

---

*Support for Broadband Competitiveness Programme in  
Eastern Europe, South Caucasus and Central Asia (ECA)*

**Selection #1019083 – Trust Fund: TF071399  
Creating Sustainable Businesses in the Knowledge Economy**

**Report 2: Western CIS  
Focus Country: Moldova**

Written by Judith Hellerstein  
Revised January 10, 2012

Delivered to the  
**Annenberg School for Communication  
The University of Pennsylvania**

## Index

<b>1. Introduction .....</b>	<b>1</b>
1.1 Methodology .....	1
1.2 Importance of ICT and e-Leadership to Economic Development .....	1
1.3 Defining broadband.....	5
1.3.5 Defining broadband .....	5
1.3.6 Why broadband: the broadband bonus .....	5
1.3.7 The broadband ecosystem.....	6
<b>2. Diagnostic and analysis.....</b>	<b>7</b>
2.1 Region focus: Western CIS.....	7
2.1.5 Economy .....	7
2.2 Mobile and Fixed Broadband.....	7
2.2.3 Mobile Data and Other Value Added Services and Applications.....	8
2.2.4 Telecom and Broadband Infrastructure (Mobile and Fixed) .....	9
2.3 Investment Climate in the Region .....	11
2.4 ICT policy, regulatory framework and institutional diagnostic.....	13
2.5 Country focus: Moldova .....	15
2.5.1 Economy .....	15
2.5.2 ICT and broadband sector .....	17
2.5.3 Telecom and Mobile Infrastructure.....	18
2.5.4 ICT policy, regulatory framework and institutional diagnostic.....	20
<b>3. Key issues to be addressed in curriculum development and training.....</b>	<b>23</b>
3.1 Focus on training for public officials.....	23
3.2 Focus on academic programmes for students .....	25
<b>4. Conclusion .....</b>	<b>26</b>

## Abbreviations

3G	Third Generation
4G	Fourth Generation
ACC	Moldova’s Audio Visual Coordinating Committee
ADB	Asian Development Bank
ADSL	Asymmetric Digital Subscriber Line
ANRCETI	National Regulatory Agency for Electronic Communications and Information Technology
ARPU	Average Revenue per User
B2B	Business To Business
CAD	Caucasus Analytical Digest
CIA	Central Intelligence Agency
CDMA	Code Division Multiple Access
DGO	German Association for East European Studies
DSL	Digital Subscriber Line
EBRD	European Bank for Reconstruction and Development
ECA	Eastern Europe, South Caucasus and Central Asia
EDGE	Enhanced Data Rate for GSM Evolution
ENP	European Neighborhoods Policy
EVDO	Evolution Data Optimized
FDI	Foreign Direct Investment
FTTX	Fiber to the X (curb, pedestal, etc)
GDP	Gross Domestic Product
GICT	Global Information and Communication Technologies
GNCC	Georgian National Communications Commission
GNI	Gross National Income
Gpbs	Gigabytes per second
GPRS	General Packet Radio Service
HSDPA	High Speed Downlink Packet Access
HSPA	High Speed Packet Access
HSPA+	Evolved High Speed Packet Access
ICT	Information and Communication Technology
IMF	International Monetary Fund
IP	Intellectual Property
Kbps	Kilobytes per second
LTE	Long Term Evolution
Mbps	Megabytes per second
MCIT	Ministry of Communications and Information Technologies
NFRC	Moldova’s National Frequency Radio Commission
PPP	Purchasing Power Parity

PSRC .....	Public Services Regulation Commission
SME.....	Small and Medium Enterprise
SMP.....	Significant Market Power
UN .....	United Nations
UNDP .....	United Nations Development Programme
USD .....	United States Dollars
VAS.....	Value Added Services
WB .....	World Bank
WiMAX .....	Worldwide interoperability for Wireless Access
WTO .....	World Trade Organisation



Chart 1. Map of Western CIS: Belarus, Moldova, Ukraine<sup>1</sup>

---

<sup>1</sup> Sourced from <http://ukraine.usaid.gov/>

<b>Socio-economic indicators of Western CIS countries</b>	<b>Belarus</b>	<b>Moldova</b>	<b>Ukraine</b>
Population (mil)	9.6	3.6	46
Labor Force (mil)	5	1.5	23
% Urban Population	74	41	68
No. of Households	3.1	1.2	18.9
Education Level	90	68	91
Paved Roads	88.6%	85.8%	97.8%
GNI (WB)	5560	1560	2800
GDP PPP per capita	8.4		
Inflation	12.9	(-1)	15.9
GDP Composition (Agric./Ind./Services)	9.6/42.5/47.9	10/12.9/77	8.2/29.4/62.4
Private Foreign Direct Investment	3.8	2.4	4.2
Investment in infrastructure w/private participation (millions)	833	117	1,118
Unemployment	NA	6.4	8.8
Ease of Doing Business (ranking 1-183, 1 is best)	68	90	145
Government Debt (% of GDP)	18.1	24.4	NA
Government Surplus/Deficit (% of GDP)	.2	(-5.7)	(-5.6)
\$ Exchange Rate	2789.5	11.1	7.8

Source: based on data from The World Bank, Little Data Book 2011 series, ITU; data is 2009 unless otherwise noted (estimates indicated with an asterisk)

Table 1. Socio-economic indicators of Western CIS countries

## *Support for Broadband Competitiveness Programme in Eastern Europe, South Caucasus and Central Asia (ECA)*

### Report 2: Western CIS – Focus country: Moldova

## 1. Introduction

This is the first of three reports as part of the 2010-2012, InfoDev programme "Creating Sustainable Businesses in the Knowledge Economy" in support for the broadband competitiveness programme in Eastern Europe, South Caucasus and Central Asia (ECA).

The overarching goal of the programme is to increase the productive capacity of SMEs in developing countries to compete effectively in today's global knowledge economy and contribute to sustainable development.

### **1.1 Methodology**

Each report has these two main parts:

- i. Diagnostic and analysis combined.
  - a. A regional macro perspective
  - b. A country focus, more specific
- ii. Identification of areas for training
  - a. For government officials
  - b. For academic course for students

### **1.2 Importance of ICT and e-Leadership to Economic Development**

Leadership, institutions and human capabilities are the key to moving countries from visions of the potential of the ongoing information and communication technology revolution to real competitive, innovative and knowledge-based economies. Increasingly, powerful, flexible and economical ICTs present formidable new opportunities for social and economic integration. Achieving the promise of ICTs does not require sacrifice on the part of business and government, but it does demand vision, cooperation, and action to create the policy environment and regulatory mechanisms necessary for ICTs to flourish, especially in hard-to-reach rural areas.

Information and Communications Technologies (ICTs) play a key role in assisting developing countries in driving economic growth by promoting more efficient functioning of markets; creating new income-generating opportunities; improving the delivery of public services to

make them effective, transparent, and efficient. ICT thus plays an essential role in poverty alleviation by providing powerful tools to achieve these goals and objectives.

ICTs are increasingly becoming the key drivers for socio-economic growth worldwide. A country's ability to accelerate its economic development process and gain global competitiveness and improve the well-being of its people depends on the extent that it can develop, use, and sell ICT in one form or another. Access to ICTs, particularly broadband Internet services, in rural areas and poor urban neighborhoods of many developing countries remains substantially lower than in metropolitan urban areas. Examples abound from the farmer or the fisherman who use the cell phone to identify the market where he can obtain the best price for his products, to the school-based rural community telecenters being used for adult literacy programs.

ICTs can and should play a significant role in driving strong regional development and integration in today's digital economy. There is little doubt among developing countries that increased access to ICT infrastructure—the foundation upon which the ICT sector is formed—is a critical engine for trade, growth and competitiveness, as well as a major contributor to poverty reduction. Growth is the single most important driver behind poverty reduction and is a key component of any poverty reduction strategy. Other components are: macroeconomic policy, which sets the framework for all economic activities; trade policy, which determines the costs of exchange both internationally and domestically; educational policy, which influences the capacity of the workforce and financial policy, which determines the access to credit and financial services.

Leadership and institutions are key to integrating and orchestrating this transformation. E-Government or to use the current term, e-Transformation is about an economically, socially, politically, and culturally connected government. One that integrates ICT into all aspects of government reform and into the current ICT strategy for the country or region. It is about leaders who shape expectations and set governance mechanisms to continuously integrate the country's ICT strategy into governance.

It is only by having as many top leaders involved that you can get a cross-sector transformation. Transformation is mostly a social learning process that requires intensive communications of shared visions, goals, objectives, and lessons learned to as broad an audience as possible so that awareness of these goals are wide spread.

Leadership, however, is critical to economic and institutional transformation, including ICT enabled transformation. This leadership is partly exercised by individual leaders, including CIOs and CEOs. It is critically determined by the attitudes, capabilities, knowledge and experience of these leaders. They must inspire and animate strategic investments and plans as well as ICT governance and process transformation. However, individual leaders are not enough; their vision must be institutionalized, and institutional mechanisms must be fashioned to make these visions implementable and sustainable. Good leaders cannot operate effectively without appropriate governance and institutional structures. E-leadership institutions are critical to identifying, attracting, and developing potential leaders and to supporting and empowering them to build the enabling environment for all stakeholders for the knowledge



economy. Building a cadre of e-leaders and of e-leadership institutions is essential measures for e-Government to take hold.

