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Abstract

The Analytical Country Reports analyse and assess in a structured manner the evolution of the national policy research and innovation in the perspective of the wider EU strategy and goals, with a particular focus on the performance of the national research and innovation (R&I) system, their broader policy mix and governance. The 2013 edition of the Country Reports highlight national policy and system developments occurring since late 2012 and assess, through dedicated sections:

national progress in addressing Research and Innovation system challenges;

national progress in addressing the 5 ERA priorities;

the progress at Member State level towards achieving the Innovation Union;

the status and relevant features of Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3);

as far relevant, country Specific Research and Innovation (R&I) Recommendations.

Detailed annexes in tabular form provide access to country information in a concise and synthetic manner.

The reports were originally produced in December 2013, focusing on policy developments occurring over the preceding twelve months.

ACKNOWLEDGMENTS AND FURTHER INFORMATION

This analytical country report is one of a series of annual ERAWATCH reports produced for EU Member States and Countries Associated to the Seventh Framework Programme for Research of the European Union (FP7). ERAWATCH is a joint initiative of the European Commission's Directorate General for Research and Innovation and Joint Research Centre.

The Country Report 2013 builds on and updates the 2012 edition. The report identifies the structural challenges of the national research and innovation system and assesses the match between the national priorities and the structural challenges, highlighting the latest developments, their dynamics and impact in the overall national context.

The first draft of this report was produced in December 2013 and was focused on developments taking place in the previous twelve months. In particular, it has benefitted from the comments and suggestions from Alexander Kleibrink (JRC-IPTS). The contributions and comments from DG-RTD are also gratefully acknowledged.

The report is currently only published in electronic format and is available on the ERAWATCH website. Comments on this report are welcome and should be addressed to jrc-ipts-erawatch-helpdesk@ec.europa.eu.

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EXECUTIVE SUMMARY

Serbia is a candidate country for EU membership, and has population of 7,186,862 (census 2011; excluding Kosovo), which comparing to the EU28 population of 504.63 million inhabitants on 1 January 2012, presents 1.4% share of the total. In the year 2012, Serbia's GDP per capita (€4158) reached 16% of the EU28 average. At the same time Serbia's unemployment rate was 23.9%; more than twice higher than the EU28 average of 10.5%. Real growth rate of GDP in 2012 was -1.7. In 2012, Serbia's GERD as a percentage of GDP was 0.96% which was significantly lower in comparison to the EU27 average (2.06%).

The structure of the policy coordination mechanisms remain unchanged last decade: the first level of research governance is the National Parliament, the highest legislative authority in the country, and the Committee for S&T Development reviews and proposes to the Parliament the laws regulating the area of research and innovation. The MESTD governs the functioning and development of S&T in Serbia and is responsible for fulfilment of the country's obligations in this area. The main task of the National Council for S&T Development is to design and propose to the government a strategy for S&T development and to monitor its implementation.

Despite the economic crisis, the overall public R&D expenditure in Serbia has been increasing over the past years. The biggest jump was seen in 2011 when the budgetary allocations increased by 22% in comparison with 2010, following the government obligations which are result of the additional financing for research infrastructure through financial agreements with the EIB and the Council of Europe Development Bank with a total value of €305m to be implemented in 2010-2015. Finally, innovation financing has been supported through an €8.4m IPA project. The Regional and/or National Research and Innovation (R&I) Strategies on Smart Specialisation (RIS3) approach has not been implemented in creation of strategic policy documents in Serbia so far.

The key structural challenges faced by the national innovation system in Serbia are:

1. The absence of coordinated governance and funding of national innovation system (NIS) in Serbia;
2. The government approach to R&I is marked by a linear understanding of the innovation process and is highly fragmented; this is the main obstacle for networking of R&D sector with the rest of economy and society;
3. One of the significant problems in preserving and strengthening the scientific community is the ongoing drain of highly educated individuals from the country;
4. The attractiveness of R&D system in Serbia for private investments in R&D is insufficient because of the present structure and capacities of public R&D system. Restructuring of public R&D system and integration of BES (Business Enterprise Sector) into NIS is primary task for the government;
5. Undeveloped infrastructure for innovative entrepreneurship and lack of culture for technological entrepreneurship in High Education and Government sector;
6. Several more challenges should be mentioned too: (a) Absence of evaluation culture and practice in R&D and innovation system in Serbia; (b) Insufficient knowledge about R&D and innovation capacities in BES; (c) Lack of demand-side R&D and innovation policy tools and measures in Serbia.

The goals of current research policy which should support solutions with all structural challenges, are: (1) the current 55-45% ratio of financing basic as opposed to applied research must progress to 40-60% in favour of applied science in the next five years; (2) Focus by setting seven national R&D priorities in the field of S&T, for the period 2010-2015; (3) Strengthening of the human resource base; (4) Partnership within the R&D system through rationalisation of the R&D network; (5) Partnership with society; (6) Partnership with industry; (7) Partnership with other ministries through the participation of the scientific community in major infrastructural and other projects in Serbia; (8) Increasing and diversifying R&D expenditure: The goal is to reach 1% of GDP for R&I by 2015, not counting infrastructure investments (SSTDRS, 2010). National priorities in the domain of S&T, defined in S&T Strategy are: (1) Biomedicine and human health; (2) New materials and nanosciences; (3) Environmental protection and countering climate change; (4) Agriculture and food; (5) Energy and energy efficiency; (6) ICT; and (7) Improvement of decision making processes and affirmation of national identity.

