres. This CrossNet Network (an overlay network making it possible to provide leased lines over the whole territory of the country), which is now fully operational, made Moldtelecom the first telecoms company in the CIS to possess such a network. In 2001, Moldtelecom launched a video telephone service for videoconferences, of which the Government is the main user.

Moldtelecom's revenue from its fixed network in Moldova in 2005 was 1,968.5 million lei (128 million Euro) The market share of fixed telephony was 51.56% of total telecom market. In the first half of 2006 this revenue was 959,920 million lei (61,805 million Euro).

ARPU of fixed lines operators was 168,24 lei/month (10.8 Euro) for the first semester of 2006.

According to ANRTI, the market share in fixed market by revenues was as follows (2005):

- S.A.Moldtelecom – 99.58 percent
- Î.S.Calea ferată din Moldova (Moldovan Railways)– 0.0511 percent
- S.A.Riscom[80] – 0.0181 percent
- S.A.Arax Impex[81] – 0.3453 percent
- Sicres[82] – 0.004 percent

Investment in fixed telephony networks in the first half of 2006 increased by 47% compared with the same period in 2005, amounting to a total of 283.8 million lei (18.27 million Euro). The number of fixed subscribers increased by 21.5 thousand and reached 950,900, representing a penetration rate of 28%. Moldtelecom connected 17,600 new subscribers to its network, with alternative operators adding a further 3,900.

On July 1 2006, 42 fixed telephony licence holders were registered, although only six of them were actually providing services: SA "MOLDTELECOM, ÎS Calea ferată a Moldovei, RISCOM, ARAX-IMPEX, SICRES and Telcom Tehnologies.[83]

5.2 Mobile Usage

Mobile telephony is developing rapidly, and the user base continues to grow. Indeed, mobile penetration overtook fixed line penetration for the first time in 2005. The number of mobile subscribers increased from 787,000 in 2004 to 1,090,000 by the end of 2005 and 1,194,500 in mid 2006. This represents a penetration rate of 35.2 percent.

[80] http://www.riscom.net/

[81] http://www.arax.md/

[82] http://www.sicres.md/en/

[83] ANRTI press-release , September 14, 2006, http://www.anrti.md

According to ANRTI, over the course of 2004, Voxtel increased its number of subscribers by 31.4 percent and Moldcell by 22 percent. Voxtel had 60.5 percent market share and Moldcell 39.5 percent. In mid 2006, Voxtel had 60.9% and Moldcell 39.1%.of the market share.[84]

According to the ANRTI report 2005, revenues from mobile telephony services rose by 52.4 percent to 1,362 million Lei (87.7 million Euro). The revenues for the first half year 2006 were 826,800 million Lei (53.23 million Euro) and investment stood at 153,400 million Lei (9.876 million Euro).

Investment in mobile infrastructure in 2005 reached 449.3 million Lei/28.9 million Euro (Voxtel: 274 million Lei/17.64 million Euro; Moldcell: 175 million Lei/11.26 million Euro), an increase of about 40 percent year on year. The ARPU of Voxtel was at almost 142 Lei (9.14 Euro), while that of Moldcell stood at around 90 Lei (5.79 Euro).

Voxtel's geographic coverage stands at 91.6 percent while that of Moldcell services has reached 89.44 percent. The population coverage rates are 95.2 and 90.70 percent respectively.

Moldcell launched GPRS/EDGE services for use with computers at the end of 2005, at prices ranging from 84 Lei to 184 Lei per month (5.40 Euro to 11.84 Euro respectively) with traffic limits of 16 mb and 40 mb respectively.

5.3 Cable Services

The percentage of private households connected to cable networks is 48.5 percent,[85] with 27.6 percent actively subscribing to cable services.[86]

In the Chisinau area, there is some redundancy in cable networks, for example, in some areas there are 2 to 3 networks in one building.

5.4 Computer Availability

The percentage of households with personal computers is 10.2 percent, with a major difference between urban (80 percent of computers nationally) and rural households; while 28 percent of the population has access to a computer.[87] According to the Moldovan Statistics Agency, in 2005 the average monthly wage (January to November) in Moldova was approximately 1,285 Lei (about 83 Euro), which is approximately one quarter of the cost

[84] ANRTI press-release , September 05, 2006, www.anrti.md

[85] These data are from the ANRTI Annual Report 2004.

