

## Innovation system

### Current state of the innovation system

Innovation system in the Republic of Serbia is mainly organized as a consequence of activities and measures of the Ministry in charge of science, technological development and innovation activities. In order to make this system effective, it would be necessary to include all other ministries, governmental agencies and local governments into its realization. We hope that this will be gradually implemented during the foreseen accession of Serbia to EU. An overview of the current state of the innovation system is given in the sequel according to WBinNO project<sup>1</sup>.

The following data present innovation activities in Serbian companies, covering the three year period from 2008 to 2010. The survey was conducted on a sample of 3982 companies. Innovative companies are defined as the ones that introduce product or process innovation, innovation in organization or marketing innovation during the observed period. The research reveals that the share of companies with at least one of the innovation types mentioned above is around 47%. Almost 70% of large companies, more than half of medium companies and more than a third of small companies are innovative. Innovative activities are more common in manufacturing companies (innovations were introduced in more than half of them), while only 40% of service companies introduced any innovations.

**Table 2.1.6.1.** Companies in Serbia by innovation activity and size during the period 2008-2010<sup>2</sup>

	Total	Companies with innovations	Companies without innovations	% companies with innovations
Total	12141	5812	6329	47,9
Small companies	9347	4143	5204	44,3
Medium companies	2237	1280	957	57,2
Large companies	557	389	167	69,8
Manufacturing companies	4141	2314	1827	55,9
Service companies	8000	3498	4502	43,7

The share of companies with product and process innovation is almost the same. The share of companies with marketing and organization innovations is a bit more significant. Companies with all types of innovation are mostly in the manufacturing sector.

<sup>1</sup>Djuro Kutlaca, Marija Mosurovic-Ruzicic, Dusica Semencenko (2012): Serbia's national innovation system and its performance, project INNOVATION POLICY LEARNIG FROM NORWAY IN WESTERN BALKANS (WBinNO), funded by NIFU STEP, 2011-2013, working document.

<sup>2</sup>National Bank of Serbia, Statistical Office of Republic of Serbia

The share of innovative enterprises generally increases with the size of the enterprises, similarly to EU countries. However, there are generally far fewer medium-sized and large enterprises than small enterprises.

There are 47.9% of companies with innovation among the Serbian enterprises, and it is just a little bit below the EU-27 average (according to the Report for Sixth Innovation Survey, in the EU27, 52% of enterprises from industry and services reported innovation activity between 2006 and 2008).

**Table 2.1.6.2.** Companies by type of innovation and sectors<sup>3</sup>

	Innovative companies								
	Sum		Product innovation, Process innovation		Organizational innovation and Marketing innovation		Product innovation Process innovation Organizational innovation and Marketing innovation		Company without innovation
	Number	%	Number	%	Number	%	Number	%	%
Sum	5812	47.9	4495	37.0	4881	40.2	3564	29.4	52.1
Agriculture, forestry and fishing	221	43.2	177	34.6	159	31.1	114	22.3	56.8
Mining and quarrying	24	40.7	23	39.0	20	33.9	19	32.2	59.3
Manufacturing	2156	57.6	1769	47.3	1851	49.5	1464	39.1	42.4
Electricity, gas, steam and air conditioning supply	32	42.7	25	33.3	32	42.7	25	33.3	57.3
Water supply; sewerage, waste management and remediation activities	102	38.6	75	28.4	85	32.2	58	22.0	61.4
Construction	458	37.7	326	37.7	367	30.2	235	19.3	62.3
Wholesale and retail trade; repair of motor vehicles and motorcycles	1442	43.7	980	43.7	1237	37.5	776	23.5	56.3
Transportation and storage	264	37.9	228	37.9	183	26.3	147	21.1	62.1
Accommodation and food service activities	149	37.5	114	37.5	121	30.5	86	21.7	62.5
Information and communication	277	56.5	223	56.5	262	53.5	207	42.2	43.5
Financial and insurance activities	81	66.9	69	66.9	76	62.8	64	52.9	33.1
Real estate activities	13	36.1	13	36.1	6	16.7	6	16.7	63.9
Professional, scientific and technical activities	476	51.0	390	51.0	379	40.6	293	31.4	49.0
Public administration and defense; compulsory social security	117	39.0	85	39.0	102	34.0	70	23.3	61.0