Major changes in the R&I policy mix are: (a) the “IIR Programme” (“Programme of Co-Funding of Integrated and Interdisciplinary Research for the Research Cycle 2011-2014”) is a new programme for supporting the integration of basic, applied and development research, emphasising commercialisation of R&I results; (b) the “SREF Programme” (“Programme of Providing and Maintaining Scientific Research Equipment and Scientific Research Facilities for the Research Cycle 2011-2014”) is a new programme for improving the material base of R&I; (c) the programmes launched by the Innovation Fund will award selected innovation projects with substantially larger amounts of money per grant.

The creation of the national strategy for science, education, research and innovation is a crucial step for developing a NIS in Serbia. This strategy should address the structural challenges of the present R&I system in Serbia and propose solutions for major problems such as the absence of coordinated governance and funding of NIS in Serbia, networking of R&D sector with the rest of economy and society, and particularly mobilisation of R&I capacities in BES. The development of integral innovation strategy with an appropriate action plan which will stress demand-side as well as supply side R&D and innovation policy tools and measures is a direction for medium term evolvement of the policy mix.

Main findings of the assessment of the national progress towards IU Commitments are:

- There is a relatively established legal and policy environment concerning initiatives at national R&I activities in the country. Nevertheless improvements are needed for more intensive involvement of the business sector in R&I activities;
- There is an established legal framework and programmes launched for creating an infrastructure for knowledge transfer from publicly funded research;
- Missing legal framework for venture capital investments as well as lack of demand-side R&I policy tools and measures in Serbia, together with restructuring of the public R&D system are major challenges with which responsible ministries will be faced in near future.

The main findings of the national progress towards realisation of the ERA are:

- ERA priority 1: There is a multi-annual R&I framework in place (SSTDRS, 2010), providing a long-term policy context to prioritise expenditure on R&I and secure project financing based on open competition for R&D and Innovation projects;
- ERA priority 2: There is established legal and policy environment concerning initiatives at national level related to transnational co-operation in the area of R&I;
- ERA priority 3: Integration of foreign researchers into domestic R&D teams is very welcome and will be awarded in the selection procedure;

- ERA priority 4: There is rather comprehensive legal and policy environment concerning gender equality in Serbia; Overall, the gender structure of employment in R&D sector is balanced, with 49.64% of women researchers in 2012;
- ERA priority 5: There is an established legal and policy environment, as well as physical infrastructure concerning initiatives at national level related to optimal circulation, access to and transfer of scientific knowledge including via digital ERA.

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1 BASIC CHARACTERISATION OF THE RESEARCH AND INNOVATION SYSTEM

Serbia is a candidate country for EU membership, and has a population of 7,186,862 (census 2011; excluding Kosovo; this is a decrease of 311,139 citizens, or 4.15% compared with census in 2002), which compared to the EU28 population of 504.63 million inhabitants on January 1, 2012, presents 1.4% share of the total. In the year 2012, Serbia's GDP per capita (€4158) reached 16% of the EU28 average. At the same time Serbia's unemployment rate was 23.9%; more than twice higher than the EU28 average of 10.5%. Real growth rate of GDP in 2012 was -1.7, in 2011 was 1.6%, in 2010 was 1.0% and in 2009 -3.5%. In 2012, Serbia's GERD as a percentage of GDP was 0.96%¹ which was significantly lower in comparison to the EU27 average (2.06%) but it is a significant increase compared to previous two years: in 2011 GERD was 0.77% and in 2010 GERD was 0.8%, or almost one fifth less than in 2009 (0.92%), as a direct consequence of economic crisis on GDP and overall economic performance in country. The main characteristics of these investments are change and instability i.e. in 2004 Serbia's GERD as a percentage of GDP was 0.32%, in 2006 it increased to 0.72%, in 2007 decreased to 0.64% and in 2008 increased to 0.73%². Comparing to other Eastern European Countries, Serbia significantly lags behind Slovenia (2.8%), Czech Republic (1.88%), Estonia (2.18%), and Hungary (1.22).

The Serbian research system is centralised and governed by the Ministry of Education, Science and Technological Development (MESTD). The MESTD, according to the Law of the Ministries ("Official Gazette of the Republic of Serbia", 72/2012), has been established in 26 July 2012. The MESTD is the dominant and almost only public funding body in the country. Investments in research and innovation in Serbia from public sources are prioritised and budgeted in the framework of multi-annual plans to ensure stability and long term impact. Project financing based on open competition for R&D and innovation projects is decades-long practice in Serbia. Latest developments proved the government's long-term orientation toward competitive rather than institutional funding of R&D activities: the "Strategy of Scientific and Technological Development of the Republic of Serbia 2010-2015" (SSTDERS), adopted by the Government of the Republic of Serbia on 25 February 2010, defined seven national priorities in the domain of S&T and proposed institutional funding on a reasonable level, only for minimum share of maintenance costs of a few government owned R&D organisations. The restructuring of the public R&D system together with harmonised efforts toward recognition and integration of the business R&D sector into the national innovation system is a key objective of government strategy for S&T development of the Republic of Serbia until 2015.