[86] Use of Information and Communication Technologies by the population of the Republic of Moldova PREPARED BY: Centre of Sociological, Politological and Psychological Analysis and Investigations CIVIS, for the UNDP-Moldova, Programme "Building e-Governance in Moldova" Chisinau 2005

[87] idem

of a new computer.[88] The number of personal computers in Moldova totalled 347,991 units in 2005.[89]

9.9% of employees use computers with an Internet connection at work. Of the companies that responded to the 2005 Business Survey questionnaire, there were 5.8 employees per computer. Between 2002 and 2004, the number of computers in business rose from 41,066 to 52,540, with the number of networked computers rising from 25,656 to 42,385 over the same period.[90]

5.5 Internet Access

The total revenue of leased lines and Internet access services in 2005 was 130.5 million lei (8.4 million Euro), or 3.59% of total telecommunications market, an increase of 35.23% over 2004. The total number of Internet connections increased by 340 percent and reached 223,224 compared with 65,743 in 2004.

The number of dial-up Internet connections in 2005 was 50,664, increasing by 26.9% from 2004. According to ANRTI, broadband access connections increased substantially. The number of broadband connections increased by 370 percent and the number of xDSL connections by 480 percent compared with 2004. In July 2006, the number of dial-up connections used in the course of the previous six months was 330,300.

However, the dial-up figures do not include non-subscription services (i.e. pay-as-you-go), such as provided by Internet Total[91] and Telemedia Home.[92] Dial-up providers typically offer connections at approximately 0.07 Lei (0.004 Euro) per minute in urban areas and 0.084 (0.05 Euro) elsewhere.

The average installation cost for a broadband connection decreased from 60 US$ to 25 US$ (49.5 Euro to 20.66 Euro) and the average monthly cost decreased from 27 US$ to 20 US$ (22.3 Euro to 16.5 Euro) for a downstream speed of 256 Kbps**.**

ADSL is the predominant broadband Internet technology. Other Internet access services available in Moldova are Wi-Fi, cable and GPRS. As of July 1 2006, the number of GPRS/EDGE connections exceed 344,600. According to ANRTI, 16 providers were offering broadband services in Moldova on 31 December 2005. Moldtelecom controlled just 6.2 percent of the ADSL market at the end of 2005, with its main competitors being Sun Communications[93] (30.3 percent - 1,345 connections), Starnet[94] (34.1 percent - 1,515 connections) and Globnet[95] (15.3 percent - 680 connections).

---

[88] These statistics can be accessed at http://www.statistica.md/dates.php?lang=en&ct=22

[89] Based on Ministry of Information Development figure 10.27% PC penetration rate.

[90] Use of Information and Communication Technologies by the population of the Republic of Moldova

PREPARED BY: Centre of Sociological, Politological and Psychological Analysis and Investigations CIVIS, FOR: UNDP Moldova, Programme „Building e-Governance in Moldova" Chisinau 2005

[91] http://www.moldtelecom.md/services/internet/total/en.html

[92] http://www.telemedia.md/internet_home.html

[93] http://www.suncommunications.md/en.html

Moldtelecom announced free connection to its MaxDSL services between 13th April 2006 and 1st June 2006 for all legal and natural persons without any usage limitations. As result of the campaign, on July 1 Moldtelecom reported 5,220 ADSL connections and other operators reported 5,701 ADSL connections. These figures represent a rapid increase of the number of Moldtelecom ADSL connections and its share of the market. The total international capacity of Moldtelecom is 465 Mbs to Frankfurt and Vienna via optical cable.

Overall, there has been a significant increase in the number of Internet access providers: In 2004, there were 48 ISPs overall, with 15 providing services in rural areas compared with 68 overall and 35 in rural areas in 2005.[96] In addition, 336 companies were registered, as of 1 September 2006, to provide Internet access services in public places (such as in town halls), 53 of them were active in rural areas[97].

Total investments in data transport services in 2005 stood at 68.9 million Lei (4.436 million Euro) compared with 24.2 million lei (1.6 million Euro) in 2004 . Of this figure, 70 percent were made by state owned companies: Moldtelecom (68 percent) and Molddata (32 percent). The largest investment made a by private company was 4.2 million Lei (0.27 million Euro) invested by Starnet.

In the first half of 2006, revenue from data transport totalled 87,37 million Lei (5.62 million Euro).

On 1 September 2006, 680 companies were authorised to offer information technology services. In 2004, 159 companies held authorisations to offer information society services, including 72 that were authorised to offer data transfer services via land networks and/or VSAT, and 50 more to offer IP-telephony services.

The growth in investment and expansion of the data transfer and Internet access sector has resulted in a rapid increase in the number of Internet users. This number grew from 0.3 to 17.4 users per 100 inhabitants over the period of 1997 to 2004. However, the Internet penetration rate is still low in Moldova compared with the EU average.[98]

Internet Access Cost (month)

Internet access : Starnet[99]	Price
ADSL "Home Unlimited" o Daytime Speed 256kbps (8am to 8pm) 256kbps o Night time Speed 400kbps (8pm to 8am) 400kbps	
• Connection Fee	49 Euro
• Monthly Fee	20 Euro
• Additional price/mb	0.40 Euro
Dial-up	

[94] http://www.starnet.md/

[95] http://www.globnet.md/

[96] Data provided by ANRTI on 7 July 2005

[97] ANRTI press release of September 20, 2006

[98] These data are from various sources: the Statistical Department, the UN- Millennium Indicators Data Base (ITU estimations), and the e-Readiness Report Moldova (2004).