<sup>3</sup> National Bank of Serbia, Statistical Office of Republic of Serbia

## Structure of the innovation system

Innovation system includes a variety of stakeholders – government, financial market, education market, workforce market as well as research and technological organizations – establishing a context in which there is a possibility for companies to innovate. International experience shows that financial aid, either governmental or private, is by no means enough, but that all other elements of the innovation system must be put in motion in order to obtain measurable results. It is essential to stimulate entrepreneurial initiative, attract the critical mass of venture capital (VC) for enabling business start-up, as well as maintain a strong industrial base, while, at the same time, provide funding for education, ICT deployment and sustainable resource exploitation.

Key instruments of innovation policy are:

- Financial support for realization of innovations and for innovative companies;
- Technology centers which provide for technology transfer and give surveying services for companies;
- Support for companies in joint venturing;
- Support for universities and research centers in R&D commercialization;
- Development and engagement of innovation specialists for SMEs.

According to World Economic Forum's Global Competitiveness Index 2012/13 Serbia is ranked at the meagre 144<sup>th</sup> place. Serbia's position in key international benchmark indicators shows evidence of a low level of innovation activities and relatively weak international competitiveness. Compared to the EU27 average, the total expenditures for research and development (R&D) in relation to the GDP are very low but comparable to those in the EU10, mainly due to the **comparatively low R&D spending of the Serbian business sector**. Regarding the outcomes of R&D activities, Serbia performs significantly weaker than the EU countries on average as evidenced by the number of patents by public R&D organizations and corporate sector. The reasons for this substantial gap between the EU average and Serbia is the **lower efficiency of the Serbian R&D system** due to **limited institutional capacity, lack of commercialization expertise, a low level of public-private collaboration in R&D and lack of incentives** to do so. (Sources: Eurostat, European Patent Office, World Intellectual Property Organization, Web of Science, Statistical Office of the Republic of Serbia and Erawatch).

**Table 2.1.6.3.** Serbian innovative activities<sup>4</sup>

<b>Rank</b>	<b>2010/11 Rank/139</b>	<b>2011/12 Rank/142</b>	<b>2012/13 Rank/144</b>
Capacity for innovation	82	110	120
Quality of scientific research institutions	56	61	67
Company spending on R&D	108	130	132
University-industry collaboration in R&D	71	81	99
Availability of scientists and engineers	92	83	78
Utility patents per million population	78	67	119
Availability of latest technologies	117	123	127
Firm-level technology absorption	134	136	142

### **Intellectual property**

Protection of results of scientific research is one of the foremost prerequisites for successful commercialization of inventions. The process which starts with the creation of an invention and finishes with its commercialization, be it through a spin-out process or via licensing the technology, is known as technology transfer. Intellectual property office is one of the most important stakeholders in this process. Its role is to help researchers in a) Patenting, b) Education, c) Commercialization preparation, d) Information delivery, e) Commercialization, and f) Institutional strengthening. Information and Education Center of the Intellectual Property Office is pivotal for raising the general awareness about intellectual property and its significance for social and economic development.

The center concentrates on establishing the programs in the area of intellectual property in order to serve the main stakeholders, namely companies (including SMEs), research institutes, courts, police, market inspection, customs, media, legal entities and general public. Special importance can be given to Intellectual property diagnosis, a service aimed to help companies to identify the forms of intellectual property they have, as well as to adopt adequate strategies for intellectual property management.

A program for collaboration with technical faculties has been started in order to create centers for supporting technology transfer between R&D institutions and companies. This program is to be extended to all other faculties where this is possible.