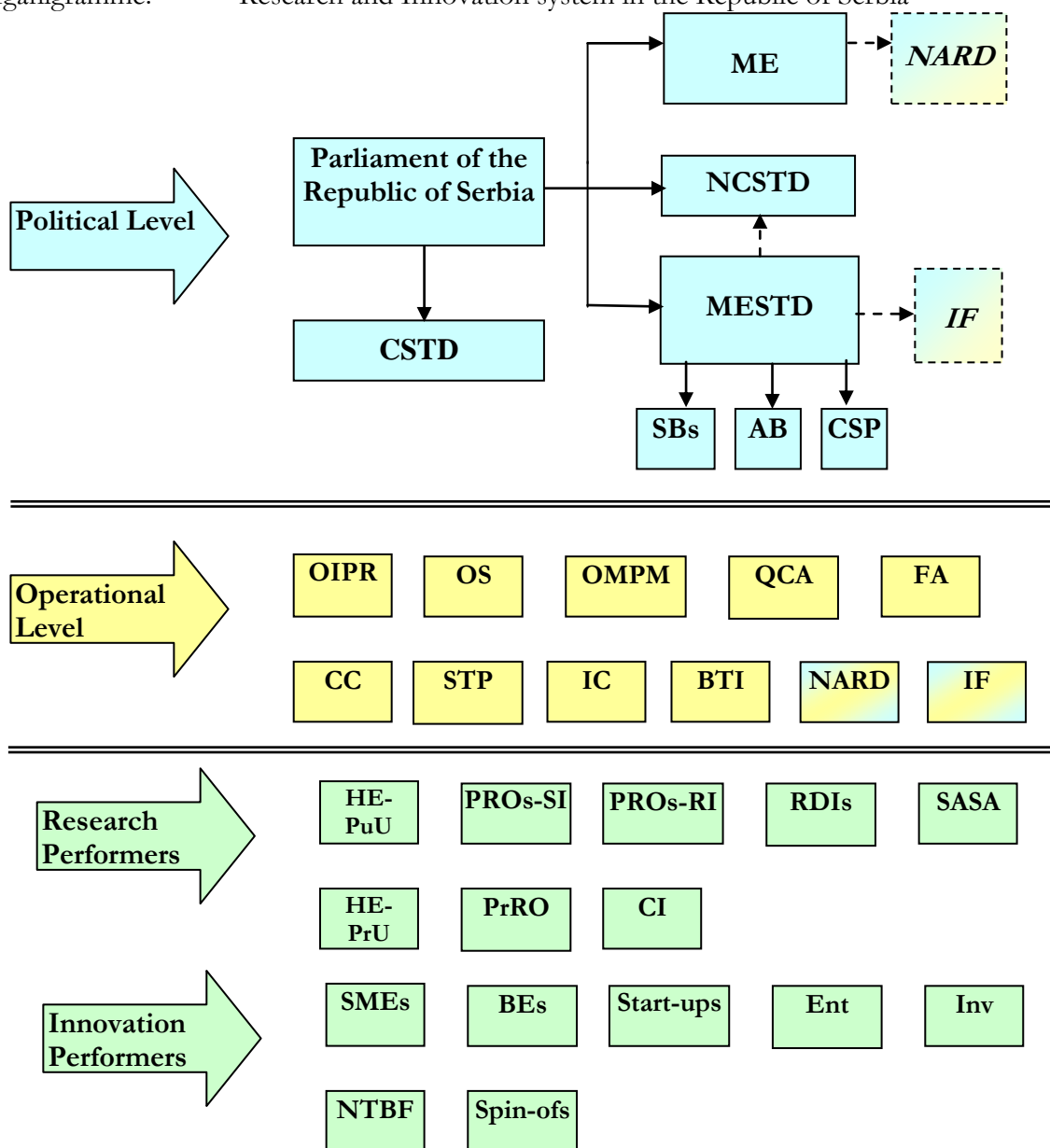
¹ GERD for Serbia is calculated by the author of this report. Calculation is based on data provided by the Statistical Office of the Republic of Serbia within regular yearly statistical reports on S&T activities in Serbia, and using methodology proposed in Frascati Manual defined by the OECD. The quality of available data could be assessed as considerably high having in mind legal framework for collection and recent evaluation of the statistical system in Serbia (recently conducted "Report on Light Peer Review of the Implementation of the European Statistics Code of Practice in Serbia". The light peer review (LPR) of the Statistical Office of the Republic of Serbia was undertaken in the framework of the EUROSTAT funded project 'Global assessments of statistical systems of candidate and potential candidate countries as well as ENP countries'. The review was conducted in 2011-2012: (<http://webzrzs.stat.gov.rs/WebSite/Public/PageView.aspx?pKey=458>).

² R&D Indicators for Serbia are calculated by the author of this report. Calculations are based on data provided by the Statistical Office of the Republic of Serbia within regular yearly statistical reports on S&T activities in Serbia, and using methodology proposed in Frascati Manual defined by the OECD.