[99] Starnet was chosen as a random example. Prices on Starnet's website (http://www.starnet.md) are in Euro.

• Moldtelecom - Dial Internet Unlimited	$10.0 (8.26 Euro)
• Moldtelecom - Dial Internet (night) Unlimited	$5 (4.13 Euro)

Sources: Moldtelecom and Starnet websites

According to a survey conducted under the National Strategy on Information Society Development, the number of Internet users, accessing the Internet regularly (minimum once a week), reached 406,000 in 2004. This represents an increase of 118,000 since 2003. This growth was based on the introduction of new data transport service providers on the market, and the opening of new public Internet access centres, as well as by active connections of schools to the Internet through the Presidential program "Salt."[100]

5.6 Public Internet Access Points

There were 426 Internet cafés by the end of September 2006. In addition, about 102 PIAPs were established in rural areas and 82 libraries were equipped with computers with Soros Foundation support.

In addition, there were 57 telecentres in the country.

5.7 Wireless Internet Access

There are no licensing restrictions on Wi-Fi in Moldova. There are currently eight Wi-Fi service providers in the country.

[100] Salt (Moldovan for "jump") is a programme to equip schools with IT equipment and access to the Internet

6 AVAILABILITY OF ONLINE SERVICES

The 2005 business survey, showed that 64.9 percent of enterprises used computers in their operations, and 35.5 percent planned to purchase computer equipment.[101] On average, 13.3 percent of individual employee work spaces are equipped with computers. Of the businesses with computers, 76.5 percent use local networks and 29.4 percent use teleworking services via the Internet.

48.8 percent of all companies have access to the Internet, and 82.7 percent of them use the Internet daily. The survey reveals that the number of employees that use computers connected to the Internet is limited to an average of 9 people in the majority of medium-sized companies (from 50 to 249 employees). Several people normally use one (the same) computer with Internet access; therefore the rate of computers connected to Internet in relation to the number of employees is only 6 percent.

The Internet in business is primarily used to look for business-related information (market news, offers, prices, clients, and partners) and as a means of communication (e-mail), and in large enterprises (with more than 250 employees).

The level of Internet use also depends on the type of activity of a business. The percentage of employees using the Internet is higher in high-tech-related sectors (88.2 percent), mass media (100 percent), telecommunication services (92.9 percent), tourism (100 percent), and business services (84 percent).

The most common way to connect to the Internet in the business sector is by dial-up. 52.6 percent of companies (or 39.4 percent of companies connected to the Internet) use dial-up, whereas 11.7 percent and 21.7 percent of companies use ISDN and ADSL respectively. 39.7 percent of companies are connected via broadband.[102]

As for the circulation of electronic documents, the survey revealed that:

- 30.1 percent of respondents have received orders via the Internet;
- 36.5 percent have accessed public agencies' websites;
- 40 percent of companies that use Internet have their own web page;
- 23.1 percent have obtained information in electronic form.

Other types of interaction with public agencies via the Internet are seldom used.

[101] *Use of Information Society Technologies in Business of the Republic of Moldova* . Prepared by the: Centre of Sociological, Politological and Psychological Analysis and Investigations CIVIS, FOR: UNDP Moldova, Programme „Building e-Governance in Moldova" Chisinau 2005

[102] *Use of Information Society Technologies in Business of the Republic of Moldova* PREPARED BY: Centre of Sociological, Politological and Psychological Analysis and Investigations CIVIS, FOR: UNDP Moldova, Programme „Building e-Governance in Moldova" Chisinau 2005

6.1 E-Commerce

The Ministry of Economy and Trade (MET) has started preparation of a new normative act on electronic commerce. MET specialists affirmed that future normative act will exempt companies from requirements to submit a large number of documents to fiscal bodies and will considerably simplify a range of other bureaucratic procedures.[103]

As e-commerce is still in the early phases of development in Moldova, there is very little data available as yet with regards its growth. There are no statistics regarding the approximate turnover of e-commerce divided between B2B and B2C. However, as an indication of growth, the Ournet[104] portal, which is very popular and indexes almost all Moldovan websites, currently lists over 3,370 websites and has registered approximately 20 percent growth per year over the past five years. 52 percent of sites are available only in Romanian and 21 percent offer some or all of their information in Romanian, Russian and English.

