



# **UKRAINE**

## **ICT ENVIRONMENT, INNOVATION POLICIES & INTERNATIONAL COOPERATION**

**EECA CLUSTER**

This report is a compilation of information and data collected in the framework of the EECA cluster work. It is a part of three wider reports on EECA countries ICT priorities, Innovation Policies and Strategies and International Cooperation.

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# Ukraine

## ICT Environment

### 1 Overview of the main trends in the National ICT Sector: Ukraine

#### 1.1 Recent Trends in Macroeconomic and Market Developments

According to the Ukrainian researchers<sup>1</sup>, Ukraine's economy is a post-transformation economy which is under the influence of external factors of the globalized economy. And now it is on the way of choosing a further vector of its development.

As mentioned in the Global Competitiveness Report 2012-2013, following a protracted economic crisis, Ukraine bounces back to 73rd position in 2012-2013 year's GCI (Global Competitiveness Index). The country's competitiveness benefits notably from a healthier macroeconomic environment than in previous years. The budget deficit was cut to 2.7 percent of GDP in 2011, the debt-to-GDP ratio fell slightly, and the inflation was reduced, although it remains fairly high at almost 8 percent. Overall, Ukraine maintains its competitive strengths; these results from its large market size (38th) and a solid educational system that provides easy access to all levels of education (ranked 47th on higher education and training and 54th on primary education).

**The Main Macroeconomic Indicators of Ukraine, 2008-2012\***

Indicator	2009		2012	
		<i>Percent change from Jan.2008 to Jan.2009</i>		<i>Percent change from Jan.2011 to Jan.2012</i>
GDP in current prices, mln. of USD**	117152	-34,69%	176308	6,69%
GDP per capita, USD	2548,8	-34,43%	3870,4	6,88%
General corporate & state external debt, bln. USD	104,0	2,26%	135,06	7,02%
Inflation rate (consumer prices), percent	12,3	-44,84%	-0,2	-
Trade balance, mln. USD	- 5737,4	-69,1%	-15848,3	11,49%
Budget income, Mln.USD	35035,29	-38,04%	55681,78	11,76%
Budget expenditures, mln. USD	39454,69	32,79%	61549,36	18,12%
Unemployment rate, %	9,5****		7,2-7,7***	

\*Sources: State Committee of Statistics of Ukraine. Mode of access: <http://www.ukrstat.gov.ua/>; Indicators of the Consolidated Budget of Ukraine 2008-2012. The Ministry of Finance of Ukraine. Mode of access: [http://www.minfin.gov.ua/control/uk/publish/archive/main?cat\\_id=77643](http://www.minfin.gov.ua/control/uk/publish/archive/main?cat_id=77643).

<sup>1</sup> O. Moskalenko, Economic Policy and advanced development of Ukraine: strategic goals and international collations, [http://www.derivat.sk/files/2014%20financne%20trhy/2014\\_april\\_Moskalenko.pdf](http://www.derivat.sk/files/2014%20financne%20trhy/2014_april_Moskalenko.pdf), 28.07.2014.



\*\*By average current exchange of dollar of National Bank of Ukraine in reporting period.

\*\*\*Forecasted ([www.minfin.gov.ua/file/link/344086/file/Presentation-English.ppt](http://www.minfin.gov.ua/file/link/344086/file/Presentation-English.ppt))

\*\*\*\*World Bank (<http://www.worldbank.org/en/country/ukraine/overview>)

According to The Bleyzer Foundation, the inflation rate in Ukraine was as follows: 2008 – 16.6%; 2009 – 12.3%; 2010 – 9.1; 2011 – 6.0%; 2012 – 9.0%<sup>2</sup>.

According to the World Bank data, top concerns for Ukraine now are the developments in the Euro zone and the state of the global economy together with resolution of the political crisis in the country. Confidence in the government and the state institutions is low. Economic growth remained weak for the last two years. After five consequent quotes of economic slowdown started in the second half of 2012, Ukraine's GDP posted growth of 3.7 percent y/y in 4Q2013 driven by good harvest and low statistical base. This brought FY GDP growth to 0.0 percent (after 0.2 percent in 2012). Performance of the key sectors remained weak due to weak external conditions and delays in domestic policy adjustment. Economic growth is expected to recover slightly in 2014, however the risks for this forecast are still substantial.

According to the "Exploring Ukraine: IT Outsourcing Industry" Report, the inflation rate in Ukraine was last reported at 3.7 percent in January of 2012. Consumer prices rose 3 percent from a year earlier compared with a 3.7 percent in January. In February of 2012 inflation rate fell to its lowest level in nine years. The government is targeting a 2012 rate of inflation of less than 7.9 percent as economic growth in the former Soviet nation slowed to 3.9 percent from 5.2 percent last year.

The Report reads that Ukraine's geographical and cultural proximity to both the European Union countries and Russia, large quantity of its consumers and the physical size of the country make it an excellent location for businesses to expand locally and regionally.

Membership in WTO and a free trade agreement with the EU accelerates trade and provides another layer of protection of investments. A well-developed infrastructure, telecommunications and a legal system allow for the creation of very favorable conditions for business in Ukraine.

Recent implementation of the comprehensive Tax Code and a number of other legislative improvements are very promising steps. All these changes and measures helped to improve Ukraine's rating in the "Ease of Doing Business Index" published by the World Bank. In 2011 Ukraine was ranked 145th, which is two points higher than the previous ranking. At the same time the country has been ranked 118th, rising from 136th (+18) in the category of "Starting a Business". Ukraine is ranked 112th in this category for the year 2012, which shows a very positive trend. Business set up in the country is becoming simpler and easier.

## Recent Trends in ICT Performance

According to the State Service of Statistics of Ukraine as for July 2013:

- There are 3292 institutions in Ukraine which main activity is providing IT services. They include about 1000 IT institutions which gross revenue exceeds 1 mln. UAH and which have 62 400 jobs.
- The total number of IT specialists in Ukraine exceeded 215 000 persons.
- The gross revenue of the IT institutions exceeded 12 bln, UAH in 2012.