E-Leaders should have a deep understanding of both policy, political organizations and the social impact of ICT and of network based competitiveness. Most importantly they should have a collaborative leadership style and be willing to work with all stakeholders. Great leaders are able to shape the enabling environment, thereby ensuring that the requisites needed along with an investment in the needed skills and processes needed to change are in place so that any investment in ICT will lead to increased innovations and productivity gains. Leaders should instead focus their efforts on learning how to manage workers, organizations and networks and to create open innovative systems and environments so innovation can flourish. ICT projects often fail because the leaders have lacked the necessary understanding of what is needed to restructure the processes and workforce so that this new technology investment will bear fruit.

Leaders need to shape expectations and set governance mechanisms to continuously integrate the country's ICT strategy into governance<sup>2</sup>. National budgets and other ICT investment tools are one good way of accomplishing this objective. Other Agencies in the Government need to follow the leaders steps and also become fully involved in this change management process and in the shaping of the governance institutions and ICT strategies. It is only by having as many top leaders involved that you can get a cross-sector transformation. Transformation is also a social learning process that requires intensive communications of shared visions, goals, objectives, and lessons learned to as broad an audience as possible so that awareness of these goals are wide spread. Building national consensus on the top priorities and vision for the country is essential since without this ownership and buy-in there will not be enough commitment to change on the part of each agency. One way of doing this is through a series of stakeholder forums and discussions. These forums help to broaden and deepen the vision and also ensure that the strategy and vision created is realistic, flexible, sustainable, and responsive to the changing environment and to local needs. Stakeholder forums also provide for opportunities for new partnerships, strengthen the accountability of the participating agencies, especially as it regards efficient use of financial resources, and supports a balanced approach to the reform or transformation of Government.

Commitments and a shared vision that come from these forums helps to secure the necessary resources and government, private sector, and civil society commitment to deliver the changes and resources needed and called for in the strategy/vision. These forums also build momentum and continuity going forward for continued changes and integration of e-Government within the country. This national shared vision should also be linked to the development & industrial priorities and visions of the country.

Leaders also need to create the proper amount of incentives to give to agencies to effect this change and to sustain it over the long term. The strategy also needs to create an institutional framework for coordination between and among agencies, private sector, and civil society.

---

<sup>2</sup> Hanna, Nagy. "From Envisioning to Designing e-Sri Lanka: Joining the Information Services Economy", World Bank, July 2006

This framework is essential for collaboration and for future partnerships and other forms of collaboration between government and industry.

Leaders do not have to be tech savvy to be good, they just need to focus their efforts on creating better governance as that is what is most important. Leaders need to have the ability to combine their leadership skills with collaboration and work towards building coalitions both within the government and with the private sector. Effective leaders will be able to manage expectations and external pressures from all users, both inside the government and outside, e.g., businesses and civil society.<sup>3</sup> Leaders need to create a culture that promote innovation, some ways of doing this are to follow what the US Depart of Interior, Bureau of Reclamation had done in the early 90s by handing out forgiveness coupons which could be redeemed if an innovative idea a line staff or manager tried that failed. Different US Government agencies tried different tactics to encourage bottom-up innovation from permission slips to team-building cards with varying degrees of success. Some of these programs succeeded and got the bottom up innovations that were desired, while many others failed. The agency efforts failed because they failed to change the culture of the agency and the top leaders did not support these initiatives.

According to research from the World Bank, the best and most successful e-Government programs were lead by reformers who had no specialized technical education, but had the ability to emphasize and build skills, attitudes, and knowledge and were able to support and promote collaborative leadership and strategic change management. They were great leaders since they understand the connections and the necessary prerequisites to succeed.

The appropriate level of centralization and decentralization is a key consideration in the design of a national ICT policy. The issue can be framed in three ways:

#### **Integration into development**

- What kinds of institutional arrangements are necessary to promote integration of ICT into development strategy and management?
- What role should be played by the central ministries (Finance, Planning or Economy)?
- How should demand for the new institutions be mobilized and articulated so as to align and integrate ICT strategy with development policy and goals?

#### **Coordination across e-government:**

- How should government organize itself to lead its own ICT-enabled transformation and to deal with the cross-sectoral roles of ICT?
- Beyond, coordination, what incentives and institutional frameworks may encourage collaboration?

#### **Centralization and discretion:**

- How much should the government centralize or decentralize planning and decision making in e-development and ICT investments?

---

<sup>3</sup> Hanna, Nagy. “e-Leadership Institutions for the Knowledge Economy,” World Bank Institute Working Papers 2007

- What is the best way to promote bottom up innovation?
- How can e-leadership institutions enforce this optimal level of e-governance?

### **1.3 Defining broadband**

The main topic to discuss in this paper is the impact of broadband on SME competitiveness. Some questions need to be raised and at least partially analysed (i) what do we mean by broadband? (ii) why to focus on broadband? (iii) a view of the broadband ecosystem.

#### *1.3.5 Defining broadband*

There is no definition of broadband, but rather a number of definitions (ITU, FCC, etc). This makes speaking of broadband problematic, unless we have a point of reference. For example South Africa has a broadband policy to achieve a speed of 256 Kbps by 2019. At the same time South Korea is planning to implement fibre-to-the-premises broadband access with speeds of up to 1 Gbps by 2012. They are both “broadband” but there is a huge difference.

There are at least three important aspects of what good broadband access is: speed, latency and synchronous.

- **Speed.** This is the size of the pipe, in today’s environment, what is fast for a business can be anywhere between 1 and 100 Mbps, depending on what continent you are. One can pay USD 100 for 1 Mbps in one country or USD 20 for 100 Mbps in a different country.
- **Latency.** This is the time it takes for a packet of data to cross a network connection, from sender to receiver, and to return with a response, and is actually paramount to reliability of the connection. Bad latency makes any speed meaningless.
- **Synchronous.** Synchronous connections –meaning same speed and consistent latency for upload and download, permit higher interaction between user and the cloud. This interactivity is at the root of tomorrows highest value yield in the future of broadband use maximisation.

How broadband connectivity is delivered matters, from wireless to ADSL to DSL to fibre optic-to-the-premises. It is a strategic decision for government decision makers. Fibre to the premises has the highest value and potential, while mobile wireless access will continue to be a good second best option.

#### *1.3.6 Why broadband: the broadband bonus*

There are indications from a number of studies that broadband connectivity makes things better for people. This phenomenon has been referred to as the “broadband bonus”, and it refers to findings such as:

- A study by Northwestern University for the period 1999-2006 found that broadband in households are responsible for USD20 -USD22 billion in new revenue. Of this, approx USD 15 billion is newly created value, and between USD 8.3 billion and USD 10.5

billion is new revenue for firms. It estimated that between USD 4.8 billion and USD 6.7 billion is consumer surplus.<sup>4</sup>

- In a study by NextBigFuture, it found that symmetrical bandwidth in excess of 100 Mbps can increase GDP by up to 5%.<sup>5</sup>
- The World Bank has found that in low and middle-income countries every 10% increase in broadband penetration accelerates economic growth by 1.38%.
- A study by McKinsey estimates that a 10% increase in broadband household penetration can boost GDP from 0.1% to 1.4%.<sup>6</sup>
- Another study by Booz found that with 10% higher broadband penetration there is approximately 1.5% more labour productivity over 5 years and up to 2% higher GDP.<sup>7</sup>

### 1.3.7 The broadband ecosystem<sup>8</sup>

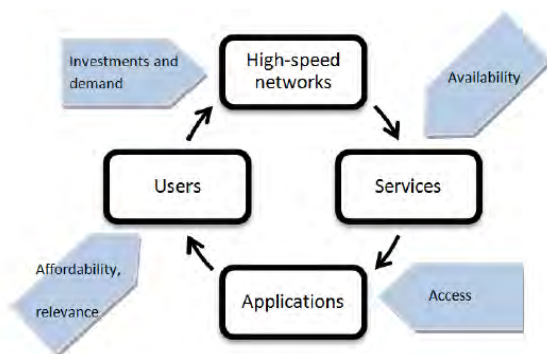


Figure: The broadband ecosystem

Last but not least, the World Bank has introduced the concept of the “Broadband Ecosystem” in their broadband strategy kit. This model proposes a set of relationships that makes sense of broadband Internet: it is the combination of high-speed networks, services, applications and smart users.

In addition, the ecosystem model takes into consideration aspects of availability, access, affordability, which sets the stage for

universality and investment. From a planning and policy making perspective it is an excellent tool for approaching the development of broadband more tactically on a national level.

<sup>4</sup> Shane Greenstein and Ryan C. McDevitt. The Broadband Bonus: Estimating Broadband Internet’s Economic Value. October 2010

<sup>5</sup> NextBigFuture. Ultra-Broadband Worldwide and GDP boost. 09 June 2009.