A key enabler of e-commerce is the availability of electronic payment mechanisms. The number of payments made with bankcards in 2006 constituted 3 percent of all retail sales and paid services in Moldova. As of 1 July 2006, the total number of cards in use was 493,487 of which 13,362 (2.7 percent) were local cards.[105]

FinComBank[106] launched an online municipal services payment system on 15th June 2005 for users of MasterCard and Visa credit cards.[107]

Moldcell also recently launched a WAP banking service for clients of Telebank.[108]

Ecentru-com[109] S.A. is developing Internet retail outlets in partnership with Ritlabs and S&T Mold companies. One of the main information partners of Ecentru-com is Zingan.com with its portal www.allmoldova.com. In partnership, they have created a range of Internet shop windows such us Bosch (housekeeping equipment), RevelComputers (computers), Sanin (polymer tape), Uniflux-line (data transport technology), AccentTehno (computers, housekeeping equipment), AGEPI (industrial rights protection), FedEx (express mail services), and Infotag (news agency).[110]

According to the .md registry, 470 new domain names were registered in .md as of 1st March 2005, when the price for domain name registration was reduced by 10 US$. The price for domain name registration now stands at 49 US$ (40.50 Euro) per year or 39.95 US$ (33 Euro) per year for a 10 year subscription. For domains “com.md”, “co.md”, “org.md” and “info.md” the price is 24 US$ (19.83 Euro) per annum. The total number of .md ccTLD

[103] Chişinău, 3 oct./MOLDPRES/

[104] http://www.ournet.md/

[105] Raport:Indicii activitatii in cadrul sistemului de plati cu carduri bancare din Republica Moldova pe semestrul I 2006, http://www.bnm.md/md/docs/cs/89_5249.pdf (Report: Indicators of the activities in the banking cards payment system in the Republic of Moldova for semester 1 2006)

[106] http://www.fincombank.md/homee/

[107] http://www.fincompay.com

[108] http://www.moldcell.md/eng/Services/Payments/Wapbanking

[109] Telematic service provider, http://www.e-centru.md/e-centru/Main.aspx

[110] Sergey Moiseev, http://www.cominfo.md

registrations as of November 2006 was 10,400 according to Molddata, the national ccTLD registrar.

The majority of websites in Moldova present information in the official state language, Romanian. The Government institutions' sites also make 70 percent of information available in Russian and 30 percent in English. As a rule, the written mass media, radio and TV companies present information on their websites in the language in which they broadcast (or write in the case of newspapers). More than half (55 percent) of the news agencies publish information on their pages in 3 languages: Romanian, Russian and English. 90 percent of the information by the news agencies Reporter.md,[111] Basa Press[112] and Infotag[113] is translated into Russian and English. The agency Noutati Moldova[114] presents information in Romanian and in Russian. The news agencies GP Flux[115] and Deca-Press[116] present information only in Romanian (as at February 2006).

A perceived lack of local language content is holding back growth in Internet use. Besides local news, which is readily available, other local content, such as analytical articles, scientific materials and e-learning content, with a few exceptions, is scarce. The Technical University of Moldova[117] is now in the process of posting all professors' lectures on the University Departments' web pages.

However, the same language is used in Moldova and Romania, which opens the possibility to access Romanian web resources. Also, the second spoken language, Russian, creates an opportunity to access Russian web resources. Young people in Moldova can generally also speak English and French, which again opens the door to additional web resources.

6.2 E-Government

67 percent[118] of public institutions offer online information regarding their services, role and activities. Information regarding the legal framework is also available.

The UNDP, with finance from the Soros Foundation and the Government of Japan, is developing an e-government project – Building eGovernance in Moldova – in cooperation with the Ministry of Information Development. This involves an assessment of the current situation (Technical Audit of Public Administration Offices Information Systems (Central and Local)), an analysis of ICT usage in the decision making process, training of civil servants (in cooperation with the e-Government Academy of Estonia) and the development of an overall concept for the development of e-government.

[111] http://www.reporter.md

[112] http://www.basa.md/

[113] http://www.infotag.md/news_ro_2/

[114] http://newsmoldova.md/

[115] http://flux.press.md/

[116] http://www.deca-press.net/

[117] http://www.utm.md/en/

[118] Presence and content of websites in the Republic of Moldova, prepared by the Centre of Sociological, Politological and Psychological Analysis and Investigations – CIVIS - in collaboration with Association DNT, for the UNDP-Moldova, Programme "Building e-Governance in Moldova," Chisinau 2005

Within this project, the following initiatives had been completed by November 2006:
A. Policy Support:
1. A Technical Audit Report and Feasibility Study on use of ICT in Public Administration,
2. Four Surveys on ICT use: Household Survey, Business Survey, Web Presence Survey Internet Users Survey.
3. An e-Governance Concept[119] and e-Governance Portal Concept

B. Training
1. The Vision on Training of public servants in ICT (concept paper on how ICT training should be organised and the content of curricula for training courses)
2. An analysis of legislation and proposals for changing current laws
3. National Certificate on Computer Operation manual (textbooks and software for evaluating ICT expertise among public servants).
4. Methodological Norms on training and certification of Public Servants including a curriculum for training of public servants in ICT

C. Electronic Services
1. The tender for choosing the company that will built the e-Tax Declaration Portal & Information System,
2. Technical Requirements for development of the Central eGovernance Portal,
3. Technical Requirements for the eGovernance Gateway,
4. Standard Requirements regarding official web-pages of Public Administration Authorities on the Internet[120],
5. A draft Regulation on Interoperability of Public Authorities in the Process of Providing of Electronic Services,
6. E-governance Visibility Strategy "Acces@m Moldova".

