

Country Report: Ukraine

Date: 2009-07-08

1. General country information Country name	Ukraine
Population	The population of Ukraine is 46,2 mln people. It is one of the most densely populated countries in Europe, and the average population density is 85 persons per 1 sq. km. Ukraine is the fifth in Europe (after Germany, Italy, Great Britain, and France) and 21st in the world in the terms of population. The urban population makes 68%, rural - 32%. Average life expectancy for men is appr. 61 years, for women - 73 years. Ukrainians make 73% of the total population. 14 mln. (27 %) of Ukrainian citizens are representatives of other nationalities: Russians, Belarussians, Moldavians, Bulgarians, Poles, Hungarians, Romanians, Greeks, Tatars, Armenians, Gypsies, Crimean Tatars, Germans and others.
Area	Ukraine is situated in the central part of the Eastern Europe. It borders Belarus, Hungary, Romania, Moldova, Poland and Slovakia. Ukraine has the longest border with Russia. It stretches 893 km from the north to the south, and 1316 km from the west to the east. The country's territory is 603.7 sq. km.
Capital	Kyiv is the largest city and the capital of Ukraine. It is the most significant political, economic, scientific and cultural centre of the country. It is also the centre of Kyiv oblast. The population of Kyiv is about 3 mln. people.
System of Government	Ukraine has presidential and parliamentary system of government. The basic principles of the state order in Ukraine are defined by the Constitution of Ukraine - the Fundamental Law, according to which "Ukraine shall be a sovereign and independent, democratic, social, law-based state." According to Article 5 of the Constitution, "Ukraine shall be a republic." President of Ukraine - Victor Yushchenko. The status of the President of Ukraine is defined in Title V of the Constitution of Ukraine which stipulates the rights and responsibilities of the President as the Head of State.
Head of the Government	Prime Minister - Yulia Tymoshenko. She was appointed by the Verkhovna Rada of Ukraine upon the submission of proposal by the President of Ukraine on 18 December 2007.
Minister of Education and Science	Ivan Vakarchuk
Parliament	The sole body of legislative power in Ukraine is the parliament – the Verkhovna Rada of Ukraine. The constitutional membership of the Verkhovna Rada of Ukraine shall comprise 450 people's deputies of Ukraine

	elected on the basis of universal, equal and direct suffrage by secret ballot.
Administrative structure	The President of Ukraine is the Head of State. The highest executive authority in Ukraine is the Cabinet of Ministers. It is formed and acts according to the provisions of the Constitution of Ukraine and the Law of Ukraine "On the Cabinet of Ministers". The Cabinet of Ministers is reported to the Verhovna Rada. The Cabinet of Ministers has the Department of Humanitarian Policy which deals with the issues related to science and technology.
Geography	Ukraine is the largest country entirely located in Europe. It represents 5.7% of the total area of Europe and 0.44% of the world's dry land surface. Ukraine stretches 1,316 km from west to east and 893 km from north to south. Ukraine borders with Belarus to the north, Poland to the west, Slovakia, Hungary, Romania and Moldova to the southwest, and Russia to the east and northeast. Its southern territories are washed by the Black Sea and the Azov Sea. Most of the country is flat, with mountains only in its western part, as well as its southern part, the Crimea. These are the Carpathian Mountains and the Crimean Mountains. The highest Ukrainian mountain peak is Hoverla (2,061 m) in the Carpathian Mountains. □ Ukraine's climate is mainly moderately continental. However, there is a subtropical area in the southern part of the Crimea.

2. S&T- related information

2.1. Research structure

2.1.1. Characterisation of the research system

Science in Ukraine is concentrated in 1,404 scientific institutions, representing the following four sectors of science:

- academic – 365 (26%)
- field – 789 (56%)
- university – 178 (13%)
- industry - 72 (5%).

Academic science is presented by the National Academy of Science of Ukraine and five field academies of sciences – Ukrainian Academy of Agrarian Sciences, Academy of Medical Sciences, Academy of Pedagogical Sciences, Academy of Legal Sciences and Academy of Arts. Research is also carried out by field institutes, institutions of higher education, industrial research institutes, engineering departments and special engineering bureaus.