<sup>6</sup> Yongsoo Kim, Tim Kelly, and Siddhartha Raja. Building Broadband Strategies and Policies for Development. Global Information and Communication Technologies (GICT) Department. World Bank. January 2010

<sup>7</sup> Ibid.

<sup>8</sup> World Bank Little Data Book on ICT & Private Sector Development 2011

## 2. Diagnostic and analysis

### 2.1 Region focus: Western CIS

#### 2.1.5 *Economy*

The economy of the region, and in fact of most of the world, was heavily affected by the 2008 economic crisis, causing anything from a slight to a severe drop in GDP.

The following table summarises the Western CIS countries ICT status.

ICT data	Belarus	Moldova	Ukraine
<b>Fixed Line</b>			
Number of phone lines (000)	4110	1161	12941
Fixed telephone line penetration	43.1%	32.6%	28.5%
<b>Mobile</b>			
Mobile subscribers (2010) (000)	10,113	2762	53811
Mobile penetration	105.4%	77.6	117.59%
Subscribers to mobile 3G internet (000)	730	500	775
Mobile 3G penetration	7.2%	18.1%	1.44%
Number of mobile operators	3	3	4
<b>Internet</b>			
Internet subscribers/users (000)	4,645.3	1,130	10,391
Internet penetration	48.7%	31.8%	22.9%
PC penetration	40.8%	33% (2009)	30.7%
Broadband Internet subscribers (2010) (000)	1,572.1	387	3,661
Broadband Internet household penetration (2010)	16.5%	10.9%	8.1%

Originally sourced from The World Bank Little Data Books, BMI reports for Moldova, Belarus, & Ukraine, Data is 2010 unless noted.

Table 2: Western CIS telecom and ICT data profiles -updated

### 2.2 *Mobile and Fixed Broadband*

The regional report on broadband competitiveness names five key findings:<sup>9</sup>

- i. Level of broadband deployment and use varies significantly across the region,
- ii. Fixed broadband access generally uses Digital Subscriber Lines (DSL) and is limited to urban areas,
- iii. Virtually no fixed broadband deployment exists in rural areas, where nearly half of the populations live,
- iv. Mobile broadband growth and availability have been strong, except in Azerbaijan

<sup>9</sup> Ibid.

- v. Overall urban infrastructure is not the issue, once fixed broadband deployments are taken into account

These findings are not that surprising if we compare with the history of universal access to telephony a decade ago, where services would concentrate in high density urban areas. In all three countries the high cost of Internet access because of telecom regulation slowed down the entry of foreign providers into the market. Over the period 2007-2010, the number of ISPs providing Wi-Fi and broadband connections has been increasing, resulting in price cuts as a result of mild competition and a drop in prices.

The telecoms markets in the Western CIS region remain dynamic in terms of operator rollouts, despite penetration rates of some services, such as mobile telephony, fast approaching saturation. However, many of them are characterized by poor industry rewards resulting from low ARPUs, high rural population and high unemployment levels. Internet penetration has been increasing as carrier's rollout their 3G services and start to lay the ground work for 4G services. Many people lacking a computer rely on their phones for Internet access.

### 2.23 Mobile Data and Other Value Added Services and Applications

Mobile data services continue to grow rapidly in many Central and Eastern European markets, continuing the trend of recent years. This uptake is largely driven by the ongoing rollout of high-speed mobile broadband networks, generally based on variations of 3G technology standards but increasingly will also use next-generation platforms such as WiMAX and LTE.

In the past, cost had long been a major obstacle to the uptake of smart phones and mobile Internet devices in Central and Eastern Europe and, by implication, mobile content associated with such devices. However, this is changing as operators become more adept at moving prepaid customers onto higher-value long-term contracts. With flat-rate plans consumers have become accustomed to using mobile content. So much so that, it is hoped that when customers exceed their limits, they are increasingly willing to pay for additional services and value-added content.

In Belarus, one of its strengths is its relatively young population with a keen interest in mobile technology and communications. Additionally, the three operators in Belarus have a large percentage of their subscribers on contracts rather than as pre-paid customers. As the carriers rollout their 3G data service plans they are finding strong demand for these products from customers and these higher take rates are leading the growth path of the mobile providers. This market will only grow with the continued rollout of local content. The development of value-added data services has formed an important part of the strategies employed by the Belarusian operators to win customers and increase ARPU spending. In addition to basic voice-based features such as call forwarding, caller identification, call barring and conference calling, the mobile operators have pioneered an extensive range of data, video and content-rich mobile Value Added Services (VAS).

All three mobile carriers in Belarus offer mobile banking services over their networks and the same is true for neighbouring Ukraine where the mobile carriers have also been rolling out mobile banking services.

In Moldova, the Mobile Operators are building out their 3G and 4G networks and intend to push and promote a mobile Broadband service. The ongoing deployment of 3.5G HSDPA technology will expand mobile data and internet-based services. Moldtelecom's technology strategy has adopted an ambitious and sound technology architecture that will deliver extra-wide bandwidth connectivity, known as NGA (Next Generation Access). This Broadband service will avail the average customer will services at speeds of more than 25-30Mbps and even speeds up to 50Mbps. The core technology is a modern NGN (Next Generation Network) environment built on their nation fibre network with the capacity to deliver software defined high value services efficiently.

#### 2.24 Telecom and Broadband Infrastructure (Mobile and Fixed)

The Moldovan electronic communications market was liberalized in 2004. The liberalization process appears to have been a big bang approach, with unclear rules of engagement for new players interacting with the incumbent Moldtelecom. During this period Moldtelecom responded as all incumbents by making interconnection and interoperability a difficult process for the many new entrants.

There are three mobile operators, Orange, Moldcell, and Unite. At the end of 2010 there were 2.76 million mobile customers, equivalent to a penetration rate of 88.8%. However, despite solid growth in the number of subscribers, Moldova's mobile penetration rate remains the lowest in the region. Although mobile networks provide near national coverage, the take-up of mobile services in more remote regions lags behind when compared with urban centres.

Moldtelecom dominates the broadband sector, holding almost 97% of all subscribers. Its main rivals in the sector are Arax-Impex, Riscom, Sicres, Orange Moldova and the state-owned railway company Calea Ferata din Moldova.<sup>10</sup>

Belarus has a relatively developed Internet infrastructure as the incumbent has infrastructure in throughout the country. The one looming threat here is the Government's desire to control and monitor Internet traffic, the size limit of the International Gateway and the exclusion of the mobile carriers and others from carrying and terminating their own international voice traffic. The Government recognizes these problems and is working on ways of expanding the size of the International Gateway, but liberalization of the gateway is still not on the list.

The Government after promising for many years to privatize Beltelecom and to liberalize the market has failed to do so and this has hampered the growth of the fixed broadband market and also the growth of the mobile broadband market. There is no independent regulator in the country and much regulatory uncertainty, which has been hampering investment in the region. However, in the past year the Government has made some good decisions, which give much hope that future growth is not far behind. Some of these are the decision to allow licensed ISPs to offer Internet access over Wi-Fi, the granting of WiMax and LTE licenses. It is hoped that with the expansion of the mobile networks of the operators and the deployment by some

---

<sup>10</sup> Bmi Telecom Moldova Report, March 2011

carriers of LTE throughout their mobile network infrastructure, Beltelecom will increase its own investment and network roll-out plans and force internet interconnection prices down.

Ukraine continues to have one of the lowest penetration rates for broadband in the Central and Eastern Europe region. According to Business Monitor International, the Ukrainian business and regulatory environment are not as favourable as they were in Belarus. Their data shows the Ukraine continuing to score poorly in terms of Industry Rewards, and is one of the lowest in the region. Ukrtelecom continues to dominate the broadband market with an estimated market share of 35%. Vimpelcom is one of Ukrtelecom's largest competitors in the broadband Internet market since it acquired Kyivstar in 2010. In August 2011, it announced it was building a fiber-to-the-building (FTTB) network in two new cities, bringing its FTTB network to 76 towns and cities, and providing a boost to high-speed broadband access in the country. Vimpelcom has also greatly expanded the geographic scope of its network and in addition is using FTTB to give it a competitive advantage over the incumbent's existing infrastructure. These much higher connection speeds, up to 80Mbps, will make this network extremely attractive and affordable to its customers and should result in rapid uptake and provide increased competition for the incumbent.

The ongoing delays in licensing 3G services continues to hold back development of mobile data and Value added Services in the Ukraine, leaving it trailing other countries in the region. However, with the deployment of 3G networks by carriers Ukraine's value-added service market is expected to grow significantly over the next few years. Ukraine has only given out 3G licenses to the incumbent operator and not to other mobile carriers thus only the incumbent is able to deploy a 3G network and take advantage of the speed, content, and other value added services that are offered once all operators have received their 3G licenses and begin deploying. Work is also moving ahead in the licensing of LTE technical. However, there are looming problems on the horizon as the LTE licensing process appears to be suffering from the same problems that have hampered the 3G licensing process. Hopefully these will be resolved and carriers could be deploying the needed infrastructure that will allow a significant amount of people to have Internet access.