ICT sector in Ukraine is composed of the following elements:

- 2114 certified ICT operators;
- 1482 legal entities which provide access to the Internet;

<sup>2</sup> SigmaBleyzer, *Ukraine: Macroeconomic Situation*, [http://www.sigmableyzer.com/wp-content/uploads/Ukraine\\_EU\\_11\\_01\\_11.pdf](http://www.sigmableyzer.com/wp-content/uploads/Ukraine_EU_11_01_11.pdf), 28.07.2014.



- 43.5% citizens of Ukraine who have access to the Internet;
- 148 universities which train ICT specialists;
- Almost complete coverage of the territory of Ukraine by mobile communication.

Profits of the ICT sphere made 23% of total profits of the services sphere in 2012 and exceeded the profits in 2011 by 6.7%. Export and import of ICT services raised by 49.3% and 22.4% correspondingly.

Ukraine is 62<sup>nd</sup> in the world rating on use of ICT rising by 40 positions for the last three years.

Ukrainian universities train a large numbers of highly qualified specialists in information and communication technologies, mathematics, and cybernetics. 46 967 persons is the total number of licensed students for ICT. Annually the Ukrainian universities have about 20 thousand ICT graduates.

Ukraine is one of the biggest exporters of IT services in the world and has the highest revenues from the outsourcing market in Europe (around 800 million USD in 2010). The country has an enormous pool of IT specialists; only USA, India and Russia are ahead.

According to *EAST-INVEST* review<sup>3</sup>, the ICT sector of Ukraine is very promising. Recognising the country's highly skilled workforce and its comparatively lower costs, A.T. Kearney ranked Ukraine 38th in its Global Services Location Index of the best destinations for outsourcing activities.

According to the "Exploring Ukraine: IT Outsourcing Industry" Report, the following were main trends of the Ukraine's software development and IT outsourcing service industry in 2011:

- During the last decade Ukraine has been the leading provider of software development and IT outsourcing services in the Central and Eastern European region (excluding Russia). Ukraine is ranked first in the volume of IT outsourcing and software development services provided, in the number of IT specialists working in the industry, and in the number of IT graduates;
- The post crisis effects have been overcome, the industry is developing at a rapid pace of 20-25% growth a year while new companies are opening their R&D offices in Ukraine. After the recent tax exemption legislation for software development companies has been accepted, such global vendors as Google, Microsoft, Samsung, and Huawei expressed interest in establishing R&D centers in Ukraine;
- The trend of consolidation is still observed in the market today. Prior to recession market consolidation was mainly based on mergers and acquisitions. The post-crisis consolidation, however is based on the rapid growth of large companies, which pressure the labor market by means of increasing salaries for IT specialists;
- The industry actively penetrates into different regions. All leading companies are extending their office networks to the main regional centers. A range of new companies appeared in so called "unpopular" regions. These are fairly large industrial and cultural centers such as Chernigiv, Kirovograd, Ivano-Frankivsk, Sumy, Ternopil, Zhitomyr, Luhansk, Lutsk, Poltava, Khmel'nitskiy, where there were no appreciable companies until recently;
- Ukraine still boasts the most impressive gap in Europe between GDP per capita in the country and GDP per capita in the software development industry. This could be an important economic incentive for specialists and businessmen to enter the profitable and well-paid market of software development and IT outsourcing services.

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<sup>3</sup> Ukraine ICT Sector Outlook, <http://www.east-invest.eu/en/Investment-Promotion/ukraine-2/UA-ICT>, 28.07.2014.

The Report reads that by the end of 2011 there was a good coverage of high-speed Internet access in Ukraine. Five national providers of fixed (DSL, ADSL, XDSL) internet access — Ukrtelecom, Vega Telecom, Datagroup, Ukrnet, Volia, and 5 national operators of mobile internet — MTS, Kyivstar, PEOPLEnet, Utel, and Intertelecom are currently operating in Ukraine. Every regional center and large district center has a number of local providers and home networks.

Ukraine's software development and IT outsourcing service industry is the largest in Central and Eastern Europe. Ninety-percent of the industry is oriented towards external markets. The large number of highly skilled IT professionals fuels a robust industry focused on delivering quality, reliable IT services to global markets. Strong experience and qualifications, and a client-oriented approach, coupled with their relatively low cost, have created high demand for Ukrainian programmers. The deep involvement of Ukrainian developers in a client's projects allows the client to more easily and cost-effectively achieve the results desired.



Experts agree that the industry will continue to grow rapidly for the foreseeable future. In fact, according to the optimistic estimates of experts, the Ukrainian market will grow tenfold, and the volume of software development and IT outsourcing services may reach US\$10 billion by 2020.

### **Objectives and Targets of National ICT Policy**

In the framework of the former Soviet Union Ukraine had developed a strong tradition in the fields of cybernetics, mathematics and computer science. Ukrainian engineers, scientists and programmers have been engaged in large-scale complex projects for forty years, cutting across various technology disciplines. Following this tradition, over the past few years Ukraine has rapidly become a strong player in software engineering and IT business services, having as major advantages the up-to-date technical skills and education of its workforce.

The use of modern ICT facilities is conditioned by the following:

- raise of expenditure to develop complex technological systems;
- raise of labour efficiency;
- new management tendencies;
- growing importance of informational factor in the economy;
- raise of ICT products share in the economy;
- transfer to the world and European standards in the economy.

The main advantages of the Ukrainian IT market are the following:

- competitive labour costs, coupled with opportunities to decrease payroll taxes;
- highly qualified staff: confident knowledge of research and development, as well as well-experienced in the development of integrated programs and applications;
- favourable geographical location;
- governmental support of the development of IT industry in Ukraine.



Over the last decade Ukraine has gained huge interest from the western countries for provision of outsourcing services in the areas of information technology.

In view of the information society development the Ukrainian industries are now recognizing the need for investment in IT solutions in order to improve their performance. Leaders in this trend are public health, industry/production, human services, trade, transport, telecommunications, scientific research institute/education, finances/insurance, mass communication media/publishers.

More Government support is needed in the Ukrainian IT industry, in order to give domestic companies a competitive edge on the global market and a lot of areas in the ICT sector still remain underinvested. However the Government is aware of the needs of the sector and has started placing high priorities in its policies concerning the ICT development of the country.