2.1.2. Indicators

Key criteria of science, technology and innovation indicators:

- reflection of the situation in science, technology and innovation in the region
- provide comparability with international standards
- management effectiveness in different sectors on different levels

Key tasks of science, technology and innovation indicators:

- specification of the current science, technology and innovation experience, resources, activities, and related policy making infrastructure
- identification of national, EU and EECA partners based on current objectives and facilities
- categorization of the national facilities on their potential for science, technology and innovation cooperation in the current EU-EECA projects and tasks

NIP Ukraine analyzed 21 indicators of the EU (five groups):

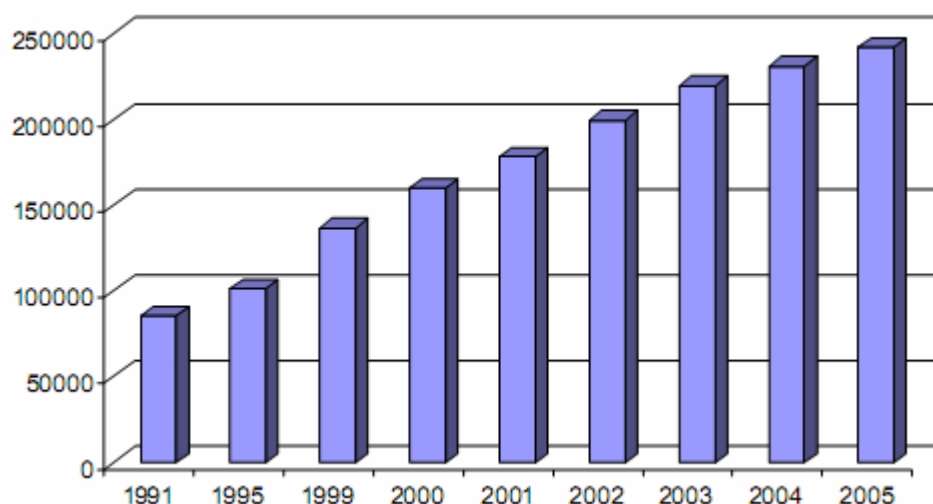
- **general indicators** (capital deepening, gross domestic product, labour productivity, manufacturing industry technology categories, purchasing power standards, SMEs, total factor productivity, value added)
- **human resources indicators** (researchers, S&E graduates)
- **RTD expenditure indicators** (government budget for RTD, gross domestic expenditure on RTD, tax subsidies, venture capital investment)
- **S&T competitiveness indicators** (high-tech knowledge intensive services, high-tech trade, technology balance of payments receipts)
- **Scientific and technological performance indicators** (scientific specialisation, technological specialisation, triadic patents)

The following most common indicators are used in scientific literature to assess the tendencies in the field of science and technology in Ukraine:

- salary of scientists
- number/budget of research programmes/projects
- number of scientific publications
- scientific citing
- budget to fund fundamental research
- quantitative characteristics of the scientific community
- etc

The dynamics (in number) of scientific publications is shown on Fig.1.

Scientific publications of Ukrainian scientists in the period of 1991-2005



Ukraine's scientific and technical potential data is annually published by the State Committee of Statistics of Ukraine. The data analysis enables both to obtain information on the current status of science and evaluate the effect of science on certain tendencies of the country's social and economic development.

2.1.3. Research performers

The geography of location of the Ukrainian research institutions is not well balanced. Most of them are located in the economically developed regions of Ukraine. About two thirds of all institutions are in Kyiv (24.2%), Kharkiv (15.5%), Dnipropetrovsk (6.6%), Lviv (6.0%), Donetsk (5.3%) and Odessa (4.6 %) oblasts.

According to the State Committee of Statistics of Ukraine, the number of the research institutions personnel decreased by 1.2 in the period from 2000 to 2007, and it estimated 155.5 thousand persons in 2007.

The number of scientific and scientific and technical researchers per 10 thousand persons of economically active population is 30 persons.

However the personnel potential of Ukrainian science remains rather big in number, its structural characters are not satisfactory. The data in Table 1 below shows that the most number of Ukrainian researchers (more than 45%) work in the field of engineering which reflects the traditional direction of Ukrainian science of 1980s.