The findings of the Technical Audit are listed in the table below[121]:

E-Government Site Activity in Moldova

Name of institution	Average number of visitors per day
Official Page of the Republic of Moldova	500
Ministry of Information Development	259
State Fiscal Service	130
Agroindustrial Agency "Moldova-Vin"	117
National Bureau for Statistics	80
Ministry of Energy	55
Agency for Material Reserves, Public Acquisitions and Humanitarian Aid	54
Official Page of the Government	50

[119] Government Decision No. 733 of 28 June 2006 regarding eGovernance Concept; Monitorul Oficial of the Republic of Moldova nr.106-111/799 of 14.07.2006

[120] Minister of Information Development Order nr. 99 of 08.08.2006 (http://www.mdi.gov.md)

[121] Technical Audit of Public Administration Information Systems (Central and Local) and the analyses of ICT usage in decision making process in the Public Administration undertaken by S&T Mold within the UNDP Project "Building of eGovernance in Moldova", Chisinau 2006

Moldova's Ministry of Defence	50

The Technical Audit showed a big gap in ICT/Internet access and use between urban and rural public administrations.

The Technical Audit also showed that 36.5 percent of enterprises with access to the Internet access government websites. At the same time, only 23.1 percent of enterprises with access to the Internet download forms from government websites, and only 20.1 percent use the Internet to deliver fiscal reports and bills to state bodies.[122]

Various measures have already been taken to boost e-government deployment, including the launch of a new government portal,[123] increased use of video-conferencing by government, the increased computerisation of government, increased connectivity (using fibre-optic connections) between government bodies, and the use of cryptography for secure connections between government offices. The 1994 law on the publication of official acts was updated in March 2006 to include obligations to have relevant documents published on the government website. In line with new domain name registration rules in Moldova, the Ministry for Information Development has moved to www.mdi.gov.md.

Further developments include an advanced customs informatisation system for monitoring imports and exports (part of an 8-country project and in line with EU policy). The project is being financed by the World Bank.

A pilot project for a "one-stop shop" for business permits was launched in the Cahul rayon (district) permitting low cost, efficient, transparent and rapid provision of permits. A second similar service in Hincesti rayon for planning authorisations has reduced the time taken for requests to be processed from over one year to less than one month. It is expected that there will be at least another ten such systems up and running by the end of 2006.

The website www.justice.md was launched in February 2006 as a central online resource for Moldovan legislation.

The Ministry of Information Development will develop an action plan to create a centralised database which will include information on all state registers of the state institutions of the country.[124]

The Central Commission for Elections approved a Concept on e-Voting. According to the Concept, citizens will be able to vote from everywhere in the world. The system will be implemented gradually until 2013.[125]

[122] Use of Information and Communication Technologies by the population of the Republic of Moldova prepared by: Centre of Sociological, Politological and Psychological Analysis and Investigations CIVIS, FOR: UNDP Moldova, Programme „Building e-Governance in Moldova" Chisinau 2005

[123] http://www.gov.md

[124] http://www.cominfo.md/rom/itnews/3067/

[125] http://www.moldova-suverana.md/index.php?subaction=showfull&id=1160062899&archive=&start_from=&ucat=6&

6.3 E-Health

E-Health is coordinated in Moldova by the Ministry for Information Development, which has integrated this policy area into the wider national programme for the development of the information society. The Ministry stated in April 2006 that there are "*generally low levels of IT use in public medical institutions*",[126] and has identified the receipt and dissemination of information, training of medical staff, and improving transparency of the activities of public medical institutions as core e-health benefits. For the moment, the use of communications technologies in Moldova involves linking agencies and the central government, rather than linking agencies themselves or agencies and the wider public.

There are increasingly more sophisticated health-related online resources in Moldova. For example, the information system iMED provides information in the following fields (in five difference languages):

- Almost 4,000 types of medicines registered in Moldova;
- Descriptions of about 250 of the most common illnesses and their characteristic symptoms;
- Medical sector news;
- Presentations of new products and treatment;
- Medical legislation;
- Links and references to useful information sources;
- Forum for discussion, etc.