The current pace of industrial development and the global economic situation according to some experts will most likely allow Ukraine to achieve \$10 billion mark in annual IT exports by 2018.

The main clusters of Ukrainian IT industry are IT outsourcing and software development as well as systems integration. Market experts expect that the volume of Ukrainian IT market will continue to increase, both with respect to domestic sales and export of IT services.

The Ministry of Infrastructure of Ukraine, the Ministry of Education and Science of Ukraine, the National Commission for the State Regulation of Communications and Informatization of Ukraine, the State Agency for Investment and National Projects of Ukraine and the National Academy of Sciences of Ukraine are the key actors at the policy level and are overall responsible for the national ICT sector development. However the sector is under structural changes now.

The main strategic targets of information society development in Ukraine include the following:

- acceleration of development and implementation of up-to-date competitive ICT in all fields of social life, in particular in economy and governmental institutions activities;
- ensuring computer and information literacy of the population, primarily by creating an education system that extensively uses modern ICT equipment;
- development of the national information infrastructure and its integration into world infrastructure;
- public maintenance of the new “electronic” economic sectors (commerce, finance and bank services etc);
- creation of the nationwide information systems, primarily in the sphere of health, education, science, culture and environment protection;
- preservation of Ukraine’s cultural heritage through the use of e-documenting;
- extension of ICT use for state management, relations between state and population, e-forms of interaction between public authorities/institutions and physical persons;
- attraction of all regions in participation of formation of the information oriented society in the way of decentralization and approval of regional and local initiatives;
- development of data protection for citizens;
- improvement of information security through the use of up-to-date ICT equipment and services.

Currently, the national ICT policy development is mainly focused on the following areas:

- improving the implementation and performance of projects within the National Programme of Informatization;
- creating a favourable investment climate for ICT developments;



- supporting the advanced basic and applied research and knowledge based technologies;
- supporting development of the domestic software industry and ICT manufacturing industry;
- developing national, branch and regional information systems, networks and e-resources, information and analytical systems of executive authorities and local government institutions.

### Annex 1: Overview of ICT Policy Documents

Main policy documents concerning ICT policy adopted/published since 2010-2011

Title of document (in English)	Date (of approval, publication, etc.)	Organisation responsible (Ministry, etc.)	Legal status (Law, Government Decision, strategy (white) paper, action plan, etc.)
On Scientific and Scientific and Technical Activities	13 December 1991 (last update 08 September 2011)	Verkhovna Rada	Law
On Scientific and Technical Information	25 June 1993 (last update 27 March 2014)	Verkhovna Rada	Law
On the Concept of the National Programme of Informatization	1998 (last update 04 July 2013)	Verkhovna Rada	Law
On Priority Areas of Science and Technology Development	11 July 2001 (last update 16 October 2012)	Verkhovna Rada	Law
On the Main Principles of the Information Society in Ukraine for 2007-2015	2007	Verkhovna Rada	Law
On Protection of Personal Data	01 June 2010	Verkhovna Rada	Law
On Approval of the Action Plan to Realize the Tasks Set by the Law of Ukraine "On Main principles of the Information Society in Ukraine in 2007-2015"	2007	Cabinet of Ministers	Edict
On Approval of the Concept of E-governance Development in Ukraine	13 December 2010	Cabinet of Ministers	Edict

## Annex 2: Overview of ICT Policy Measures

IPM Number	Title of measure	Overview
1	The National Programme of Informatization (1998; updated on a regular basis; the period is not defined)	<p>The document was developed by the <b>State Agency for Science, Innovations and Information</b> following the Law of Ukraine “On the National Program of Informatization” and the Regulations on forming and implementing the National Program of Informatization.</p> <p>The National Program of Informatization is a complex of correlated separate tasks (projects) of informatization, which aim to realize the government policy and priority vectors of building a modern information policy.</p> <p>The main results of the implemented tasks of the program will be: hardware-software complex of managing the National system of indicators (indexes) of knowledge society development; a new version of the hardware-software complex of the National register of electronic information resources, register model of software used by the governmental institutions; findings revealing the compliance of the Program tasks to the priority vectors of the state policy in the field of informatization and to the high-end level and trends of informatization development in the world.</p>
2	The Concept of e-Government in Ukraine until 2015	<p>According to <b>the State Agency for Science, Innovations and Information of Ukraine</b>, a common information and telecommunications infrastructure of central and local government agencies will be established until 2015 as part of the third stage of electronic government development. The concept of electronic government was approved by the Cabinet of Ministers of Ukraine. Under the concept, the first stage (until 2012) foresees the development of legal and regulatory framework required for the provision of administrative services electronically, the creation of common standards for interaction between the subjects of e-government and a common national system of electronic document circulation, as well as the provision by central and local government agencies of services to citizens electronically. The second stage (until 2014) foresees that services will be provided in electronic form in all spheres of public life.</p>
3	The Strategy for Development of Information Society and Informatization (approved in 2013; until 2020)	<p><b>The National Commission for the State Regulation of Communications and Informatization of Ukraine</b> developed and adopted by the Decision No. 609 dated 22.11.2012 the Draft Law of Ukraine "On Amending the Law of Ukraine "On Main Principles of Information Society Development in Ukraine for 2007-2015" in order to improve the quality of life, creation of wide opportunities to satisfy needs and the free development of personality, to ensure the competitiveness Ukraine, development of economic, social, political, cultural and spiritual areas of public life, improve governance through the use of ICT, warning of threats that arise in the Information Society.</p>