The University of Belgrade has, in the framework of „Support for Education & and Information Centre of the Intellectual Property Office of the Republic of Serbia”, founded the Technology

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<sup>4</sup> World Economic Forum's Global Competitiveness Index

Transfer Centre (TTC). Its activities comprise identification, protection and commercialization of R&D results of the University of Belgrade.

Patent activity of our research institutions is quite modest. It is expected that a series of stimulus measures and actions lead to significant improvements in this area. So far, most patented are in the following three areas: electronics, telecommunications and information technology.

**Table 2.1.6.4.** Patent activity of research institutions

	2008	2009	2010	2011	2012
Patent applications, domestic applicants	386	299	290	180	191
Small Patent applications, domestic applicants	136	101	97	67	75
Registered patents, domestic holders	70	103	98	60	79
Registered small patents, domestic holders	81	86	74	48	61

### Current initiatives and projects in the innovation system

At this moment, the following projects and initiatives are still active:

- ICIP – Improved SME Competitiveness and Innovation Project ([www.icip-serbia.org](http://www.icip-serbia.org))
- SECEP – Support to Enterprise Competitiveness and Export Promotion ([www.secep.rs](http://www.secep.rs))
- LEDIB (Local Economic Development in the Balkans) Programme ([www.ledib.org](http://www.ledib.org))
- Cluster Development Support Programme, implemented by the Ministry of Economy and Regional Development (<http://klasteri.merr.gov.rs/en/>)
- Enterprise Europe Network in Serbia (<http://www.een-srbija.rs/>)
- CIP and EIP projects in Serbia (<http://www.cip-srbija.rs/>)
- IISP- Integrated Innovation support Programme (<http://www.iisp.rs/>)
- EDIF (Enterprise Development and Innovation Facility) reform prioritization Serbia provides a short list of some 20-25 reform suggestions for each beneficiary economy in the Western Balkans.
- Regional R&D for Innovation Strategy WBC
- Project Export promotion of innovations products ([www.bitf.rs](http://www.bitf.rs))
- KNOWTS National Platform for Knowledge Triangle, Tempus project (<http://knowts.elfak.ni.ac.rs/>)
- Modernization of WBC universities through strengthening of structures and services for knowledge transfer, research and innovation, Tempus project ([www.wbc-inno.kg.ac.rs](http://www.wbc-inno.kg.ac.rs))
- CAPINFOOD - Improving the enabling environment and public awareness for innovation in the South-East-European food sector through transnational collaboration (<http://www.capinfood.eu/>)

**Development of consulting services:** business and technology incubators (Business Incubator Novi Sad, Business Incubator Zrenjanin, Business and Technology Incubator of the technical faculties in Belgrade), Technology Transfer Centers (such as the one at the University of

Belgrade), Intellectual property protection centers (such as the one at the University of Novi Sad), EEN – Enterprise Europe Network.

**Current mechanisms for promoting innovations:** Best Technology Innovation Competition ([www.inovacija.org](http://www.inovacija.org)), Tesla fest, education and trainings at workshops delivered through different international and national projects.

**Knowledge transfer partnerships:** clusters (Vojvodina ICT cluster, Niš ICT cluster, Creative Industry Cluster of Vojvodina, Vojvodina Metal Cluster...), Center for Competences and Clusters at FTN Novi Sad, UNESCO Chair for Entrepreneurial Studies at the University in Novi Sad, Centre for Financial Sector Development at FTN Novi Sad.

**International partnership in knowledge transfer:** IPA (COMPLEXIM, ECORYS, COMP-COMP, MORDIC etc.) and TEMPUS programs (S&T Park, KNOWTS, WBC Inno).

**Science & Technology Parks:** soon to be established - Science & Technology park of the University in Novi Sad – part at the Faculty of Technical Sciences and Science & Technology park Zvezdara in Belgrade.

**Innovative organizations (Development and Production Centers (72), R&D Canters (25), Innovation Centers (5), Business and Technology Incubators (4) and Science & Technology Parks(2))** are registered according to the Law on Innovation Activity at the Ministry of Science, Technological Development and Innovation Activities. Currently, there are 108 organizations in this register.