Current research policy in Serbia is based on the above mentioned S&T Strategy. National priorities in the domain of S&T, defined in S&T Strategy are: 1) Biomedicine and human health; 2) New materials and nanosciences; 3) Environmental protection and countering climate change; 4) Agriculture and food; 5) Energy and energy efficiency; 6) Information and communication technologies; and 7) Improvement of decision making processes and affirmation of national identity. Together with adoption of this strategy, a multi-annual plan for public financing of R&D activities was adopted too. Realisation of such plans is based on the MES annual budget which must be approved every year by the parliament. Following the SSTDRS, a public call for funding of three programmes (Basic Research, Technological Development and Integrated and Interdisciplinary Research) was announced on 23 May, 2010, supported by the “Act on the selection, evaluation and financing of research for the project cycle 2011 – 2014”, and the “Program for the research cycle 2011-2014” (MSTD Act, 2010). Public funding of such investments in R&D and Innovation activities in the period 2011-2014 will be realized under the S&T strategy assumption that: “A realistic plan of growth of budget appropriations for science is an annual growth rate of 0.15% GDP. At such a pace, the budget appropriations by 2015, the closing of this Strategy framework shall reach 1.05%”.

The Serbian research system consists of three operational levels: 1) the parliament and the national government level, represented by the committee for S&T development; 2) the ministry level responsible for the design and implementation of science and research programmes at national level; and 3) performers of R&D activities and intermediary organisations. The first, political level of research governance in Serbia is the National Parliament, the highest legislative authority in the country. The Parliamentary Committee for S&T Development reviews and proposes to the parliament the laws regulating the area of science, technology and innovation. Two parallel bodies concerning R&D have been established at the level of the Serbian government. The Ministry of Education, Science and Technology Development (MESTD) governs the functioning and development of S&T in Serbia and is responsible for fulfilment of the country's obligations in this area. On the other hand, the main task of the National Council for S&T Development is to design and propose to the government a strategy for S&T development and to monitor its implementation. The operational level consists of intermediary and funding organisations. Research performers are private and public research organisations in government, higher education and the business enterprise sector.

Organigramme: Research and Innovation system in the Republic of Serbia



Legend:

Political Level:

CSTD – Committee for S&T development
MESTD – Ministry of Education, Science and Technological Development
NCSTD – National Council for S&T Development
AB – Accreditation Board
SB – S&T Boards
CSP – Committee for Scientific Promotion
ME – Ministry of Economy
IF – Innovation Fund
NARD – National Agency for the Regional Development

Operational Level:

OIPR – Office for Intellectual Property Rights
OS – Office for Standardization
OMPM – Office for Measurements and Precious Metals
QCA – Quality Certification Agencies
CC – Chambers of Commerce
IC – Innovation Centres
BTI – Business&Technology Incubators
STP – S&T Parks
ITA – IT and Internet Agency
FA – Foreign Agencies for support of Technological Development
NARD – National Agency for Regional Development
IF – Innovation Fund

Research Performers:

HE-PuU – Higher Education, Public Universities
PROs-SI – Public Research Organisations – Scientific Institutes
PROs-RI – Public Research Organisations – Research Institutes
RDI – R&D Infrastructures
SASA – Serbian Academy of Sciences&Arts
HE-PrU – Higher Education, Private Universities
PrRO – Private Research Organisations
CI – Corporate Institutes

Innovation Performers:

SMEs – Small and Medium Sized Companies
BEs – Big Enterprises
Ent – Entrepreneurs
Inv – Inventors
NTBF – New Technology Based Firms

2 RECENT DEVELOPMENTS OF THE RESEARCH AND INNOVATION POLICY AND SYSTEM

2.1 National economic and political context

The process of Serbia's accession to EU has a major impact on the research and innovation system in Serbia. Therefore, the national economic and political context is highly correlated with conditions and outcomes of this process. The Progress Report on Serbia is part of the 2012 Enlargement package adopted by the European Commission on 10 October. The Commission concluded that Serbia continues on its way to sufficiently fulfilling the political criteria and the conditions of the Stabilisation and Association process. The momentum of reforms needs to be reinvigorated and visible and sustainable improvement in relations between Serbia and Kosovo is needed which should gradually result in the full normalisation of relations between Serbia and Kosovo³. In line with its recommendation in the Opinion, the Commission stands ready to confirm that accession negotiations should be opened with Serbia, provided that progress on this key priority is made. In June 2013, the European Council decided to open accession negotiations with Serbia and to hold the first intergovernmental conference in January 2014 at the very latest. Prior to this, the negotiating framework will have to be adopted by the Council and confirmed by the European Council. The decision on opening negotiations came after Belgrade and Pristina reached an agreement on normalising their relations in the framework of the EU-facilitated dialogue in April 2013. As of 25 September, the European Commission and Serbia has launched the screening of the “acquis” – the analytical examination, chapter by chapter, of the entire EU legislation – a process which will span over some 18 to 21 months, starting with Chapter 23 – judiciary and fundamental rights on 25 and 26 September. The framework for negotiations between EU and Serbia is currently actively discussed in the Council on the basis of the proposal that was tabled by the Commission on 22 July. It will have to be adopted by the Council and confirmed by the European Council in order to hold the first Inter-Governmental Conference on Serbia's accession negotiations in January 2014 at the very latest.