## 1.2 Recent National Policy Trends

### ICT Policy Measures

IP N°	Title	Organisation responsible
1	Open World National Project (period is not defined)	Open World Project provides creation of a national information and communication network based on technology 4G, which will be used primarily for the purpose of school education. Implementation of this project will serve as an example that Ukraine can be in the forefront of world innovations. Today only a small part of Europe covered by this technology, which allows carry out electronic certification, voting, singular cadastral system, electronic tax administration, coordination of traffic system, rescue system and so on. And the most important is that, this system radically will improve the quality of education in the country and ensure effective integration of the Ukrainian education into European educational system. In the framework of the project 1.5 million schoolchildren will receive net books, Ukrainian educational software and Internet access. The project significantly enhances the general competitiveness of Ukrainian society and provides the conditions for future technological and innovative breakthrough.
2	Timely Help National Project (2013)	The Projects provides for modernization of ambulance according to the world standards
3	RCI (Regional Competitiveness Initiative) Project (2004-2013)	The web platform IT2Business ( <a href="http://it2business.org/default.aspx">http://it2business.org/default.aspx</a> ), an online catalogue with successful practices and Information Technology (IT) solutions for the business, is aimed at increasing the ICT competitiveness in Eastern Europe and Caucasus. The platform is designed and launched by USAID funded RCI (Regional Competitiveness Initiative) project through European Software Institute - Center Bulgaria and Eastern Europe to bring together the leading ICT companies in the region and their customers and suppliers. It fosters the direct contact between IT and other economic sectors. This enables the promotion of the local industry and the region as a whole. Currently there are 64 companies and 148 products/solutions registered in the platform. Two Ukrainian companies are part of the online IT2Business catalogue.
4	Integrated State Portal of Administrative Services (until 2015)	The pilot project of the Ministry of Economic Development and Trade of Ukraine is a part of the e-governance programme. This is a strategic task to develop interface "government-citizen".

### Lessons from the Evaluation of ICT Policy Measures

The recent (2013) SWOT analysis of Ukrainian ICT environment carried out by ESI Center Eastern Europe within a USAID funded project shows conclusions as follows:

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Companies are already aware of internationally recognized quality standards and models</li> <li>• Awareness of the need for software process improvement</li> <li>• Availability of resources and well qualified IT specialists</li> <li>• R&amp;D focus of Ukrainian IT industry</li> <li>• Strong fundamental education</li> <li>• Experience with complicated projects</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of cooperation between business support organizations</li> <li>• Lack of real statistics regarding market development</li> <li>• Lack of business and management skills</li> <li>• Absence of joint international marketing initiatives</li> <li>• Lack of financial resources for IT companies</li> </ul>

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Export-oriented industry</li> <li>• The country has the image of an attractive outsourcing destination</li> <li>• Naturally developed industry around centers of excellence in Kyiv, Kharkiv, Donetsk, Lviv, Dnipropetrovs'k</li> <li>• Government support of the IT industry development</li> <li>• Favourable geographic position</li> <li>• Competitive labour costs</li> </ul>	
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Implementation of world recognized models and practices</li> <li>• The IT industry has great potential for development</li> <li>• The government is interested in software process improvement methodologies</li> <li>• Existence of funds, which are available for investing in software companies</li> <li>• Support of world organizations</li> <li>• Large emerging global IT market for offshore development</li> <li>• Development of own products</li> <li>• Clustering with other competitive sectors in Ukraine and the region</li> <li>• Large internal market</li> <li>• Increased collaboration between EU and Ukrainian ICT companies</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of a domestic market to enable the local IT industry to develop expertise</li> <li>• Lack of support programmes for industry promotion</li> <li>• Lack of a coherent industry image</li> <li>• Political instability</li> <li>• Brain drain of leading IT specialists</li> </ul>

The National Commission for the State Regulation of Communications and Informatization of Ukraine developed and adopted by the Decision No. 609 dated 22.11.2012 the Draft Law of Ukraine "On Amending the Law of Ukraine "On Main Principles of Information Society Development in Ukraine for 2007-2015" in order to improve the quality of life, creation of wide opportunities to satisfy needs and the free development of personality, to ensure the competitiveness Ukraine, development of economic, social, political, cultural and spiritual areas of public life, improve governance through the use of ICT, warning of threats that arise in the Information Society.

The proposed changes include, in particular:

- adjustment of key strategic goals, mechanisms and legislative support for information society development in Ukraine for the period up to 2020, based on the current situation of its development;
- need to improve the national system of indicators of evaluation of information society development;
- introduction of new principles of the information society development, taking into account forming of models of consumption and production;
- determination institutional support for coordination activity of state bodies on the information society development;
- need to create of national cyber security.



One of the main priorities of Ukraine, defined by the Law of Ukraine “On general principles of the Information Society development in Ukraine for 2007-2015”, is the striving to build Information society in focuses on the interests of people, opened for everyone and directed on the development of Information society where everyone could create and collect information and knowledge, have free access to them, use and change them, to enable everyone to realize his potential, promoting social and individual development and improving the quality of life.

### Review of Good Practice - Summary of good practice cases in Ukraine

Year	Title of good practice case	Justification for selection
2010	Providence Equity Partners (USA)	In 2010, it acquired the Ukrainian operations of FiberNet. These assets include SDS Falstap, the largest cable operator in Dnipropetrovsk.
2011	EPIC (Austria)	EPIC (Austria) is the investment house which acquired a 92.79% stake in Ukraine’s largest landline telephone provider Ukrtelecom in 2011 for USD 1.3 billion.

### Updated National ICT R&D priorities towards H2020

Topics-areas
<b>ICT in ‘Excellent science’</b>
<b>Research infrastructures</b>
Development, deployment and operation of ICT-based e-infrastructures
<b>ICT in ‘Leadership in Enabling and Industrial Technologies’</b>
<b>A new generation of components and systems</b>
Smart System Integration
<b>Future Internet</b>
Tools and Methods for Software Development
FIRE+ (Future Internet Research & Experimentation)
<b>Content technologies and information management</b>
Big data - research
Technologies for better human learning and teaching
<b>Micro- and Nano-electronic technologies, Photonics</b>
Generic micro- and Nano-electronic technologies
<b>Factories of the Future</b>
ICT-enabled modeling, simulation, analytics and forecasting technologies
<b>ICT in ‘Societal challenges’</b>
<b>SC1: Health, demographic change and wellbeing</b>
<i>Improving health information, data exploitation and providing an evidence base for health policies and Regulation</i>
Digital representation of health data to improve disease diagnosis and treatment



## Innovation Policy

The importance of innovation is recognized in many legal and policy documents, including at the highest level. However, a holistic consideration of the national innovation system, its various components and the relations between them, remains lacking. A narrow interpretation of innovation, which emphasizes technological aspects, prevails. The subsystems of science and innovation intermediaries receive greater policy attention, but there is less emphasis on the need to encourage innovation in the business enterprise subsystem, particularly with regard to SMEs as an important driver of economic dynamism. There is insufficient consideration of linkages between subsystems, including between the science and business sectors, which are key for the definition of a science, technology and innovation strategy.