Ukraine's broadband market has suffered from under investment from Ukrtelecom and consequently there are opportunities to target neglected areas even in the major urban centers. This, coupled with the limited W-CDMA deployments in Ukraine, means WiMAX should emerge as a major broadband technology in the country. Recently the incumbent telco, Ukrtelecom, announced plans to invest heavily in deploying broadband infrastructure across Ukraine. It plans to finance this deployment by selling its mobile division. Other carriers are also planning to heavily invest in deploying new broadband infrastructure and to covering more rural town and smaller cities.

Carriers have gotten around the licensing problems by deploying wireless data networks using EVDO and HSPA technology and then selling VAS on top of these networks. This is despite having not yet received 3G W-CDMA licenses. Among the operators offering mobile Internet services using a CDMA platform are Telesystems (PEOPLEnet), ITC (CDMA Ukraine) and Intertelekom. In addition to CDMA, there are also a growing number of WiMAX operators in the Ukraine.



Other ICT developments are the Government's agreement with Vietnam's Viettel to roll-out broadband access for Ukraine's education system. The memorandum is part of the Open World Ukraine project, which is aiming to improve IT provision in rural schools by building an interconnected network and equipping pupils with netbooks. According to the agency, a 4G network will be established within five years on which a national database for textbooks can be stored, centralised assessment of knowledge can take place and statistics and analytics on the education system can be run.

In Belarus, the strongest potential for growth for is in the rural areas of the country and in the smaller towns and cities. It is these places where competition has not come and that are ripe for growth. These cities had been waiting for a rollout of fixed broadband infrastructure that has been underserved for many years. It is hoped that this will change as a result of some recent rulings by the Government has been a positive step towards the liberalisation of the sector.

### 2.3 Investment Climate in the Region

Belarus has a geo-economic (geographic location and comparative stronger economic performance) advantage that makes it ideal potential hub of ICT and broadband development in the region. It is one of the top rates in investment climate in the Western CIS and is near the top in ease of doing business 68 as compared to 90 for Moldova and 152 for the Ukraine. Most importantly it has worked hard to reduce the red tape needed to start a business, where it is ranked 9 out of 183 countries (vs 88 for Moldova and 112 for Ukraine) and has a very high rating on enforcement of contracts, 14 out of 183 (vs 26 for Moldova and for Ukraine). It also scores higher than its neighbours in the region at protecting investors (79). Moldova and the Ukraine are tied at 111. Belarus strengthened investor protections by introducing requirements for greater corporate disclosure to the board of directors and to the public. It also worked to enhance access to credit for small businesses by facilitating the use of the pledge as a security arrangement and providing for out-of-court enforcement of the pledge on default. Furthermore, business start-up was speeded up by simplifying registration formalities, abolishing the minimum capital requirement, limiting the role of notaries, and removing the need for a company seal approval. All of these items moved Belarus to the top country in the region for starting a business.

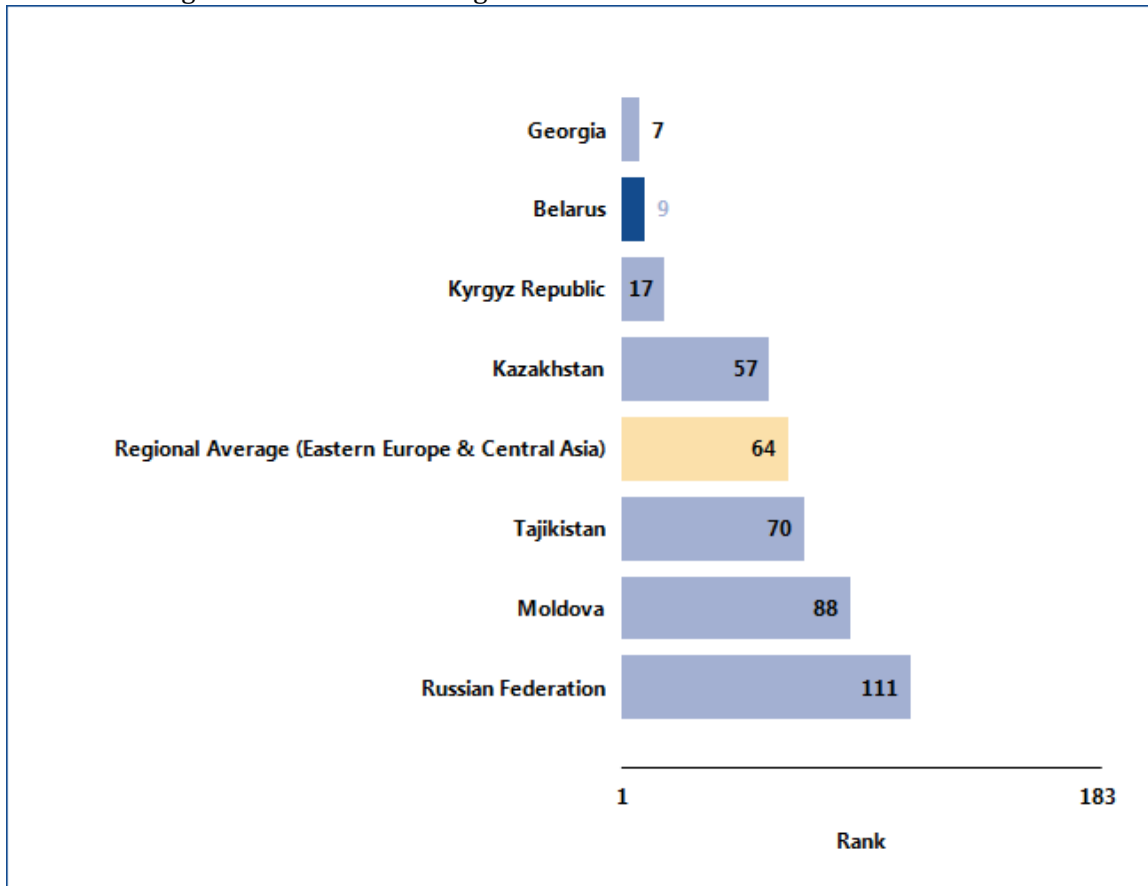
Well-functioning courts help businesses expand their network and markets. Without effective contract enforcement, people might well do business only with family, friends and others with whom they have established relationships. Where contract enforcement is efficient, firms are more likely to engage with new borrowers or customers, and they have greater access to credit.

Investor protections matter because they provide the much-needed financial capital for SMEs to grow, innovate, diversify and compete. If the laws do not provide such protections, investors may be reluctant to invest unless they become the controlling shareholders. Strong regulations clearly define related-party transactions, promote clear and efficient disclosure requirements, require shareholder participation in major decisions of the company and set clear standards of accountability for company insiders. a higher ranking does indicate that an

economy's regulations offer stronger investor protections against self-dealing. Belarus also scored high on resolving commercial disputes through the Courts system in Belarus. All of these issues help make Belarus a very favourable climate for SMEs.

The following chart ranks the countries in the region and shows which ones have the best climate for SME growth. As you can see the two focus countries of Georgia and Belarus have the best climate and make it very easy for new entrepreneurs to start new businesses.

Ease of Starting New Businesses in Region



Source: Belarus Doing Business 2012, [www.doingbusiness.org](http://www.doingbusiness.org)

In addition to having a very favourable investment climate, Belarus also has the highest penetration rates of the region. However, there are still many obstacles to overcome in attempting to make Belarus an ICT capital, most glaringly is the lack of an integrated ICT policy and strategy. While, Belarus has some e-Commerce legislation, what it lacks is an overall integration of their ICT policy with their education, health, electricity, road, and other utilities.

Attempts have been made to create such a strategy and to work on integrating ICT into all institutions, with particular emphasis in Education, health, and technology. Work is also being done in agriculture, manufacturing and other sectors. In 2003, the European Commission launched the *European Neighborhoods Policy* (ENP), which introduced the concept of *Neighborhood Programmes*, laying the ground for closer cooperation with the neighboring

countries of the enlarged Union. Through these programs the EU has funded many IT products in the region from data centers to tech parks to tech transfer and other technology-focused areas.

According to GIPI data, there is a very low level of awareness on Information Society and Internet Governance issues among possible stakeholders and those affected by ICT and Internet policies. These trends result in the situation when Belarusian decision makers have a very narrow vision of information society issues, lacking input from various fractions of Belarusian society being unable to develop adequate and effective plan of action.

In the past few years, Belarusian higher education institutions have become involved in more than 50% of the international research activities. During the past 5 years, the number of such cooperation agreements has virtually doubled, however there is still a long road ahead as only 5% of Belarusian universities are involved in ICT research with EU partners.

#### 2.4 ICT policy, regulatory framework and institutional diagnostic

At the beginning of the 2000s all three countries undertook a path of sector reform, but since, the speed of institutional modernisation has slowed down considerably.