The Stabilisation and Association Agreement has entered into force on 1 September and Serbia has now a comprehensive framework in place to move closer to the EU and to prepare for its future participation in the Single Market, with all the benefits it offers to business and citizens. Serbia has a transitional economy mostly dominated by market forces, but the state sector remains large and many institutional reforms are needed. The economy relies on manufacturing and exports, driven largely by foreign investment. After renewing its membership in the IMF in December 2000, Serbia continued to reintegrate into the international community by rejoining the World Bank (IBRD) and the European Bank for Reconstruction and Development (EBRD). Serbia has made progress in trade liberalization and enterprise restructuring and privatization, but many large enterprises - including the power utilities, telecommunications company, natural gas company, national air carrier, and others - remain in state hands. Serbia is pursuing membership in the World Trade Organization, and accession negotiations are at an advanced stage. Structural economic reforms needed to ensure the country's long-term prosperity have largely stalled since the onset of the global financial crisis. Serbia, however, is slowly recovering from the crisis. The economy slipped 1.7% in 2012, following growth of 2.0% in 2011, 1.0% in 2010 and a 3.5% contraction in 2009. High unemployment and stagnant household incomes are

³ Source: "SERBIA 2012 PROGRESS REPORT", accompanying the document "Communication From the Commission to the European Parliament and the Council: Enlargement Strategy and Main Challenges 2012-2013" {COM(2012) 600 final}.

ongoing political and economic problems. End of June 2013, the government adopted a budget revision, increasing the 2013 general government deficit target from 3.6% to 5.2% of GDP, mainly because of revenue underperformance in the first months of the year. The government also adopted a public sector reform programme, including an action plan on completing enterprise restructuring by mid-2014. Following a 1.7% drop in output in 2012, Serbia went out of recession in the first quarter of 2013, with real GDP increasing by 2.1% year-on-year. Exports were the only driver of growth and increased by 13.5%, partly due to base effects. Exports' performance was strongly supported by the operation of a FIAT factory, which opened in the second half of 2012. Domestic demand remained very weak. Private consumption fell by 1.1% year-on-year, as labour market performance did not improve and real incomes continued to decline. Fiscal consolidation efforts and base effects (in anticipation of parliamentary elections, government expenditure were very high in the first half of 2012) have led to a 3.2% decline in government consumption. After a big drop in the last quarter of 2012, investment activity continued to decrease and gross fixed capital formation fell by 3.9%. In view of the weak and narrow-based recovery, imports growth remained subdued at 1.2% year-on-year. A number of sectors turned to growth in the first quarter. This was most visible in agriculture (up by 16.7%), which had suffered from bad weather conditions in 2012. However, key sectors like retail trade (-4.0%) and, in particular, construction (-24.7%) contracted further. Judging by high frequency indicators, domestic demand continued to fall in the second quarter. Retail trade turnover fell by 8.2% year-on-year in the first five months, although the decline decelerated to 3.8% in May. Industrial activity performed unevenly since the beginning of the year and, after several months of growth, declined by 0.5% year-on-year in May. Although manufacturing registered an increase of 5.0% in the first five months, more than half of its subsectors have been contracting, pointing at the fragility of the on-going recovery. In April, after unsuccessful attempts to re-privatise the company, the government restarted production at the loss-making steel mill in Smederevo. The unemployment rate remained very high at 24.1%, according to the April Labour force survey (LFS), lower than the 25.5% observed in April 2012 but above the 22.4% registered in October 2012. The highest rate of unemployment was registered in the age group 15-24 years (around 50%) and among those with medium educational level (26.2%). The number of employed increased by 3.2% in comparison to April last year and fell by 3.1% since the October 2012 LFS. Notably, over the last year, some businesses have moved to the grey economy, as according to the LFS, the share in total employment of people working in unregistered private businesses has steadily increased from 11.0% in April 2012 to 12.3% in April 2013. According to data on registered employment, since the beginning of the year, there was almost no change in the number of employed, which stood at around 1,716 thousand in April, or about 1% below its level a year ago. After a peak of almost 793 thousand persons in April, registered unemployment declined seasonally to 784 thousand in May. In line with the bleak employment situation, real wages continued to decline strongly. The average real gross wage fell by 6.2% in May year-on-year, bringing the accumulated decline in the first five months of the year to 4.8%. In the period January-April, the current account deficit has almost halved –it fell in Euro terms by 46% year-on-year to € 758 million. The improvement was driven mainly by a strong increase in the export of goods (23.8%) and private remittances (19.2%), while due to low domestic demand imports growth remained subdued (3.7%). In terms of GDP, the current account deficit narrowed to 8.5% in the four quarters to March, from 10.6% in 2012. The good exports performance in the first four months came mainly from two sectors -machinery, apparatus and transport equipment (up by 98%) and chemical products (up by 40%). Following completion of a major modernisation of the Pančevo refinery, exports of mineral fuels and lubricants have also gone up substantially (50%). However, exports of manufactured goods stagnated and traditionally strong exports of food declined by 20%. Inflation has remained high since the beginning of the year, averaging 11.5% year-on-year in the period until end of May. It decelerated to a single-digit level only in May (9.9%), driven mainly by a year-on-year fall in vegetable and meat prices. However,

food prices continued to contribute the most (4 percentage points) to the headline inflation. Anticipating a rapid inflation deceleration, the central bank lowered its key interest rate from 11.75% to 11.25% in May and down to 11.00% in June. Since late May, budget slippages and increased investors risk aversion towards emerging markets has put pressure on the dinar, which by early July lost 2.8% of its value against the euro, despite central bank interventions to smoothen excessive volatility.⁴