A private gynaecological office Nicolae Tafuni[127] – helps citizens, particularly the young and families, to deal correctly with the multitude of information on sexual health issues and recommends different specialists.

The National Scientific and Practical Centre for Preventive Medicine[128] issues press releases and publishes a monthly newsletter on relevant topics for doctors and the wider public.

The Codex Alimentarius Program in Moldova[129] has a web page administered by the National Codex Committee, the committee that acts as a central coordinator for issues related to the quality and safety of food products.

The NGO AVE-Natura[130] presents information on its website about the influence of the environment on health. The website was developed with financial support from IATP.

The European Union (as part of the external assistance programme to Ukraine, Belarus and Moldova) provided a set of 350 computers and 4 servers to medical institutions in Chisinau and Orhei as part of the Project of Public Health Reform.[131]

[126] Grimut, A, "E-Health in Developing Countries – Moldovan Experience", Ministry of Information Development, April, 2006

[127] http://cspms.mednet.md/sexologie/

[128] http://sanepid.design.md/)

[129] http://www.codex.sanepid.md/)

[130] http://www.iatp.md/mediu-sanatate/

[131] Source: 12.10.2006 - [DECA-press]

6.4 E-Learning

Special ICT training is increasingly being provided in schools, which should help boost computer literacy and e-commerce trust. On 1 September 2005, there were 114,552 students enrolled in institutions of higher education (approximately 300 students per 10,000 inhabitants). There are 95,221 students in state institutions, and 19,330 in private institutions. Special ICT training is provided to 6,212 students in state universities and 1,063 students in private universities.

The first step of the "SALT" Programme, which is a Presidential programme to equip schools with ICT equipment and access to the Internet, was to install 6,000 computers to enable ICT training. However, despite the efforts made by the "SALT" programme, targets have not yet been achieved.[132]

The progress that has been achieved in this area so far includes:[133]
1. The development of the Concept of the Educational Informational System.
2. Each school (almost 1,551) has at least one computer that is connected to Internet.
3. 256 ICT instructers have been trained. These will train other teachers from all schools of Moldova on basic ICT.
4. The Centre for Information and Communication Technologies in Education has been created.
5. A software package has been piloted for 4 disciplines (Mathematics, Chemistry, Physics, etc.) in Calarasi. The e-learning software, together with the services of trainers, was brought from Romania.
6. An information system has been created to monitor the developments in the sector on the basis of a number of statistical indicators. The information in the system is updated automatically through a web interface and connects all schools in Moldova.

The current plans of the Ministry of Education and Youth include:

1. Developing eight pilot model schools where computer classes will be created for computer science teaching and also for laboratory work in other disciplines.
2. Developing the Centre for ICT in Education to maximise use of its facilities (currently it operates at 50% capacity)
3. Rolling out the training of teachers in basic ICT (through the network of 256 teachers)
4. Developing the Educational Informational System

In the context of the SALT programme, every pre-university institution has concluded a contract with Moldtelecom for Internet access provision. Moldtelecom was obliged by the Government to build the connections. In order to ensure the sustainability of the project, it is obviously important that the state budget for 2007 include financing of Internet connections of schools..

From June to October 2005, a range of videoconferences were held by the Minister of Education and Youth with the heads of the rayon (regional) departments of education and

[132] Source: Ministry of Education

[133] Idem

the Moldtelecom representatives responsible for “SALT” programme implementation, possibly indicating the extent to which the government is prioritising this programme.

120 computers have been installed in 20 of the 38 rayon (district) departments for education. In 28 rayon education departments a member of staff with responsibility for IT development has been appointed.

A further 30 schools in Moldova are equipped with computers sponsored by Goodwill Industries[134] through the North Carolina State University, USA.[135] According to Sun Communications,[136] which initiated the programme that will bring 283 computers to Moldavian schools, the schools will be selected by Sun Communications, the Ministry of Education, and the Office for Bilateral Relations of the European Committee of the United States Army and of the National Guard of North Carolina. All the schools will be connected to the Internet free of charge by Sun Communications. In 2003, Sun Communications also developed a social programme, Sun Schools, which aims to ensure access to modern information technology training facilities for young people. The programme includes three projects: Sun Classroom, Sun Scholarship and Sun Internship. In September 2005, the German Federal Ministry of the Economy and Labour sent 500 computers (as well as 144 processors, 218 monitors and 95 printers) to Moldova on behalf of Germany.

The Information Technologies and Education Communications Centre (CTICE) has been inaugurated in Chisinau within the presidential SALT programme. The centre aims to ensure the efficient implementation of the SALT information programme, and to contribute to improving the quality of education in Moldova.

[134] http://www.goodwill.org/

[135] Basa Press

[136] http://www.suncommunications.md/

7 STRUCTURE OF THE COMMUNICATIONS INDUSTRY

The contribution of the ICT sector to GDP was 10.6 percent in 2005.