The absence of a coherent and enforceable legal framework has been the primary contributor to the relatively slow pace of reform in Ukraine. However, in 2007 the Ukrainian Government finally approved Ukrtelecom's inclusion on the list of enterprises to be sold off. The regulatory framework governing the telecommunications industry in Ukraine significantly improved after the Law On Telecommunications came into force in December 2003. The law sets forth the general principles for telecoms activities, networks and services, including the relationships between operators and customers. The new law established two executive bodies to regulate the sector: the National Commission for Communications Regulation (NCCR or NKRZ) and the Central Executive Authority in the Communication Sector (CEACS).

The National Commission for Communications Regulation of Ukraine (NCCR or NKRZ) is the organisation with chief responsibility for regulating Ukraine's telecoms sector. It was established by the Telecommunications Law of 2003 and became operational in 2005. The Telecommunications Law provides equal rights for individuals and legal entities including: foreign entities, telecommunications services, fair competition and freedom of pricing, among other things. The Telecom Law also sets forth the legal, economic and organisational framework for the operation of companies, associations and government bodies forming a part of the telecommunications network. The licensing of telecom services, the requirements for equipment certification and liability for violations of Ukrainian legislation on telecoms are also determined by this legislation. The Telecom Law also governs the relations between the state and local governmental bodies, telecom operators, users of telecoms services and radio Frequencies. The law also addresses new areas of telecom services, including numbering requirements, tariff and settlement regulations, interconnection, public telecommunication services, market access rules and licensing issuance and renewal. It also significantly expands the definition of the telecommunications services market, including in its scope IP telecommunications, transmission of data and facsimile communications.

The debate as to when 3G mobile licenses will be awarded has been going on since 2005 when the incumbent was granted a 3G license. The other carriers have tried to get licenses but have been denied as the Regulator has delayed time and time again to auction these off. In the meantime, MTS has launched 3G-style services over a CDMA450-based network, as has fixed wireless operator Telesystems (PEOPLEnet). Ukrtelecom launched its Utel-branded 3G service in November 2007, and, in 2008, Kyivstar, now owned by Vimpelcom launched 3G-type services over its GPRS and EDGE networks. However, the operator is forced to rely on an expensive interconnection agreement with Ukrtelecom/Utel for full 3G services. MTS, VimpelCom and PEOPLEnet also have interconnection agreements with Utel. Astelit, another operator, is seeking to use some of its vacant 800MHz spectrum to offer 3G-like services, but it, like the others, is wary of investing heavily in these make-do solutions and continues to hope for signs of progress in the 3G licensing debacle.

In Belarus, with the exception of the mobile sector, the telecommunications market remains relatively closed to competition and is almost entirely under the control of the state. The government controls the market via the Ministry of Communications and Informatization, which effectively acts as the national regulator and oversees the development and implementation of national telecommunications policy. There is no indication that an independent national regulatory authority will be established in Belarus in the near future.

The fixed-line sector is a state monopoly for incumbent Beltelecom, which also dominates the Internet sector. The government previously indicated it would ultimately privatize state incumbent operator Beltelecom, as part of its commitments to the WTO. However, no timetable for the operator's privatization was set and in October 2010, Belarus' president Alexander Lukashenko, stated his opposition to the sale of Beltelecom. The Government has also failed to outline any plans to open the country's fixed and Internet sectors to competition. Despite the Internet sector not being liberalized, there are a small number of alternative ISPs existing within the Internet sector.

The mobile sector, in contrast to the wireline sector has a greater degree of competition and private sector investment. With Turkcell now controlling BeST and with Telekom Austria controlling Velcom, MTS Belarus remains the only mobile operator that the government has significant control over. MTS is known to be interested in taking a controlling stake in MTS Belarus, although the government has so far rejected MTS' requests.

The Ministry of Communications and Informatization (MCI) is the sole regulatory agency in Belarus. It determines telecommunications sector policy, develops and promulgates all legislation relating to the provision of telecommunications services in Belarus, and issues licenses to approved operators. Giprosvyaz is the state scientific research institution that oversees the technical development of telecommunications in Belarus.

In 2010, the Ministry listed as its priorities for the sector the following six goals:

- Managerial and legal reform of the telecom market aimed at competition development and preparation for joining the World Trade Organization;
- Expansion of the stationary and mobile telecom networks, prevention from unauthorised access, reliable operation in emergency situations and military state;

- Expansion of the data transmission services in the stationary and mobile telecom networks and arrangement of the conditions for transfer to the packet switching telecommunication networks for rendering the telecommunication services with broadband access technologies and ensuring the necessary quality of service;
- Technical modernization of the public telecommunication networks by means of replacement of the analogue switching equipment for the digital one with maximal use of the equipment produced by domestic enterprises;
- Application of the new information technologies and telecommunication technologies, including by means of the joint research and development works by the domestic scientific and industrial organisations;
- Improvement of the regulatory legal basis and technical normative legal acts as regards the arrangement and ensuring the communication and television and radio broadcasting, operation stability and security of the public telecommunication network, communication means, networks and units.

In October 2008, Belarus amended the existing telecoms laws to make them in line with the EU telecom directives. This new telecom law also relaxed the limits on the number of companies licensed to deliver communications services. Despite the government inability to liberalise Belarus' fixed-line sector, the ICT Ministry decreed that Belcom would lose its monopoly position on interconnection. Belarus is very interested in joining the WTO and one of the main requirements to accession is for Belarus to open up the markets for basic telecommunications services to competition.

## **2.5 Country focus: Moldova**

### *2.51 Economy*

In the first years after independence, the political situation in Moldova was characterised by volatile coalition majorities and short-lived governments. This changed after the parliamentary elections of March 2001 in which the Communist Party won a landslide victory and a constitutional majority of parliamentary seats. Since its declaration of independence in 1991, Moldova has gone through a series of difficult transitions at enormous social cost. The first decade of the transitional period was also marked by political instability and a deep economic recession. Renewed economic growth in 2010 and potential opportunities emanating from the eventual prospect of European Union integration have created an environment conducive to modernization and positive change in Moldova.

Moldova has adopted the Millennium Development Goals and has remained committed to achieving these goals through various means, including intensifying collaboration with all relevant partners. However, Moldova remains one of the least developed countries in the regions of Europe and the Commonwealth of Independent States with a gross domestic product per capita of USD 2,986.8 The Republic of Moldova's 2010 human development index stood at 0.623, positioning the country at 99 out of 169.

Moldova's transition to a market economy system was marked by a particularly prolonged and deep recession. Russia and the Ukraine, economies with which Moldova has strong trade ties,

experienced similar problems. Although growth finally restarted in 2000, the strength of the recovery from 2000 onwards was weaker than in other neighbouring countries. This was largely due to Moldova's high vulnerability to external shocks (given its trade structure) and adverse weather conditions. As a result, real GDP in 2005 was still less than half of the 1989 level.

Both the Constitution and the Law on the Court System stipulate that the judicial system must be independent of the executive and the legislative powers. The Moldovan government understands that the reform of the judiciary is a priority; most importantly increasing the independence of judges and prosecutors, ensuring access to justice and enforcing court decisions. Public sector reform is another area that the Government is working on with donor support. Institutional capacity in the public sector remains weak and government institutions often do not perform efficiently due to inconsistencies in their functional and institutional frameworks.

Since 2007, Moldova has had at least one election every year. At the same time, the parliamentary elections since 2009 have failed to secure the nation's president, creating significant political uncertainty. Following a parliamentary election in November 2010, a reconstituted Alliance for European Integration (AEI) coalition consisting of the three non-communist parliamentary parties was formed. However the AEI coalition still lacks the three-fifths majority in parliament needed to vote in a new head of state. According to the constitution, another parliamentary election must be held if the current parliament fails to elect a president. The local and municipal elections in June 2011 were inconclusive and bitter in fighting between the coalition parties is likely to lead to the early dissolution of the ruling alliance. Persistent unemployment, the prospect of public-sector job cuts and a scaling back of public services, at a time of high inflation and deterioration in the external economic climate, could be used by the opposition to foment public discontent. After failing to elect a President, it is likely that new Parliamentary elections will be held this spring.

Moldova hopes to negotiate an Association Agreement with the EU, offering expanded trade preferences, political stability and a visa-free regime, but the current crisis in the euro area has been distracting attention from this issue. A summit of the EU's Eastern Partnership countries held in the Polish capital, Warsaw, at the end of September 2011 encouraged its former Soviet members, including Moldova, to make practical progress towards EU membership.

The EIU estimates real GDP growth at 5.5% in 2011, down from 6.9% in 2010. In the first half of 2011 they estimate that real GDP grew by 7.5% year on year. Mostly on the strength of export-led recovery in manufacturing, as well as by rapid growth in wholesale and retail trade, supported by robust domestic demand. According to the EIU, year-on-year inflation came down in September 2011 to 8.8%, from a peak so far in 2011 of 9.2% in August 2011.

## 2.52 ICT and broadband sector

Reform in the public utility sectors is an important element of development policy, particularly as a means to attract needed investment in poor infrastructure systems and consequently increase service provision. Some sectors are more likely to attract private investment, but all public utility sectors can benefit from effective regulatory oversight, particularly if regulation is clearly informed by development goals and focused on promoting sector development. In Moldova, the lack of a Governmental wide ICT strategy as well as developmental goals hinders any infrastructure initiatives by the Government. It also is hindering the growth of Small and Medium Enterprises (SME), making Moldova less attractive to private investment.