**Entrepreneurial education** at University of Novi Sad is studied at different faculties such as Faculty of Economics, Faculty of Technical Sciences, Agriculture faculty and Faculty of Sciences. During 2006 at University of Novi Sad has been founded UNESCO Chair for Entrepreneurial Studies. Its main goal is promotion of entrepreneurship, not just inside but also, outside the University. Since 2009 master academic study program „Entrepreneurship“ is realized. Except study program, at the University are implementing many projects, which include education and trainings for students and academics, in order to support their entrepreneurial ventures. Since some of the UNS priorities are innovations and entrepreneurship, it participates in large number of initiatives for creation and support of entrepreneurial universities. As forms of support to entrepreneurship development, the University has participated in the establishment of the ICT Cluster, the Cluster of Creative Industries of Vojvodina and the Science and Technology Park. The aim of these activities is to educate and motivate students in their area, to start their own business or how to help in the realization business that already has started.

### **Financial mechanisms**

The government accepts programmes for innovation activities for each fiscal year. They are realized through Public calls for financing the innovation projects of the registered innovative organizations. There are two types of projects contracted with them: 1. Product, process or service innovation and 2. Infrastructural projects (knowledge infrastructure and human capacity building, and procurement of equipment for the organization of infrastructural support

for innovation activities). An overview of the calls so far realized is given in the following table.

**Table 2.1.6.5.** An overview of innovation projects since adoption of the initial Low on Innovation Activities (December 2005)

	<b>Applications</b>	<b>Requested funds</b>	<b>Innovation projects accepted</b>	<b>Infrastructural projects accepted</b>	<b>Total funding for both types of projects</b>	<b>Time frame</b>
<b>1 PC</b>	108	€3.7m	<b>46</b>	<b>7</b>	<b>€2.1m</b>	July 2007/2008
<b>2 PC</b>	165	€6.9m	<b>80</b>	<b>15</b>	<b>€3.5m</b>	Nov 2008/2009
<b>3 PC</b>	220	€4.1m	<b>54</b>	<b>7</b>	<b>€1.2m</b>	April 2010/2011
<b>4 PC</b>	211	€3.6m	<b>95</b>	<b>4</b>	<b>€1.7 m</b>	June 2012/2013
<b>Total</b>	<b>704</b>	<b>€18.3m</b>	<b>275</b>	<b>33</b>	<b>€8.5m</b>	

### **Innovation Fund**

The Ministry in charge of science, technological development and innovation activities has established the Innovation fund in the frame of implementing the Strategy for scientific and technological development 2010-2015.

- The Ministry aims at increasing non-budgetary funds in financing innovation activities, by exploiting the opportunities to use International financial institutions funds and the capital from private sector.
- The fund supports projects from **Partnership Program** (Investments in SMEs that already have an innovative product with a high share of knowledge and innovation and the potential to establish partnerships and sales in the world market) and **Support Program for venture capital funds** (Investments in newly established companies with high share of innovation in the early stages of the high risk have access to other forms of financing).

The Fund offers two types of projects:

- **Early development programs**, intended for private micro and small companies in the early stages of development, which possess a technological innovation and have a potential for developing intellectual property, as well as a clear market need (11/58 projects funded in the first call, 9/106 in the second).

- **Innovation co-financing programs**, intended for expansion of cooperation between Serbian innovative micro and small companies and their strategic partners, as well as Investment and VC funds, with the aim to increase the investment of the private sector into R&D and commercialization of new and improved products and services (5/40 projects funded in 2012).

Also, **Ministry of Finance and Economy** supports innovation strengthening through a program within which it has donated about €300,000 for 1. Support for innovations in SMEs and entrepreneurs, 2. Connecting SMEs with R&D institutions, S&T Parks and consulting agencies as well as technology and knowledge transfer, 3. Increase in the number of SMEs and entrepreneurs investing in innovation activities and 4. Increase of the SME and entrepreneurs market share both at Serbian and international markets.