The total revenue of the electronic communications sector in 2005 was 3.64 billion Lei / 234.36 million Euro. Moldtelecom represents by far the largest part of this figure, with 1,968 million Lei (128 million Euro) in revenue. The total market share by revenues of state owned enterprises in 2005 was 54.95 percent - that represents a fall compared with 65.7 percent in 2004.

Total investment made by ICT companies in 2005 reached 416.4 million Lei / 26.8 million Euro (fixed telephony, 193 million Lei / 4.46 million Euro - 46.3 percent; mobile telephony, 204 million Lei / 13.13 million Euro - 49 percent; and data transport and Internet, 19.4 million Lei / 1.24 million Euro - 4.7 percent). With regard to investment in data transport and Internet, 70 percent of investments were made by state owned companies: Moldtelecom and Molddata.[137] Moldtelecom investment represented 68 percent (13.2 million Lei / 0.85 million Euro) of the total.

According to the provisions of the Telecommunications Law, only registered Moldovan companies can provide telecommunications services in Moldova. Therefore there are no completely foreign companies on the market. However, foreign companies and natural foreign persons can own shares in mobile operators, cable television operators and ISPs. Private companies (mobile, ISP, VoIP, Cable TV) make up around 34.3 percent of the communications market by revenue.

The three leaders in the Moldovan electronic communications services market are Moldtelecom,[138] Voxtel[139] and Moldcell.[140] Although these companies control a significant portion of the market, many smaller companies such as Sun Communications,[141] Telemedia Group,[142] Arax Impex,[143] Globnet,[144] Telcom Technologies,[145] Riscom,[146] StarNet[147] and others are currently increasing their market shares. Moldtelecom had a monopoly on fixed line network and services until the end of 2004, when the market was opened by the Telecommunications law's provisions and in accordance with Moldova's WTO commitments. Although the monopoly of Moldtelecom has ended from a legal point of view, the Moldovan ICT sector continues to be dominated by this 100 percent state owned company.

In 2005, 17.08 percent of international voice traffic was registered as VoIP traffic. Out of this figure, the share of the 14 Moldtelecom competitors in the international VoIP market was

[137] http://www.molddata.md

[138] http://www.moldtelecom.md/

[139] http://www.voxtel.md/

[140] http://www.moldcell.md/eng/

[141] http://www.suncommunications.md/

[142] http://www.telemedia.md/

[143] http://www.arax.md/

[144] http://www.globnet.md/ru.html

[145] http://www.telcom.md/

[146] http://www.riscom.net/

[147] http://www.starnet.md/

8.13 percent of total international voice traffic, which was less than that of Moldtelecom, whose share was 8.95 percent. Moldtelecom's high market share in the international IP-telephony market segment is mostly a result of its vertical integration. Possessing access and transport infrastructure, as well as a well-developed payment-collection system, Moldtelecom has the possibility to offer post-paid services, which are billed together with other telephony services.

International VoIP traffic grew in 2004 by 4.33 million minutes or by 29.3 percent against the 2004 level; while the traffic of traditional international calls increased in the same period by 9.95 million minutes or by 12.01 percent.

As mentioned above, the total revenue of the telecommunication sector in 2005 was 3.64 billion lei (234.36 million Euro). The market share of fixed telephony was 51.56% (with a growth rate of 27.31%).

The total revenue of fixed telephony in 2005 was 1,968 million lei (128 million Euro). The market share of mobile telephony was 37.44%. Revenues from mobile telephony services rose by 52.4 percent up to 1.362 billion lei (87.1 million Euro). The total revenue of leased lines and Internet access services was 130.5 million lei or 3.59% of the communications market share, increasing by 35.23% compared with 2004.

3,370 websites were registered on www.ournet.md, the largest directory of Moldovan websites, on April 2006 compared with 3,002 websites in 2005 (12.25 percent growth compared with April 2005).

Following a Government decision, the state enterprise Radiocomunicații will be reorganised as a Joint Stock Company. This is partially to ensure roll-out of digital radio and TV services in the course of the next five to seven years.[148]

7.1 Fixed Networks

The state-owned company Moldtelecom has a 99.5 percent share of the fixed line market. The new entrants account for the remaining 0.5 percent. .

State owned enterprises revenues in 2005:

JSC Moldtelecom -1,968.5 million lei (770 million Euro), with investments of 677.7 million lei (45.63 millon Euro) (99.3% of all state-owned enterprises' investments),
Radiocomunicatii -28.08 million lei (1.8 million Euro), investments 10.9 million lei (0.7 million Euro),
Molddata -2.498 million lei (0.16 million Euro), investments 0.405 million lei (26,000 Euro.

The total market share by revenues of state owned enterprises in 2005 was 54.95%, down from 65.7% in 2004. The amount of government owned companies' investment was 689.05 million lei (44.36 million Euro) or 56.4%.