Table 1

	Part of general amount of researchers in 2006 (%)	Including		Part of general amount of researchers in 2007 (%)	Including	
		doctors of science (%)	candidates of science (%)		doctors of science (%)	candidates of science (%)
1. Engineering	47.8	2.1	10.6	46.2	2.1	10.5
2. Physics and mathematics	9.7	12.8	33.3	9.7	13.4	33.9
3. Multidisciplinary sciences	8.5	3.1	24.8	9.2	3.5	25.3
4. Agriculture	8.1	4.1	25.3	8.0	4.3	25.6
5. Medical sciences	5.8	14.7	38.2	6.0	15.2	38.0
6. Biology	5.1	8.1	34.0	5.4	8.2	33.9

7.	Chemistry	3.2	7.2	35.4	3.3	7.1	35.3
8.	Economic sciences	2.9	8.0	27.0	3.0	8.5	29.1
9.	Geology	2.7	8.5	27.4	2.7	8.9	27.8

At the same time, as regards the age structure of the personnel segment, 46% of with scientific degrees in engineering sciences are over 60. It is obvious that such scientific and technical personal structure negatively influences the prospects of application of the results in engineering researches for economic development in Ukraine. More than 50% of experts with scientific degrees in economical sciences are also over 60.

2.1.4. Research funding system

In accordance with the law, science and technology expenditure is a secured line in the State Budget of Ukraine. Scientific studies are funded from the budget pursuant to the basic and programme-oriented procedures. Basic funding is made available to carry out:

- fundamental scientific research ;
- research in the most essential for the state directions, including national security and defence RTD;
- development of S&T infrastructure;
- preservation of scientific objects of national property;
- research personnel training.

There are the following sources of funding in Ukraine:

- budgetary funding
- Ukrainian public science foundations
- foreign science foundations
- contracts with public enterprises
- contracts with private enterprises
- leasing premises
- other sources

The academic and university sectors are funded from the state budget mainly, whereas RTD organizations that associated with industry are funded subject to the agreements with customers. Also in the case of industry sector foreign investments play primary role

2.2. Research policy

2.2.1. Context of research policy

The Ministry of Education and Science of Ukraine (MESU) is the central executive authority in Ukraine, governed and coordinated by the Cabinet of Ministers of Ukraine, which implements government policy in the fields of education, S&T research and development, identifies the main directions for future development in the fields of S&T and education, ensures national science and education integration into the global system. MESU launches national S&T programmes on the basis of the targeted projects and programmes that are selected on the competitive basis.

Other ministries and state committees of Ukraine incorporate in their infrastructure a department in charge of science, technology and innovation, in particular the Ministry of Industrial Policy, Ministry of Agrarian Policy, Ministry of Health, Ministry of Economics, Ministry of Environment, Ministry of Fuel and Energy, Ministry of Transport and Communication and others.

The Department of International S&T Cooperation and European Integration of MESU concludes and ensures implementation of international agreements in science and education, promotes cooperation with foreign institutions.

The Parliament of Ukraine refers to law that the budget expenditure should include 1.7% for RTD. The actual part of RTD expenditure within the GDP of Ukraine is around 1.4%. The total amount of budget funds for the public RTD target programmes does not exceed the total budget financing for RTD for the last three years estimating from 4.5 to 5%. At that, almost 1/3 of the budget is allocated to the National Academy of Sciences of Ukraine. The Ministry of Education and Sciences of Ukraine is receiving up to 10%, the Ministry of Industrial Policy of Ukraine – from 9 to 10%, the Academy of Medical Sciences - 8%, the Ministry of Fuel and Power – up to 8%, the Ministry of Transport and Communication - up to 5%. The remaining amount is distributed between other ministries and departments.

Financing of international S&T cooperation makes 4% of total amount of the budget expenditure for RTD in Ukraine. The programmes and projects in the field of international S&T cooperation are the base for scientific researches aimed to integration of domestic science in ERA in view of national interests. Financing of S&T programmes and projects within international S&T cooperation is carried out annually at a rate of 83-88% from budget programme "Implementation of commitments of Ukraine in the field of international S&T cooperation". Financing of researches in the field of international S&T cooperation is distributed as follows:

- implementation of S&T cooperation programmes: 11.7% (of total financing for this purpose)
- implementation of the bilateral international programmes: 36.0%
- financing of programmes and projects within cooperation with NIS countries: 48.5%

2.2.2. Research policy: objectives and priorities

Objectives and priorities of S&T development have been implemented through the system of state scientific and technical venture programmes and state order for S&T products. Current priority areas of science and technology development are:

- Fundamental research into most important problems of natural sciences and humanities;
- Problems of demographic policy, human development and civil society formation;
- Environmental conservation and sustainable development;
- New biotechnologies and methods of treatment of the most common diseases;
- New computerized tools and technologies for informatization of society;
- New technologies and resource saving technologies in power engineering, industry and agriculture;
- New substances and materials.