There have been multiple innovation-related initiatives in Ukraine over recent years, reflecting the continued importance attached to innovation as a driver of growth and competitiveness. However, many of the legal and policy documents remain at a conceptual level, with insufficiently defined practical policy measures or instructions for further implementation.

Access to international knowledge will continue to play a critical role in the modernization of the Ukrainian economy. External markets can provide the necessary demand for innovative Ukrainian companies. Facilitating participation in the global networks through which information flows and ensuring that researchers, students and companies have full access to international cooperation mechanisms help create the framework conditions for innovation to flourish.

Ukraine is a lower middle income economy, according to the World Bank classification, and it has a well-educated labour force and a large domestic market.

The structure of innovation governance starts from **the Parliament (Verkhovna Rada)** of Ukraine which primarily approves the regulatory framework within which the science and technology system operates. In addition, Parliament is required to define the basic principles and directions of public policy in the fields of innovation and technology activity, and approve priority directions of national goal-oriented programmes of S&T and innovation development. Two committees within Parliament are especially important for formulating and implementing R&D and innovation policy: the Committee on Education, Science and Innovation and the Committee on the Budget.

The Cabinet of Ministers of Ukraine exercises control over the establishment and operation of the public administration system in the fields of science, technology and innovation, and determines priorities in S&T and innovation. It also develops strategies for science, technology and innovation development, and considers proposals from the ministries regarding the effective use of funds from the State Budget of Ukraine, in order to improve the system of science administration, training and certification.

There is no single ministry, agency or other body responsible for coordinating research policy in Ukraine. The key ministry responsible for STI policy is the Ministry of Education and Science of Ukraine (MESU). The National Academy of Sciences of Ukraine, along with MESU, is a key player in decision-making on science policy. These organizations along with the Ministry of Economic Development and Trade of Ukraine (MEDTU) are able to formulate science policy.

It is important to note that currently the governmental structure undergo several changes. Ukraine has conducted two surveys of innovation activities that follow the EU Community Innovation Survey methodology. The latest survey was carried out in 2011, covering the period



2008-2010. In comparison with the first survey covering 2006-2008, the share of innovative enterprises grew by three percentage points to 21%. This was a result of an increase in the number of enterprises introducing organizational and marketing changes, which was the most prevalent form of innovation, involving 13% of all enterprises. By contrast, there was a decline in the number of companies engaged in technological innovation.

According to the Global Competitiveness Report, Ukraine is considered to be at the efficiency-driven development stage, where innovation and sophistication factors have a still limited role in determining the value of the overall competitiveness index in comparison with more advanced economies. The Report shows that there is some limited improvement regarding technological readiness, which provides an assessment of the economy's ability to absorb existing technologies. Ukraine moved from 83rd position in the 2010-2011 report to 81st in 2012-2013.

There are two main factors which positively influence innovation activities within the national innovation system: the free market and entrepreneurship. It is important that policies support the creation of an environment that reinforces market efficiency and entrepreneurship for both the business and the science sectors.

In December 2005, the European Union (EU) announced that it recognized Ukraine as a market economy. Ukraine has preserved significant scientific resources as a legacy from the planned economy, although many lack a clear commercial orientation under the market conditions.

Barriers to innovation mentioned by industrial enterprises in their reporting forms to the State Statistics Committee of Ukraine were: lack of own finances (80.1% of industrial enterprises); up-front costs of innovation (55.5%); insufficient state financial support (53.7%); economic risk (41.0%); poor legal base (40.4%), length of time before return on investment (38.7%); and customers' lack of financial resources (33.3%). In addition, 20.0% of enterprises cited lack of qualified personnel; 19.7% – lack of cooperation with research institutes / other enterprises; 17.4% – lack of information about consumer markets; 17.3% – lack of information about innovative products; 16.0% – low demand for innovation; and 15.5% – unwillingness of the enterprise itself to innovate.

The two main pillars of the academic research and development system are the Academies of Sciences and the so-called branch institutes, a legacy of the centrally planned system. The system of the National Academies of Sciences of Ukraine comprises six state academies of sciences: the National Academy of Sciences, National Academy of Agrarian Sciences, National Academy of Medical Sciences, National Academy of Pedagogical Sciences, National Academy of Legal Sciences and the National Academy of Arts. Approximately 75% of the National Academies' potential resides within the National Academy of Sciences of Ukraine, although the Academy has more than 200 research establishments, largely in the areas of natural and technical sciences. Institutes from the National Academy of Sciences have often formed the basis for Ukraine's most successful technoparks.

The research activity of the Academy is financed largely by the state.

The Academy is independent of the Ministry of Education and Science, but coordinates its activities with the Ministry. Additionally, the Ministry invites representatives of the Academy when it launches any programme for fundamental research. The Academy has a strong voice in the State Fund for Fundamental Research, while the research institutes of the National Academy of Sciences remain a major source of scientific and technological potential in Ukraine. A number of successful innovative enterprises have emerged as spin-offs from the institutes.



According to the results of implementation of the National Programme for Promotion of Small Entrepreneurship Development in 2010, Ukraine has the following business support infrastructure organizations:

Organization types	Number
Business centre	440
Business incubator	70
Technopark	41
Leasing centre	795
Investment and innovation centre	3168
Information and consulting organization	3157
Entrepreneurship support fund	252

Below is the structure of expenditures on innovation (by source) as given by Igor Yegorov in *Background paper on innovation policy in Ukraine (2012)*:

Year	Company resources	State and local budgets	Non-budget funds	Bank loans	National investors	Foreign investors	Other sources
2008	60.6	2.9	0.0	33.7	1.4	1.0	0.4
2009	65.0	1.7	0.0	11.8	0.4	19.0	2.0
2010	59.4	1.2	0.0	7.8	0.4	29.1	1.3
2011	52.9	1.1	0.0	38.3	0.3	0.4	6.9

The State Statistics Service of Ukraine provided information on the indices of innovation activities in industry of Ukraine (as for 2012), which are the following:

Number/Year	2008	2009	2010	2011	2012
<b>Number of innovative enterprises/% to total number of industrial enterprises</b>	1379/13.0	1411/12.8	1462/13.8	1679/16.2	1758/17.4
<b>Number of enterprises that apply innovation/% to total number of industrial enterprises</b>	1160/10.8	1180/10.7	1217/11.5	1327/12.8	1371/13.6
<b>Total amount of financing of innovation, mln.UAH</b>	11994.2	7949.9	8045.5	14333.9	11480.6

In spite of positive dynamics, the average number of innovative enterprises in EU-27 is four times higher to the number in Ukraine.