[148] Source : #1821* 05.10.2006 - DECA-press

The growth of total investments in the sector in 2005 was 41.33%. The share of private investments in the sector was around 43.6% of 1,221.3 million lei (78 million Euro) compared with 41% of 883 million MDL (58.85 million Euro) in 2004.

Little progress has been made in the course of the last year regarding the privatisation of Moldtelecom and the issue appears to be less of a priority than it previously was.

7.2 Mobile Networks

The first mobile operator in the Moldovan market, Voxtel, is owned mainly by foreign and private investors. France Telecom Mobiles (FTM) the major shareholder holds a 51 percent stake, Moldovan Mobile Telephone-Bis owns 30 percent, IFC (which is the private sector arm of the World Bank Group) owns 5 percent, and MobilRom (Romania) owns 4 percent. The France Telecom Group has bought the 10% stake that JSC Moldtelecom held,, boosting its share to over 60 percent. On April 19, 2006, Voxtel shareholders decided to re-brand the company “Orange”. The Orange trade mark is expected to consolidate the leadership of Voxtel on the market.

The other mobile operator, Moldcell, is owned by Fintur Holding B.V. (Holland) as the majority shareholder, with 99 percent, and Moldfintur LLC (Moldova) with 1 percent.

The growth of total investment in the sector in 2005 was 41.33%.The share of private investments in the sector was around 43.6% of 1,221.3 million lei (78.63 million Euro) compared with 41% of 883 million MDL (53.6 million Euro) in 2004.

The share of the telecoms market held by mobile operators (by revenue) in 2005 was 37.44 percent.

7.3 Cable Networks

The main cable operator in the Chisinau area is Sun Communications, a Moldovan-American private company (Moldovan share 35 percent; USA 65 percent). Another cable operator is Alternativ-TV, which is a private company (20 percent held by Moldovan investors and 80 percent by foreign players).

The market share of cable TV services was 2.5 percent in 2005.

7.4 Internet Access Providers

The State plays a relatively small role in the ISP market and only has a stake in one (out of about 25 significant players in the market) ISP, Moldpac S.A.[149] (24 percent is owned by Moldtelecom). Private citizens own about 90 percent of the shares in ISPs.

7.5 Satellite Operators

The market share of satellite services is very small: only two or three companies offer such services.

7.6 Production of IT Services

In the late 80s, hardware and software producers employed over 50,000 specialists. According to Ministry of Economy and Commerce, the number of employees in the IT industry was 12,500 persons in 2004, which was 2.4% of all employees. Activities in this sector were concentrated on hardware production (analogue devices, integrated circuits, PC assembly, etc.) and software development to order. During 1991 – 2000 many specialists had to emigrate or to leave the sector. Today the situation is improving slightly. Many state and private universities train ICT specialists. Over 1,200 highly qualified specialists were trained in 2003 (750 in 2002) representing a relatively high annual growth rate. The number of companies offering various IT services is steadily growing, while number of companies specialising in software and supporting services is in stagnation.

There is no full statistics available for the IT services such as software development and export. Some evaluation of the market size can be found in the MEPO study.[150] That study estimated the market to be worth 17.3 million USD (14.3 million Euro) for the year 2002. The turnover of the software related products and services was 13.4 million US$ (11 million Euro), which was 77% of the total IT sector. The biggest part of this figure belongs to the database development. Pure software production has sales of only 3.5% from the total ICT sales.

The market size and its trends cannot be analysed properly due insufficient official statistics. There are currently 32 companies registered, of which 21 are relatively active. The total volume of their production was 619,000 US$ (511,600 Euro) in 2002, while export of this service amounted to 728,000 US$ (601.7 Euro).

[149] http://www.moldpac.md/en-index.shtml

[150] Market Study of the Informational Software Technology Sector in Moldova Prepared by Moldovan Export Promotion Organisation (MEPO) for BIZPRO-Moldova, January 2004

7.7 Financial Development of the ICT Sector

"Assessing Competitiveness In Moldova's Economy",[151] a study conducted for USAID, BIZPRO[152] and Development Alternatives,[153] Inc., estimates that 70-90 percent of ICT activities are conducted in the black economy. As the largest impediment to growth in the ICT sector, the black economy has two significant consequences for the ICT industry. First, the black market creates a disincentive for companies in Moldova to produce software for local consumption: the low cost of pirated software drives the price of products so far down that Moldovan companies are not able to recover their development costs or make a profit. Secondly, and perhaps more importantly, the black economy is a major deterrent to foreign direct investment.

[151] "Assessing Competitiveness in Moldova's Economy", USAID, BIZPRO, Development Alternatives Inc, July 2004

[152] http://www.bizpro.md/

[153] http://www.dai.com/