Moldova's current National Development Strategy (2008-2011) has five major goals:

- Strengthening democracy, rule of law and human rights;
- Resolving the Transnistria conflict and reintegrating the region;
- Improving competitiveness of the national economy;
- Developing human capital, employment and inclusion; and
- Regional development.

The country has not adopted an ICT strategy for the coming years. Moreover, despite advances, opportunities for the people of Moldova have not yet been fully realized due to the slow pace of market reforms, weak institutional capacity, and lack of resources to boost service delivery at the local level. A new long-term National Development Strategy until 2020 is currently being formulated. However, this new strategy does not even mention ICT. Let alone how best to integrate ICT in all areas of the Government. The main goals are: Legal Reform, Business Reform, Education Reform, Road infrastructure, Social Security/Pension, Energy. The strategy lacks any form of Action Plan on how the Government will achieve the objectives set forth in this plan nor how to measure how well the Government is doing in meeting these objectives.

The current strategy shows the Government's lack of understanding of the impact that ICT can have in helping the Government to transform its economy. While there are several people in the Government who understand the transformational power of ICT, there are many others who do not. As such there is a great need to educate these leaders so that ICT can be the engine that drives growth in the country.

For example, in the section on Road Infrastructure, there is no integration of the linkage between building roads and laying fiber. The roads are being rebuilt around the country and this is the perfect opportunity to lay fiber, however, this opportunity is lost because the Roads Authority does not understand the importance of integrating ICT into all levels of development. They see it as merely the ICT Ministry encroaching on their territory. There are also no building codes and as a result companies are laying fiber in a haphazard manner, from trees, buildings, anything that is tall has fiber strung from it. If there were some coordination between the Roads Authority, the building authority and the ICT Ministry laying of fiber would be done in a smart and efficient manner and one that ensures that there is a coherent manner and structure to building. The same is true for the Social Security Administration and all other agencies. Until there is an understanding by all agencies in the Government of the

impact and crucial importance to the country to integrate ICT into all agencies and into all fields, it will be difficult for the country to reach its goals.

There is a significant gap in leadership and vision within the Government. Leadership and institutions are key. Leaders need to have a deep understanding of policy, political organizations and the social impact of ICT and of network-based competitiveness. Unfortunately, there is no one in Moldova who has taken up this mantra. This leader should use a collaborative leadership style and be willing to work with all stakeholders. It is only by having as many top leaders involved that you can get a cross-sector transformation.

There is a great need to work together with other Government agencies to create a new vision for the country that will change the behaviour of Government Agencies, businesses, education institutions, and citizens and how the country will use ICT to help it leapfrog over other countries. There is a great need to set obtainable goals that everyone in the Government can agree on and to move forward in achieving these ICT goals. Currently there is no common understanding among Government Agencies on what these goals should be. The current Committee that is working on this new development strategy consists of 16 people and each one has a different viewpoint. There is an inability of this committee to agree on what goals, and objectives should be included in this vision and then how these should be achieved. As a result, the country is left without both a clear Development Strategy and an ICT strategy.

This lack of ability to agree on an ICT strategy is also what is holding back the adoption of a broadband strategy. While there has been drafts of this policy floating around it has failed to be adopted since there is no agreement on what broadband should encompass. Without an agreement on how to define broadband, or even on the importance of broadband to the overall economy and the growth of the country, there can be no strategy. The lack of a broadband strategy is also hampering the development of a Universal Access Fund as called for in the Telecom Law. The regulator has stated that until they have a definition of Broadband they see no need to create a special Universal Access Fund as Mobile phone coverage can be reached throughout the country. The law calls for a 1% of revenue for all telecom operators to go to this fund. Currently operators are paying 2.5% of their revenues to the Government to support its social service and poverty fund and once a Universal Service fund is created the Government will most likely lose this additional 1.5%.

### 2.53 Telecom and Mobile Infrastructure

The Moldovan electronic communications market was liberalized in 2004. The liberalization process appears to have been a big bang approach, with unclear rules of engagement for new players interacting with the incumbent Moldtelecom. During this period Moldtelecom responded as all incumbents by making interconnection and interoperability a difficult process for the many new entrants. In the Moldovan Electronic Communications market there are 257 licensed networks and 320 licensed services.

During the past five years mobile operators because they had been unable to gain access to the infrastructure and local loop of the Incumbent MoldTelecom built their own fiber networks to cover the city and country. They now do not rely much on the copper network of



MoldTelecom. Internet providers have also built their own fiber networks and so there are a number of highly advanced fiber networks all around Chisinau and throughout the country.

There are three mobile operators, Orange, Moldcell, and Unite. At the end of 2010 there were 2.76 million mobile customers, equivalent to a penetration rate of 88.8%. However, despite solid growth in the number of subscribers, Moldova's mobile penetration rate remains the lowest in the region. Although mobile networks provide near national coverage, the take-up of mobile services in more remote regions lags behind when compared with urban centres.

Other statistics are as follows: Fixed telephony 32.6%, Fixed Internet access 7.6%, and Cable television services .5%. In 2010 the total amount of voice traffic to mobile networks for the first time exceeded the traffic in fixed networks. Compared with 2009 it increased by 18.5% and exceeded the number in 4.10 billion minutes.

Moldtelecom dominates the sector, holding almost 97% of all subscribers. Its main rivals in the sector are Arax-Impex, Riscom, Sicres, Orange Moldova and the state-owned railway company Calea Ferata din Moldova.<sup>11</sup>

The future development of the electronic communications market is clearly dependent on various economic stimuli and clear vision for the country driven by the Government. The Government adopted a Development Program for 2010-2013, which addresses the access to the Internet using broadband technology. In this Development Program the sector of electronic communications the specific task is to achieve by the end of 2013 the level of penetration of fixed broadband services to 20% as well as the same level of penetration of 20% for mobile broadband services. Moldtelecom has embraced this initiative but would like to see this as a national priority development program.

A phenomenon that is quietly and rapidly developing is the rapid rollout of fibre capacity throughout the country. This has been confirmed through interviews with all three operators and with the ISP Starnet. Starnet have used existing power distribution poles and trees across Chisinau to support its cables, which is possibly the lowest cost highest value entry into the market in contrast to Moldtelecom that have invested in traditional underground ducts for distribution. Fiber is the key to the competitive edge in the future. The collective use of shared fibre capacity as a national commercial enterprise is a foundation for national economic initiative to deliver high value services for ICT sector growth.

The Mobile Operators are building out their 3G and 4G networks and intend to push and promote a mobile Broadband service. The ongoing deployment of 3.5G HSDPA technology will expand mobile data and internet-based services. Moldtelecom's technology strategy has adopted an ambitious and sound technology architecture that will deliver extra-wide bandwidth connectivity, known as NGA (Next Generation Access). This Broadband service will avail the average customer will services at speeds of more than 25-30Mbps and even speeds up to 50Mbps. The core technology is a modern NGN (Next Generation Network)

---

<sup>11</sup> Bmi Telecom Moldova Report, March 2011

environment built on their nation fibre network with the capacity to deliver software defined high value services efficiently.

Moldova had almost 387,000 broadband connections, equivalent to a penetration rate of 10.9%. During 2010, the market grew by 45.5%. In addition to the 50% increase in mobile broadband subscriptions, the number of xDSL connections grew by more than 24% while subscriptions based on FTTx and local area network (LAN) technology increased by almost 116%. Although Moldova has over 40 internet service providers (ISPs), the two service providers Moldtelecom and StarNet account for almost 88% of the fixed broadband market. Other players are Orange and Sun Communications. The fixed broadband sector has benefited from the growth of xDSL and optical-fibre (FTTx) connections. Moldtelecom appears to be primarily responsible for the growth of the xDSL segment. The advancement of IPTV services by Moldtelecom and StarNet will further increase subscriptions based on optical fiber. Moldtelecom launched IPTV in February 2010 while StarNet also has launched its own IPTV package.

Orange continues to be the market leader with 62.4% with Moldcell having 32% and MoldTelecom UNITE at 4.7%. 3G services have been deployed through out the country and about 59% are customers of Orange Moldova, 33.5% - Moldcell and 7.5% of Moldtelecom's UNITE.

The Mobile carriers are hesitant to roll out mobile content and other data heavy services because of the very high piracy levels, which stand at 92% for Moldova. The massive stealing of intellectual property whether it is movies, or other video in the country and region is hindering the growth of the mobile data market and the introduction of value added services. From Interviews with Operators and with the ICT Association in Moldova the problem with Piracy is not the laws but the lack of enforcement of these laws. The top goal of the Moldovan ICT Industry this year is to update the current Intellectual Property laws and to greatly improve the enforcement of these laws.