An important factor of innovative profile of any country is its presence in reports and indices which identify technological and innovative competitiveness of a country. Ukraine is presented in the following ones:

- World Economic Forum (WEF)
- World Bank
- INSEAD and World Intellectual Property Organization (WIPO)

The global competitiveness index WEF integrates 117 sub-indices. According to WEF, Ukraine was 73<sup>rd</sup> within 144 countries with the global index and 71<sup>st</sup> within 144 countries with the sub-index "Innovation" in 2012.



According to the Knowledge Economy Index of the World Bank Institute, Ukraine was 56<sup>th</sup> with 145 countries in 2012.

And the Global Innovation Index of INSEAD and WIPO, which gives information on a country's ability to create favourable innovative environment and innovation activities placed Ukraine as 63<sup>rd</sup> with 142 countries in 2012.

### Annex 3: Overview of Innovation Policy Documents

#### Main policy documents concerning Innovation policy adopted/published since 2010-2011

Title of document	Date	Organisation responsible	Legal status
On Special Regime for Innovation Activity in Technological Parks	July 16, 1999 (last update November 2, 2010)	Verkhovna Rada	Draft Law
On Innovation Activity	July 4, 2002 (last update October 16, 2012)	Verkhovna Rada	Law
On Priority Areas of Development of Innovation Activity in Ukraine*	January 16, 2003 (last update October 16, 2012)	Verkhovna Rada	Law
On State Target Programs	March 18, 2004 (last update 16 October 2012)	Verkhovna Rada	Law
On the State Regulation of Activity in the Sphere of Technology Transfer	September 14, 2006 (last update October 2, 2012)	Verkhovna Rada	Law
On Scientific Parks	June 25, 2009 (last update October 16, 2012)	Verkhovna Rada	Law

\*It is important to note that Ukraine was the first of ECA countries to legally define the concept of innovation culture (2003), which is referred to as «a component of innovation potential characterizing the level of educational, overall cultural, social and psychological readiness of a person and society as a whole to accept and creatively implement the ideas of economic development on the basis of innovation». In addition, the Verkhovna Rada set «the development of innovation culture of society» as one of the strategic priority directions of innovation activities of Ukraine.

### Annex 4: Overview of Innovation Policies

#### Policy Measure Fiche: overview

IP Number	Title of measure	Overview
1	National Programme for Promotion of Small Entrepreneurship Development in Ukraine	<p>The Programme sets the following objectives:</p> <ul style="list-style-type: none"> <li>• Improvement of the normative and legal base in the sphere of entrepreneurial activities</li> <li>• Formation of a single state regulatory policy in the sphere of entrepreneurship</li> <li>• Improvement of financial, credit and investment support of small enterprises</li> <li>• Promotion of creation of infrastructure for small enterprise development</li> <li>• Implementation of regional policy to promote small enterprise development.</li> </ul>

IP Number	Title of measure	Overview
		<ul style="list-style-type: none"> <li>This is a framework document in accordance with which regional programmes are elaborated and approved by regional authorities every two years.</li> </ul>
2	Strategy for innovation development of Ukraine for 2010-2020 in conditions of global challenges	The document discusses information of status, challenges and strategic perspectives of scientific, technologic and innovative development of Ukraine as well as innovative policies of other countries.
3	State Target Programme for the Development of the System of Information and Analytical Support of the State Innovation Policy Implementation (2008 – updated on a regular basis)	The key goal of the programme is to create effective instruments of monitoring of the state innovation policy at the level of central government and on the level of regions. Initially, there were plans to establish special groups at the state and regional levels, which could collect data, conduct surveys and prepare analytical materials on the situation in innovation sphere. These groups were to work under the guidance of the Ministry of Economic Development and Trade of Ukraine. Some basic instruments for assessing innovation activities were developed and proposed to the MEDTU.
4	State Target Programme “Creation of Innovation Infrastructure in Ukraine” (2009-2013)	The government hoped to attract investors to create technology transfer centres for small businesses within this Programme. Private companies were to benefit from the use of newly-created elements of infrastructure through the provision of various services and products to innovation companies and by obtaining certain privileges, including access to cheaper (subsidized) bank loans, information and expertise from state research centres.

## International Cooperation

Since 1991, when Ukraine gained independence, the European Union and Ukraine have developed an increasingly dynamic relationship.

An important element of this status makes STI cooperation agreements concluded by the Government of Ukraine and the governments of EECA countries (see Table 1). The agreements are based on the possibilities to 1) define joint STI priorities; 2) define and select the forms of joint STI activities; 3) provide public support to joint scientific research and designs; 4) form intergovernmental programmes; 5) regulate creation and exploitation of the scientific facilities of joint use; 6) cooperate in training of university students, scientists and researchers; 7) protect IPR and 8) exchange STI information.