2.2 Funding trends

The goals of current research policy which should support solutions with all structural challenges, are: (1) the current 55-45% ratio of financing basic as opposed to applied research must progress to 40-60% in favour of applied science in the next five years; (2) Focus by setting seven national R&D priorities in the field of science and technology, for the period 2010-2015; (3) Strengthening of the human resource base by preventing brain-drain, establishing effective projects with leading individuals in the Serbian scientific Diaspora and identification, development and support for talented young researchers; (4) Partnership within the R&D system through rationalisation of the R&D network and close cooperation between institutes and faculties; (5) Partnership with society through science promotion; (6) Partnership with industry through an innovation fund, a new legal framework for intellectual property, and incentives and support for innovation activities; (7) Partnership with other ministries through the participation of the scientific community in major infrastructural and other projects in Serbia; (8) Increasing and diversifying R&D expenditure: The goal is to reach 1% of GDP for science by 2015, not counting infrastructure investments (SSTDRS, 2010).

Serbian budget allocations for science grew significantly, from the modest sum of €28m in 2001, to about €100m in 2008 and 2009 (data for the Ministry of Education, Science and Technological Development (MESTD) only). During that eight-year period, there was a substantial growth in salaries of researchers, and almost €30m were invested in capital equipment for scientific research work (SSTDRS, 2010).

The economic and financial crisis caused budgetary restrictions in the budget allocations for R&D and Innovation projects (co)financed by the MESTD in real terms: figure for 2011 remain almost the same as it was in 2010, but already contracted obligations for new selected and approved R&D projects (BR, TD, and IIR programmes) in 2011 were much higher than in 2010; therefore, the MESTD has prolonged public call for new innovation projects from 2011 to 2012. Funding from abroad, particularly from the EU (Framework Programme), or from other international sources became an important source of R&D funding in Serbia since 2006. The share of funding from abroad increased from only 2.64% in 2006 to 7.18% in 2009 because of the increase of success in competition for FP7 and other EU funds. Decrease in 2010 (3.58%) and 2011 (5.48%) is consequence of global financial crisis which affect Serbian economy and R&D system as well, but in 2012 has reached again significant share (9.19%).

According to the EUROSTAT data, in 2012 the share of higher education sector expenditures for Research and Development (HERD) was 46% of GERD (24% in EU27), much higher than the BERD share (25%) of GERD (63% in EU27). Governmental expenditure for R&D was 29% (12% in EU27).

⁴ More on these issues: Candidate and Pre-Accession Countries' Economic Quarterly 2/2013, European Commission, Economic and Financial Affairs Directorate-General Directorate D – International Economic and Financial Affairs Unit D1 – Candidate and Pre-Candidate Countries. KC-AO-13-002-EN-N, EU, 2013.

Main indicators for the regions in Serbia are provided in the table below for year 2011

	Serbia	City of Belgrade	Region of Vojvodina	Region of Šumadija and Western Serbia	Region of Southern and Eastern Serbia
Regional GERD as a percentage of GDP	0.96%	0.72%	0.17%	0.03%	0.03%
Regional BERD as a percentage of GDP	0.24%	0.23%	0.00%	0.00%	0.01%
Total R&D personnel (FTE) in the region	17730.0	10982.0	3840.5	996.6	1910.9

2. 2.1. Funding flows

The main R&D funding indicators and their evolution during the last four years in comparison with the corresponding EU average are given in table below.

Table 1. Basic indicators for R&D investments*

	2009 ⁽¹⁾	2010 ⁽¹⁾	2011 ⁽¹⁾	2012 ⁽¹⁾	EU (2012)**
GDP growth rate	-3.5	1.0	1.6	-1.7	0.4
GERD (% of GDP)	0.919	0.792	0.777	0.96	2.06
GERD (euro per capita)	35.53	29.67	32.49	39.7	525.8
GBAORD - Total R&D appropriations (€ million) ⁽³⁾	166.96	131.78	153.60	n/a	86,309.497
R&D funded by Business Enterprise Sector (% of GDP)	0.152	0.146	0.119	0.234	1.12 (2011)
R&D performed by HEIs (% of GERD)	54.78	51.70	56.71	46.21	24
R&D performed by Government Sector (% of GERD)	30.87	36.62	33.77	28.76	12
R&D performed by Business Enterprise Sector (% of GERD)	14.32	11.63	9.38	24.97	63
Share of competitive vs. institutional public funding for R&D	100% competitive funding	100% competitive funding	100% competitive funding	100% competitive funding	n/a
Venture Capital as % of GDP (Eurostat table code tin00141)	n/a	n/a	n/a	n/a	0.077 (2012) ⁽³⁾
Employment in high- and medium-high-technology manufacturing sectors as share of total employment (Eurostat table code tin00141)	n/a	n/a	n/a	n/a	5.6 (2011) ⁽³⁾
Employment in knowledge-intensive service sectors as share of total employment (Eurostat table code tsc00012)	n/a	n/a	7.2 ⁽³⁾	n/a	38.9 (2011) ⁽³⁾
Turnover from Innovation as % of total turnover (Eurostat table code tsdec340)	9.9 (2008) ⁽³⁾	n/a	n/a	n/a	14.4 (2010) ⁽³⁾