#### 2.54 ICT policy, regulatory framework and institutional diagnostic

Telecommunications services are regulated by the National Regulatory Agency for Electronic Communications and Information Technology (ANRCETI), which was established in March 2008 after the former National Regulatory Agency for Telecommunications and Informatics (ANRTI) was reorganised as the new Law on Electronic Communications came into play. The ANRCETI is independent from the government, although the government approves the ANRCETI's director and deputy directors and the Agency must base its regulatory activity on government-approved regulations.

The Ministry of Information Development is responsible for implementing government policy in the field of telecommunications and telecommunications development strategy. It is entitled to supervise the compliance with the legal requirements and coordinate, from a technical perspective, the activities of telecommunications carriers. The ministry represents the government of Moldova at the various international organisations involved in the telecommunications industry and co-ordinates with its counterparts in other countries.

Public policies have a great impact and affect on sector performance, which is why it is important to create policies that allow for an open and transparent market so competition can develop and flourish. However, even though policies are linked to sector performance, evidence has shown that weak institutions have a greater negative impact on the sector than does policy reform, as such, a greater emphasis needs to be placed on capacity building activities within the independent regulator, and the government.<sup>12</sup> Penalties for violating regulatory rules are often not as effective if they cannot be enforced because of capacity issues. Often the imposition of penalties on carriers further weakens these institutions, especially if the institution is not able to enforce them as it lays open to all their weaknesses and ineffectiveness. Limited regulatory experience coupled with the demands of a new organization as well as limited capacity and resources are only some of the factors constraining regulatory activity.

While Moldova is trying to move forward and change its laws as it attempts to enter the European Union, it is hampered by a stalemate in the political process. Until this is resolved it is extremely difficult to get new revisions to current laws and also to adopt more International best practices. The current inability of the current Government to elect a President will likely lead to new Parliamentary elections in the spring. As such, there is not much political will going forward to make changes. Only issues that have been agreed upon by both the parties in power can be implemented. The clearest example of the failure to make change is the failed attempt to implement tariff rebalancing that all have agreed is needed. Additionally, the new revised amendments and laws for the Telecom Sector based on the European Union's 2009 laws as well as other changes suggested by the EBRD consultants that make them more in line with International best practices need to go for Parliamentary approval to become law in Moldova.

Although ANRCETI celebrated its 10-year anniversary recently; most of those years were under the old law, which was not in-line with EU rules or best practices. The most recent ICT law that closely parallels the requirements in the 2002 EU Directives only became effective in 2008, three short years ago. Moreover, ANRCETI has been hampered by its inability, for political reasons, to keep a chairman for more than one-two years. Furthermore, its inability to create a strategic plan or even to set a regulatory agenda for the year constrains its ability to regulate. Since capacity was so weak, the agency sought and obtained EBRD support for technical assistance. It has only been in the past year that the Agency has been able to identify the key markets and perform the most needed market analysis. Moreover, only in the past month has the Agency begun using a cost model that the EBRD consultants helped create. ANRCETI is still struggling to develop coherent regulatory frameworks to guide its activity in the sectors they regulate and is greatly hampered by the split in responsibilities over spectrum between the Ministry and the Regulator. As such, limited regulatory experience coupled with the demands of a new organization as well as limited capacity and resources are only some of the factors constraining regulatory activity within ANRCETI.

---

<sup>12</sup> Evaluation of the effectiveness of multi-sector regulators in West Africa, World Bank funded project.

ANRCETI has been unable to set a regulatory agenda and highlight what it feels are key priorities for the year. Indeed, rather than establish a clear plan of action framed around specific sector objectives and priorities, regulators allow the public and Operators to become discontent, increasingly sceptical of the regulatory process, and diminish their credibility as regulatory agencies. The ability of regulators to establish regulatory priorities and consequently prepare and issue regulatory decisions is critical in the development of the sector. The lack of any vision and the failure to set the regulatory agenda and decide on the priorities for the sector highlight several process failures within ANRCETI that should be corrected. It is unclear how the Regulator is choosing which actions to take and why these actions or decisions were chosen above other regulatory priorities. Without a key plan and identification of priorities for the sector the regulator makes poor choices of what regulation to focus on.

Regulatory authority and institutional strength are dependent on political stability and the ability of the regulator to develop a credible position in the country and within the government. This position is hampered because of the confusion of responsibilities concerning spectrum between the following agencies, the Ministry of Information Technology and Communication, ANRCETI, State Commission, NFRC and the ACC. The current system is not only inefficient but it is also impeding effective management of the spectrum resources.

Secondly this division of responsibilities means that there is no single agency with clear spectrum policy and principles to guide planning and resolution of important and pressing spectrum issues associated with Wireless Broadband Strategies, Universal Service, Spectrum Licensing and Pricing, Refarming Processes, Digital Switch Over, and the Digital Dividend. As a result, efficient spectrum management has been discouraged and investment in new electronic services and network technologies has been delayed. Additionally, the current framework allocation of spectrum responsibilities impedes the release of underused spectrum currently allocated to Government departments.

Another issue relates to ANRCETI's inability to monetarily penalize operators who violate its regulations. ANRCETI needs to be given a stronger enforcement role and some additional teeth to help it enforce the new regulations and actions it has taken. Currently, it can only impose puny fines, which are merely symbolic and have little if no effect. It needs to be given the ability to impose tougher sanctions and fines on the companies it regulates.

The proposed new ICT laws for Moldova which incorporate the 2009 EU Directives will allow the country to continue along the path of liberalization moving towards a more open, transparent, and competitive market for all carriers.

It is clear that the political will is there to implement these reforms as the proposed ICT law for Moldova localizes and implements the EU Directives from 2009 as well as other important regulatory issues relating to independence and other important elements of competition policy such as pricing for capacity and other telecom and non-telecom services, non-discriminations, essential facilities, abuse of dominance, infrastructure sharing and other competitive safeguards that need to be met and addressed. These laws, when implemented, will work to

prevent the incumbent from using a myriad of anti competitive tools to force competitors out of the market.

The current ICT law enacted many measures designed to prevent major suppliers or other SMPs from engaging in anti competitive practices ranging from excess prices, price discrimination and predatory low pricing to refusal to deal and vertical restraints. The new law moves these issues further and provides the regulator with more tools for identifying and enforcing prohibited acts such as cross-subsidization, predatory pricing, using information obtained from competitors with anti-competitive results and not making available to other service suppliers on a timely basis technical information about essential facilities and commercially relevant information which are necessary for them to provide services.

ANRCETI has been receiving technical assistance from the EBRD for two years and in these years much work has been done to bring the Moldovan regulatory environment and ANRCETI closer to international best practices. In the past 1.5 years ANRCETI has identified 10 markets where it felt that abuses could affect competition. It has completed the market analysis of these 10 markets and has identified the carriers that have Significant Market Power in these markets and now is beginning the process of developing and implementing the remedies to resolve these issues and ensure that competition is allowed to flourish.

### 3. Key issues to be addressed in curriculum development and training

#### 3.1 **Focus on training for public officials**

There is a clear need for development in problem solving, decision making and leadership skills in key areas of policy and strategy development, consultation processes, and other democratic governance tools that make an important part of the development of policy. This kind of training is providing more qualitative than quantitative skills that require more of a strategic thinker than a technician.

Training of this sort should also be done in parallel with the development of understanding business needs and operational issues of how companies work in an electronic environment. For example: ecommerce, issues of cyber crime regulation. Additionally, there needs to be training on regulations and how to craft regulations that would help new businesses surmount the various regulatory obstacles. In Belarus, the Government has been working hard to ease some of these obstacles and difficulties that SMEs have in opening and operating businesses and in complying with relevant regulations and with paying taxes. However, in Moldova there remains much work to be done and possibly the training could be used to help provide various officials with the understanding of the importance of ICT and Broadband to the growth of the economy and how certain changes in regulations can lead to this growth. As the annual doing business reports for the region show, there is still much work and training to be done.

An inclusive and participatory approach will be used to develop the curriculum and implement the program. This is to ensure a high-quality program that meets the growing and diverse demands of policymakers. The main areas for training for public officials, based on the previous diagnostic and analysis, are the following:

### **Module 1 – The Linkage between ICT Applications and Meaningful Development**

Highlights key issues and decision points, from policy to implementation, in the use of ICTs for achieving the Millennium Development Goals.

### **Module 2 – ICT for Development Policy, Process and Governance**

Focuses on ICTD policymaking and governance, and provides critical information about aspects of national policies, strategies and frameworks that promote ICTD. The module could also cover the following topics: Democratic governance tools, consultation process, institution making, institutional processes, regulatory processes

### **Module 3 – e-Government Applications**

Examines e-government concepts, principles and types of applications. It also discusses how an e-government system is built and identifies design considerations. This module would include sessions on eGovernment tools and mechanisms that will bring enhancements to citizen services, both in the business to business, business to government, government to citizen, and business to citizen. This training would also focus on the use of cloud computing to eliminate corruption and bring a higher level of service to citizens. This is especially pertinent to this region as Moldova is leading the way in a ground-breaking cloud computing center in the region.

### **Module 4 – ICT Trends for Government Leaders**

Provides insights into current trends in ICT and its future directions. It also looks at key technical and policy considerations when making decisions for ICTD.