**Table 1: Overview of bilateral Ukraine-EECA agreements**

Title of document	Date	Country/Organisation	Scope of cooperation
Agreement between the Government of Ukraine and the Government of Republic of Armenia on Scientific and Technical Cooperation	1998	Armenia – Ukraine/ Governments	Agreement on Scientific and Technical Cooperation
Agreement between the Government of Ukraine and the Government of Azerbaijan Republic on Scientific and Technical Cooperation	1998	Azerbaijan – Ukraine/ Governments	Agreement on Scientific and Technical Cooperation
Science and technology Cooperation program	2013-2017	Azerbaijan - Ukraine/ Innovations and Informatization of Ukraine - Innovation Centre of ANAS, State Agency on Science	Cooperation programme
Agreement on cooperation in science, studies	2013	Azerbaijan - Ukraine / National University of Kyiv, Shamakhy Astrophysical Observatory	Agreement on cooperation
Agreement on cooperation	2013	Azerbaijan - Ukraine / Ukrainian Union of Industrialists and Entrepreneurs - Institute for Petroleum Chemical Processes of ANAS	Agreement
Agreement on joint cooperation	2013	Azerbaijan - Ukraine / Institute of	Agreement on joint

Title of document	Date	Country/Organisation	Scope of cooperation
		Mathematics of National Academy of Sciences of Ukraine - Institute of Mathematics and Mechanics (ANAS)	cooperation
Agreement on cooperation	2013	Azerbaijan - Ukraine / Institute of Mathematics and Mechanics (ANAS), I. Franko National University of Lviv	Agreement on cooperation
Memorandum of understanding for technical cooperation	2012	Azerbaijan - Ukraine / Institute of Radiation Problems (ANAS), State Scientific and Research Institution "Chornobyl Center For Nuclear Safety, Radioactive Waste and Radioecology	Memorandum of understanding
Agreement on cooperation	2011-2015	Azerbaijan - Ukraine / Social Studies of MV Ptuzhi National Academy of Sciences of Ukraine - Institute of Economy (ANAS)	Agreement on cooperation
Memorandum on scientific cooperation	2011	Azerbaijan - Ukraine / MASMI of Ukraine - Institute for Petroleum Chemical Processes of ANAS	Memorandum
Belarus-Ukraine Intergovernmental Commission on Cooperation in the field of Science and Technology		Belarus – Ukraine	Intergovernmental Commission
Contest of Joint Belarusian-Ukrainian Scientific-Technical Projects for the Period from 2011 to 2013	2011-2013	Belarus – Ukraine	Joint call of scientific projects
Agreement between the Government of Ukraine and the Government of Republic of Belarus on Scientific and Technical Cooperation	1992	Belarus – Ukraine/ Governments	Agreement on Scientific and Technical Cooperation
Agreement between Georgian and Ukrainian Governments for the collaboration in the field of communication technologies.	April 13, 1993	Georgia – Ukraine / Ministry of Economy and Sustainable Development	Agreement for the collaboration in the field of

Title of document	Date	Country/Organisation	Scope of cooperation
			communication technologies / Working groups
Agreement between the Government of Ukraine and the Government of Republic of Georgia on Scientific and Technical Cooperation	1993	Georgia – Ukraine/ Governments	Agreement on Scientific and Technical Cooperation
Agreement between the Government of Ukraine and the Government of Republic of Kazakhstan on Cooperation in the Fields of Science and Technology	1995	Kazakhstan – Ukraine/ Governments	Agreement on Cooperation in the Fields of Science and Technology
Agreement on cooperation on education and science.	September 14, 2010	Kazakhstan-Ukraine	Agreement on cooperation
Agreement between the Government of Ukraine and the Government of Kyrgyz Republic on Cooperation in the Fields of Science and Technology	1996	Kyrgyz Republic – Ukraine/ Governments	Agreement on Cooperation in the Fields of Science and Technology
Agreement between the Government of Ukraine and the Government of Republic of Moldova on Cooperation in the Fields of Education, Science and Culture	1995	Moldova – Ukraine/ Governments	Agreement on Cooperation in the Fields of Education, Science and Culture
Agreement between the Government of Ukraine and the Government of the Russian Federation on Science and Technical and Economic Cooperation in the Field of Nuclear Energy	1993	Russia – Ukraine / Governments	Agreement on Science and Technical and Economic Cooperation in the Field of Nuclear Energy
Agreement between the Government of Ukraine and the Government of the Russian Federation on Cooperation in the Fields of Culture, Education and Science	1995	Russia – Ukraine/ Governments	Agreement on Cooperation in the Fields of Culture, Education and Science
Shota Rustaveli National Science Foundation and Science and Technology Center in Ukraine (STCU) jointly announce the 2014 call for proposals within the framework of the Targeted Research & Development Initiatives (TRDI) Program in the following priority areas:	2010-2014	Georgia –Ukraine / Science and Technology Center - Shota Rustaveli National Science Foundation	Joint Calls

Title of document	Date	Country/Organisation	Scope of cooperation
1. Biotechnologies and Life Sciences 2. New Materials and Nanotechnologies 3. ICT			
Agreement between the Government of Ukraine and the Government of Republic of Uzbekistan on Cooperation in the Fields of Science and Technology	1995	Uzbekistan – Ukraine/ Governments	Agreement on Cooperation in the Fields of Science and Technology

### ICT policies and programmes facilitating co-operation with the EU

Ukraine is a priority partner country within the European Neighbourhood Policy (ENP) and the Eastern Partnership. The current legal framework for EU-Ukraine relations is provided by the Partnership and Co-operation Agreement (PCA). The ambitions of both the EU and Ukraine to enhance their relationship created an opportunity to move beyond cooperation towards gradual economic integration and deepening political association.

Therefore, in March 2007 negotiations on a new EU-Ukraine Association Agreement were launched. They have been finished in December 2011. The new agreement envisages among others Political Association and Economic Integration of Ukraine to the EU. On 21 March 2014, European Union Heads of State and Government and Ukrainian Prime Minister signed the political provisions of the EU-Ukraine Association Agreement.

The European Union and Ukraine share an objective which transcends bilateral cooperation: gradual progress towards political association and economic integration. Ukraine is a key partner in the Eastern Partnership, a facet of European Neighbourhood Policy. Since 1998 the Partnership and Cooperation Agreement has enabled the EU and Ukraine to cooperate with one another on all major aspects of reform.

It is to be replaced by the Association Agreement, including a Deep and Comprehensive Free Trade Area, the political section of which was signed on 21 March 2014. On 5 March 2014 the European Commission agreed on a financial assistance package of at least EUR 11 bn in loans and grants from the EU budget and EU-based international financial institutions, to:

- help stabilise Ukraine's economic & financial situation;
- support transition;
- encourage political & economic reforms;
- support inclusive development.

Ukraine is classified in FP7 as an International Cooperation Partner Country (ICPC). Researchers and research entities from Ukraine, like other ICPCs, can participate in FP7 following the regulation of this Programme. Successful Ukrainian research entities may receive EU funding on the same basis as research entities from the EU Member States/FP7 Associated Countries. Ukraine is in the top ten of the most active (non-associated) third countries participating in the programme.