Sources: EUROSTAT and Statistical Office of the Republic of Serbia: yearly statistical bulletins on S&T activities in Serbia

Legend:

- (1) Data Source: Statistical Yearbook of the Republic of Serbia, Statistical Office of the Republic of Serbia, Belgrade
- (2) There is no official data collected and calculated GBAORD figures for Serbia. Data presented in this table are calculated by the author of this report. Calculation is based on data provided by the Statistical Office of the Republic of Serbia within regular yearly statistical reports on S&T activities in Serbia and under presumption that the only public funding source for R&D in Serbia is the Ministry of Education, Science and Technological Development (MESTD).
- (3) Data Source: IUS 2014 and IUS 2013 database

2.2.2. Funding mechanisms

2.2.2.1 Competitive vs. institutional public funding

Investments in R&D and innovation in Serbia from public sources are prioritised and budgeted in the framework of multi-annual plans to ensure predictability and long term impact. Project financing based on open competition for R&D and Innovation projects is decade's long practice in Serbia. There is no institutional, or block funding for R&D and Innovation activities in Serbia. Programmes for the support of R&D and innovation activities (co)financed by the MESTD, the Ministry of Economy (ME) and the National Agency for the Regional Development (NARD) are not sector-specific.

2.2.2.2 Government direct vs indirect R&D funding⁵

The only tax incentive related to R&D and innovation activities in Serbia is addressed to organisations registered for R&D activities as non-profit organisations. These organisations are not obliged to pay taxes for R&D services they provide to clients under non-profit contracts.

2.2.3 Thematic versus generic funding

Distribution of the public budget spent by the MESTD is the following:

1. Human Resources for Research and Innovation;
2. R&D;
3. Technology and knowledge transfer;
4. Infrastructure for Research and Innovation;
5. Creation and growth of enterprises;
6. Intellectual Property.

The above structure should be modified with additional spending for R&D and Innovation infrastructure which is result of the mentioned agreement with the European Investment Bank and the Council of Europe Development Bank with a total value of €305m to be implemented in 2010-2015 - the biggest share should go to expenditures for "Infrastructure for Research and Innovation". Detailed information necessary for calculations of percentage shares of real expenditures on policy priorities for R&D and Innovation activities in the Republic of Serbia are not publicly available.

Since the adoption of the national R&D strategy, covering the time period 2010-2015, several changes in budgetary commitments have been introduced (SSTDORS, 2010). A new grant program for interdisciplinary and integral research has been introduced, taking up almost a third of national R&D financing addressed to realisation of the R&D and Innovation projects. The programme is meant to bring together large teams from different institutions in addressing Serbia's R&D priorities. The remainder of project financing is split almost equally between basic and applied research. A small portion of the national RDI budget (about 2%) is spent on innovation projects. Unfortunately, because of lack of financial data (regular annual report is consist of one figure as total for financing of all R&I activities, without details neither by the

⁵ **Government direct R&D funding** includes grants, loans and procurement. **Government indirect R&D funding** includes tax incentives such as R&D tax credits, R&D allowances, reductions in R&D workers' wage taxes and social security contributions, and accelerated depreciation of R&D capital.

horizontal objectives nor by S&T priorities) it is not possible to establish relationship between S&T priority fields and horizontal objectives.

2.3 Research and Innovation system changes

The structure of the policy coordination mechanisms remain unchanged last decade: the first level of research governance is the Serbian National Parliament, the highest legislative authority in the country, and the Committee for S&T Development reviews and proposes to the Parliament the laws regulating the area of science, technology and innovation. The Ministry of Education, Science and Technological Development (MESTD) governs the functioning and development of S&T in Serbia and is responsible for fulfilment of the country's obligations in this area. On the other hand, the main task of the National Council for S&T Development is to design and propose to the government a strategy for S&T development and to monitor its implementation.

The major recent institutional change in Serbian research system is change of the governing ministry. Year 2012 was regular election year in Serbia, new parliament, new government and new president of the country are elected and as consequence of this elections, former Ministry of Education and Science (MES) is transformed into the Ministry of Education, Science and Technological Development (MESTD). The MESTD, according to the Law of the Ministries ("Official Gazette of the Republic of Serbia", 72/2012), has been established on 26 July 2012. Just one year later, after several months of consideration within the ruling coalition and a heated three-day debate in parliament, Serbia's reshuffled cabinet is primarily expected to accelerate the country's European integration and bring about the recovery of the ailing economy. The epilogue of the government reshuffle is that it now has one party less – United Regions of Serbia – but also 11 new cabinet members, out of whom as many as six are non-party figures, which is a departure from previous Serbian governments. The cabinet is spearheaded by the Serbian Progressive Party and the Socialist Party of Serbia. The reshuffled cabinet has 18 ministries and 22 members, unlike the previous one that had one ministry less and three fewer members, and was appointed with the support of 134 of the parliament's 250 MPs. The Minister of Education, Science and Technological Development Zarko Obradovic has been replaced by the Tomislav Jovanovic on September 2, 2013.