### **Module 5 – Internet Governance**

Discusses the ongoing development of international policies and procedures that govern the use and operation of the Internet, such as, New Challenges to critical Internet resources: blocking and filtering at the DNS; IPv6; and Security, Stability, and Resiliency; policy principles governing the Internet; Changing Landscape of the domain name System: new gTLDs and their implications for users; Opportunities and Risks: ICTs for Disaster Response: How the Internet is transforming Emergency Management

### **Module 6 – Network and Information Security and Privacy**

Presents information security issues and trends, and the process of formulating an information security strategy. Also discussions on cybercrime, fraud, cyber security. How to form partnerships with other Governments to combat cybercrime. The importance of the Budapest convention and how it can help Governments combat cybercrime; Discussion of the available resources both public, private, governmental that can be deployed.

### **Module 7 – Options for Funding ICT for Development**

Explores funding options for ICTD and e-government projects. Public-private partnerships are highlighted as a particularly useful funding option in developing countries.

### **Module 8- Leadership skills**

This module will focus on building Leadership training, problem solving, decision making

processes skills

### **Module 9- Ecommerce Skills**

This module will focus on Business e-tools including ecommerce. Understanding of how businesses operate in a broadband rich environment (including exchanges and visits to businesses that have an Internet rich content, or having some of these entrepreneurs come to talk)

### **Module 10- ICT economics and Open Access and Infrastructure sharing**

This module will cover the economics of cost related regulation such as interconnection, settlement charges, price cap mechanisms, cost models, and significant market power determination and also focus on open access and infrastructure sharing.

### **Module 11- Spectrum advances and new technologies**

This module will cover new technologies, spectrum advances, new ways of using spectrum, what is the Spectrum Dividend and how to make the most use of it.

### **Module 12: Regulation and Competition issues**

This module will cover legal development in the application of regulations and issues of competition, discuss the impact of convergence on the regulatory frameworks, including broadcast, new media, traditional telecom regulations

## **3.2 Focus on academic programmes for students**

In principle, many of the courses for officials can also be useful to students; however, with the focus on entrepreneurial development, there are some unique tools that can add significant value to this sector, such as the following:

- Computer tools for businesses. Even before going to the Internet, there are a number of tools that potential entrepreneurs need to learn. Although there is no specific access gap analysis on this, just teaching entrepreneurs how to use a computer can be of immense value.
- Internet tools people and for businesses. (Development of a local broadband KIT for SMEs) B2B tools and resources, marketing through the Internet, selling through the Internet. Case studies of people who have successfully made fortunes through the use of the Internet.
- Web development and design, one of the most basic and powerful tools for entrepreneurs today.
- Development of e-tools and e-applications, from a conceptual business perspective to the technical aspect
- Intellectual property and cybercrime skills for businesses.
- How to compete in the global economy
- Institutional development
- New technologies and applications
- Knowledge management for SMEs

## 4. Conclusion

The three countries of the Western CIS region that are part of this study: Belarus, Moldova, and the Ukraine, share a number of advantages and many challenges. Their geographic position means they are close Europe markets but distant from its institutions. Their greatest disadvantage is that they are late at the ICT competitiveness game with rapidly advancing countries in Eastern Europe and the Baltic countries, that its institutions are still developing very slowly and that SME still do not have the type of broadband connectivity that could make their potential for export more appealing. If they can avoid social unrest and regional wars, they could in the course of this decade, turn the tide on their favour.

ICTs can and should play a significant role in driving strong regional development and integration in today's digital economy. There is little doubt among developing countries that increased access to ICT infrastructure is a critical engine for trade, growth and competitiveness, as well as a major contributor to poverty reduction. Growth is the single most important driver behind poverty reduction and is a key component of any poverty reduction strategy. Leadership and institutions are key to integrating and orchestrating this transformation. e-Transformation is about an economically, socially, politically, and culturally connected government. One that integrates ICT into all aspects of government reform and into the current ICT strategy for the country or region. It is about leaders who shape expectations and set governance mechanisms to continuously integrate the country's ICT strategy into governance. It is only by having as many top leaders involved that you can get a cross-sector transformation. Transformation is mostly a social learning process that requires intensive communications of shared visions, goals, objectives, and lessons learned to as broad an audience as possible so that awareness of these goals are wide spread.

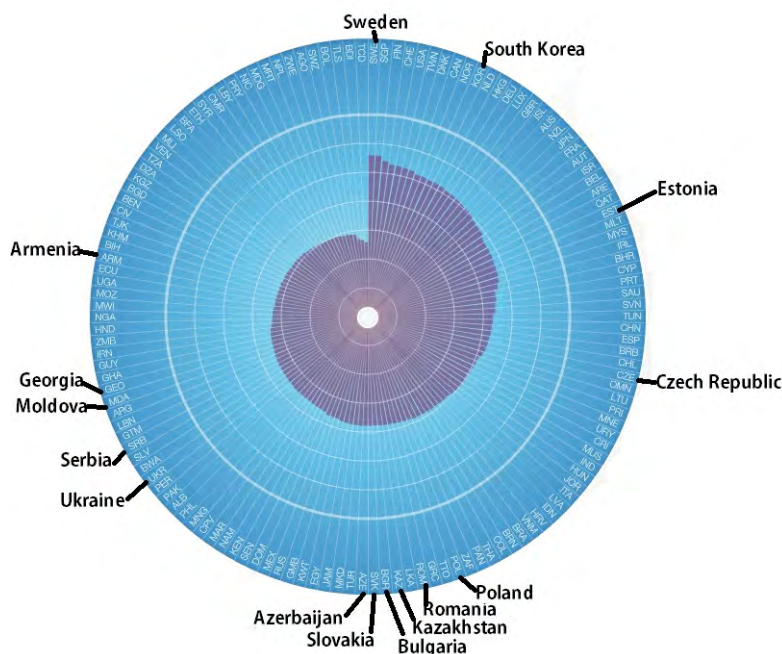
Leaders need to have a deep understanding of policy, political organizations and the social impact of ICT and of network-based competitiveness. Most importantly they should have a collaborative leadership style and be willing to work with all stakeholders. It is only by having as many top leaders involved that you can get a cross-sector transformation. Transformation is also a social learning process that requires intensive communications of shared visions, goals, objectives, and lessons learned to as broad an audience as possible so that awareness of these goals are wide spread. The research for this diagnostic has shown that only by building national consensus on the top priorities and vision within each of the highlighted countries will the required ownership and buy-in exist within each of the agencies in the respective governments. The training component part of this study could focus on these best ways of building this ownership and collaboration. Another way of doing this is through a series of stakeholder forums and discussions. These forums help to broaden and deepen the vision and also ensure that the strategy and vision created is realistic, flexible, sustainable, and responsive to the changing environment and to local needs. Stakeholder forums also provide for opportunities for new partnerships, strengthen the accountability of the participating agencies, especially as it regards efficient use of financial resources, and supports a balanced approach to the reform or transformation of Government.

Commitments and a shared vision that come from these forums helps to secure the necessary resources and government, private sector, and civil society commitment to deliver the changes



and resources needed and called for in the strategy/vision. These forums also build momentum and continuity going forward for continued changes and integration of e-Government within the country. This national shared vision should also be linked to the development & industrial priorities and visions of the country.

The network readiness Index graph that follows show the region’s need to create these broadband strategies.<sup>13</sup>



**Chart 3. Network Readiness Index**

There are some lessons as a result of this diagnostic and analysis; they are common areas of support for this region, in which training can have a specific focus:

- Support for sector reform processes, learning from other transition economies by example, for the harnessing of the potential inherent in one country that will prepare it for defining a strategic direction where broadband use is at the core. This is certainly a challenge all these countries have, and they are only able to respond more or less adequately to the challenge. It will also permit these countries to develop a forward focus to private-sector led development.

<sup>13</sup> Soumitre Dutta & Irene Mia. Network Readiness Index Explorer. The Global Information Technology Report. 2010-2011. Transformations 2.0. 10<sup>th</sup> Anniversary Edition. The NRI is a comprehensive assessment of the present state of networked readiness in the world. Moreover, a number of expert contributions focusing on the coming transformations, enabled and driven by ICT, are included. These relate to (1) the emerging Internet economy, (2) communities to be built around digital highways, (3) the promise of technology, (4) ICT’s growing impact on poverty reduction, (5) ICT’s contribution to meeting the decade’s challenges, (6) localization 2.0, (7) ICT for an effective social strategy, (8) the creation of a fiber future and its regulatory challenge, and (9) mobile banking in the emerging world.

- Support in the development of credible and mature institutions, with good governance ethics and management skills.
- Support in cross-learning success stories from one country to the next, creating an environment of collegial co-operation between them and the possibility that there may be fields of investment where they do not necessarily need to go alone.
- The possibility of greater harmonisation between the three countries. This may also be truth for other regions. It hasn't come across the diagnostic data that there are any actual efforts towards harmonisation. It is a lot easier for the countries closer to the European periphery but more difficult the farther away you are from the European sphere of influence, in institutional terms.