Ukraine concluded agreements on STI cooperation on the governmental level with the corresponding ministries of 22 EU-members and associated states: Germany, France, Italy, Greece, Poland, Hungary, Slovenia, Bulgaria, Romania, Slovakia, Estonia, Latvia, Lithuania, Austria, Spain, Portugal, Finland, Croatia, Macedonia, the Czech Republic, Cyprus, and Turkey.

The National Academy of Sciences of Ukraine (NASU) is the highest state-supported research organisation, enrolling academicians, corresponding members and foreign members. It integrates all researchers of its institutions and carries out studies in various branches of knowledge, develops scientific fundamentals for technological, socio-economic and cultural advancement of the nation.

NASU endeavours to advance international scientific ties and further integration into the world academic community. Academy institutions are engaged in quite a number of joint research projects under direct bilateral agreements with foreign research institutions and those financed by grants provided by numerous international science foundations and programmes.

NASU concluded agreements and set up intellectual contacts with research centres in more than 50 countries of Europe, Asia and the Americas.

The State Fund for Fundamental Researches (SFFR) provides the possibility to support high quality ideas and proposals using co-financing mechanisms of different countries, to integrate intellectual and financial resources and to evaluate proposals involving Ukrainian and foreign experts. International cooperation contributes to raise the quality of the procedure and to select priority projects. It also promotes scientific development to the interests of Ukraine and other countries.

SFFR was the first in Ukraine to start the system of grant support for scientific and scientific and technical projects in fundamental sciences on competitive basis.

SFFR announced about 50 calls: general thematic calls, targeted calls, regional calls, innovation-oriented calls, cross-border calls, grants of the President of Ukraine to support scientific research of young scientists etc. Joint calls were announced together with the corresponding funds of Belarus, France, Germany, Russia, the United States, France and Japan. The proposals submitted within joint calls are evaluated by Ukrainian and foreign experts. The supported joint projects are implemented according to the bilateral governmental agreements.

According to ENPI Country Strategy Paper (2007-2013) for Ukraine, "Support for scientific and technological cooperation will also be important with a view to contributing to sustainable and equitable economic development of Ukraine including through fuller participation in research-related activities such as the 7th Framework Programme, joint research projects, the Marie Curie international mobility scheme for scientists and practical training at the seven institutes of DG Joint Research Centre (DG JRC)."<http://www.enpi-info.eu/library/content/ukraine-country-strategy-paper-2007-2013>)

It is also important to refer to the EU document "Implementation of the European Neighbourhood Policy in Ukraine: Progress in 2013 and recommendations for action",



which reads that Ukraine became the seventh largest international partner in the Seventh Framework Programme (FP7), participating in 270 projects with a total EU contribution of nearly EUR 27 million. Future opportunities for cooperation were identified in the context of the upcoming Horizon 2020 programme, notably in the fields of biotechnologies, new materials, information and communications technology and aeronautics. (<http://www.enpi-info.eu/library/content/ukraine-enp-progress-report-2013>)

It is important to mention that “On information society” Ukraine’s new information society strategy was adopted in May 2013 covering issues such as access to public information, protection of intellectual property, e-governance, open government, electronic circulation of documents and information security. The National Commission for Communications Regulation and Informatisation (NCCIR) decision defining state supervision of the telecoms market came into force in February. The NCCIR was granted additional powers to provide state market inspection, as well as to impose sanctions on market operators breaking the law on state market monitoring. In March, the first plenary meeting of the EaP Electronic Communications Regulators’ Network was held in Kyiv, hosted by the NCCIR. During the second plenary meeting of this Network in September, 2013 an NCCIR member was elected Network Chair for 2014. Since March an e-government system, including electronic circulation of documents, has been used by the Parliamentary Secretariat, the Cabinet of Ministers, all ministries and other governmental agencies. (see above).

#### Policy Measures facilitating co-operation between EU and Ukraine

N°	Title	Organisation responsible
1	Agreement on cooperation in S&T between the EC and Ukraine (into force from 11/02/2003 and renewed on 8/11/2004)	Government
2	Partnership and Cooperation Agreement Between the EU and Ukraine, 1994	Government
3	EBRD Strategy for Ukraine (2011-2014)	EBRD/Government
4	The National Programme of Informatization	Government
5	The Concept of e-Government in Ukraine until 2015	Government
6	The Strategy for Development of Information Society and Informatization	Government
7	European Union – Ukraine Cooperation in Science, Technology and Innovation: Roadmap of Cooperation 2011-2-13	Government/EU
8	Higher Education in Ukraine: Tempus Report 2010	EU/Government
9	ENP Country Progress Report 2011: Ukraine	EU/Government
10	ENP Country Progress Report 2012: Ukraine	EU/Government
11	ENP Country Progress Report 2013: Ukraine	EU/Government
12	Ukraine: National Indicative Programme 2011-2013	EU/Government

**Table 2: Overview of bilateral EC-Ukraine agreements**

Title of document	Date	Country/Organisation	Scope of cooperation agreed
Agreement of Renewing of the Agreement between Ukraine	2011	EU - Ukraine	Agreement

Title of document	Date	Country/Organisation	Scope of cooperation agreed
and the European Community of Science and Technology Cooperation			
Partnership and Cooperation Agreement between the European Communities and their Member States and Ukraine	1994	EU - Ukraine	Partnership and Cooperation Agreement
Protocol to the Agreement on Partnership and Cooperation between Ukraine and the European Communities and their Member States on the Framework Agreement between Ukraine and the European Community on General Principles of Ukraine's Participation in the Community's Programmes	2010	EU - Ukraine	Protocol to the Agreement on Partnership and Cooperation
EU-Ukraine Association Agenda to prepare and facilitate the implementation of the Association Agreement	2013	EU - Ukraine	Association Agenda
Agreement for Cooperation between the European Atomic Energy Community and the Cabinet of Ministers of Ukraine in the Field of Controlled Nuclear Fusion	2002	EU – Ukraine/ The European Atomic Energy Community - Cabinet of Ministers of Ukraine	Agreement for Cooperation in the Field of Controlled Nuclear Fusion