2.2.3. Policy making and coordination

Scientific activities in Ukraine are organized according to the Constitution of Ukraine, the Law on Science and the Law on the State Budget. The RTD tasks are distributed between:

- basic research (17.8%)
- applied research (14.4%)
- design and development (64.7%)
- S&T assistance (16.6%)

The Ministry of Education and Science of Ukraine is the principle authority in the system of central executive authorities to ensure implementation of the state policy in the fields of education, science, technology, innovation and intellectual property.

2.2.4. National research programmes

Funding of venture scientific programmes is set according to the budget law adopted by the Parliament and priorities of S&T (usually 30% of budget for the state financing of science). Sources of financing science include:

- funds of the state and local budgets (33.7%);
- non-budget funds (0.5%);
- private funds of researchers (6.5%);
- funds of organizations-customers of Ukraine (32.6%);
- funds of foreign customers (24.4%);
- funds from other sources (2.3%).

2.3. International co-operation in research, science and technology

2.3.1. Scope and objectives

According to the Law of Ukraine "On Ratification of the Agreement between Ukraine and the European Commission" which was ratified on 01 July 2004, the legal base for S&T cooperation between Ukraine and the EU has been updated. To implement this Agreement, the Law of Ukraine "On Amendment to Article 5 of the Law of Ukraine "On VAT" was adopted on 01 July 2004 as well as the joint Order of the Ministry of Education and Science of Ukraine and the Customs Service of Ukraine. "The Regulations on Import of Goods (Equipment) to the Territory of Ukraine in Conformity with the Agreement on Ukraine-EU S&T cooperation" which permits the tax-exempt of facilities imported within international projects, is prepared. It provides for favorable conditions for international S&T cooperation.

2.3.2. Co-operation with EECA-countries

Ukraine has concluded agreements on S&T cooperation with the following EECA countries: Azerbaijan, Armenia, Belarus, Georgia, Moldova, Russia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan.

2.3.3. Co-operation with EU-member states and associated countries

The policy drive for the EU-Ukraine S&T co-operation includes the following:

- European Neighbourhood Policy
- EU-Ukraine Action Plan
- Agreement on Co-operation in Science and Technology between the European Community and Ukraine

Ukraine is involved in a wide range of S&T cooperation on the basis of bilateral agreements. A key priority is given to S&T cooperation based on the Agreement on co-operation in Science and Technology between the European Community and Ukraine signed on 04 July 2002, which gave base for further enlargement and enhancement of collaboration between scientists, and bilateral agreements with the EU countries.

The EU-Ukraine Action Plan includes the part related to science and technology. The thematic working groups, in accordance with the FP7 priorities, were set up in Ukraine by the Ministry of Education and Science of Ukraine.

MESU maintains the activities of the National Information Centre for Ukraine-EU S&T Cooperation (NIP Ukraine) which is created, mainly, to coordinate on the national level

activities related to participation in the EU Framework Programmes. NIP Ukraine was granted the authorities of the National Contact Point by MESU in 2008. MESU coordinates S&T cooperation of Ukraine with more than 50 countries, including the EU member-states and associated states. The intergovernmental S&T cooperation agreements were signed with 19 EU countries: Austria, Bulgaria, Croatia, Germany, Estonia, Finland, France, Greece, Hungary, Italy, Latvia, Lithuania, Macedonia, Poland, Portugal, Romania, Slovakia, Slovenia, Spain.

International S&T cooperation/ projects (in figures)

Programme	Number of supported projects	Financing, euro	Notes
INTAS	849	≈ 20, 500, 000	10 % of total budget
FP6	93	5, 682, 760	13.99 % success rate
FP7 (as for March 2009)	56	192, 521, 349	16.91 % success rate
STCU (2004-06)	275	≈ 27, 000, 000	
EUREKA	22	≈ 8, 000, 000	

Source: NIP
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