2.4 Recent Policy developments

The R&D and Innovation activities in Serbia in the period 2011-2014 are structured through the following major policy measures:

1. Policy measures for R&D activities launched by the MESTD (responsible institution is the MESTD):

- "Programme supporting Basic Research for the Research Cycle 2011-2014" ["BR Programme"]. The "BR Programme" has been established by the Minister of Education, Science and Technological Development as an obligation defined within Article 10, paragraphs 4, 27 and 105 of the Law on Scientific Research. The previous programme for support of basic research in Serbia has covered the period 2006-2010, ending by December 31st, 2011. The BR programme is a continuation of funding of basic research in Serbia for the next four years. The priority research fields are defined within the "Strategy of S&T Development of the Republic of Serbia 2010-2015" [SSTDRS]. Procedures for selection, evaluation and funding are defined within the "Act on

Selection, Evaluation and Funding of Programme of Basic Research for the Research Cycle for the Time Period 2011 – 2014”;

- “Programme supporting Research in the Field of Technological Development for the Research Cycle 2011-2014” [“TD Programme”]. The “TD Programme” has been established by the Minister of Education, Science and Technological Development as an obligation defined within Article 10, paragraphs 4, 27 and 105 of the Law on Scientific Research. The previous programme for support of research in the field of Technological Development in Serbia has covered the period 2006-2010, ending by December 31st, 2011. The TD programme is a continuation of funding of basic research in Serbia for the next four years. The priority research fields are defined within the “Strategy of S&T Development of the Republic of Serbia 2010-2015” [SSTDRS]. Procedures for selection, evaluation and funding are defined within the “Act on Selection, Evaluation and Funding of TD Programme for the Research Cycle for the Time Period 2011 – 2014”;
- “Programme of Co-Funding of Integrated and Interdisciplinary Research for the Research Cycle 2011-2014” [“IIR Programme”]. The “IIR Programme” is a new programme for supporting the integration of basic, applied and development research as well as for fully utilising R&D resources of the country, emphasising commercialisation of R&D activities and results;
- “Programme of Providing and Maintaining Scientific Research Equipment and Scientific Research Facilities for the Research Cycle 2011-2014” [“SREF Programme”]. The “SREF Programme” is a new programme for improving the material base of basic, applied and development research as well as for fully utilising R&D equipment and infrastructure in the country.

2. Policy measures for Innovation activities:

- Programme for Supporting SMEs and Entrepreneurs to Strengthen Innovation Activities in 2011 (responsible institution is the National Agency for the Regional Development). This programme is more oriented to support non-technological innovation activities. The focus is on service and organisational innovations as well as efficient adoption of quality standards;
- The MINI GRANTS and MATCHING GRANTS Programs – Public call for the MINI GRANTS programme is launched in December 2011; Public call for the MATCHING GRANTS programme was launched in spring 2012 (responsible institution is the Innovation Fund). The Mini Grants Program provides unconditional grants up to €80,000 to innovative start-ups with a mandatory 15% of co-financing from the company. The Matching Grants Program is a conditional grant with a 5% royalty component, with project of up to €300,000 and a mandatory 30% co-financing from the company. Both programmes have been developed with international advisors and according to World Bank international best practices;
- The Programme for co-financing of the Innovation projects – Public call for this programme is launched in December 2011 (responsible institution is the MESTD). This programme has been established by the MESTD as obligation defined by the Articles 36 of the Innovation Law (“Official Gazette of RS”, nos. 110/05 and 18/10). The total budget spent by the MESTD for innovation activities was €1.4m in 2009. The MESTD planned budget was nothing for innovation activities in 2011, therefore public call for innovation projects launched in December 2011 was an invitation for innovation projects which will be funded €1.79m from the budget allocated for the years 2012 and 2013.

The only tax incentive related to R&D and innovation activities in Serbia is addressed to organisations registered for R&D activities as non-profit organisations. These organisations are not obliged to pay taxes for R&D services they provide to clients under non-profit contracts.

The list of policy documents that are published in IIMS represents the full range of important research and innovation policy documents regarding R&D and Innovation activities in Republic of Serbia created in the period 2010-2012. The inventory is consisting of the following documents:

1. Strategy of Scientific and Technological Development of the Republic of Serbia 2010-2015 (SSTDRS, 2010), published on September 22, 2010;
2. Law on Scientific and Research Activities (Science Law), published on September 22, 2011;
3. Law on Innovation Activities (Innovation Law), published on September 22, 2011;
4. Act on the selection, evaluation and financing of research for the project cycle 2011 – 2014, published on July 12, 2011.

In addition, the Strategy of Development of Education in the Republic of Serbia by the year 2020 (SDERS) was recently completed by the Ministry of Education, Science and Technological Development (MESTD) and approved by the government in autumn 2012. Main parts of this strategy includes: (a) Strategy of development of the primary and secondary education; (b) Strategy of development of the high education; (c) Strategy of development of the “life long learning” system in the country; (d) Strategy of financing of education in the Republic of Serbia.

2.5 National Reform Programme 2013 and R&I

Serbia is a candidate country for EU membership, therefore there is no National Reform Programme created in the form member countries agreed in 2013. Nevertheless, global economic crisis hit economy in Serbia as well, and influenced government actions which are already directed toward reforms in economy and society. The economic and financial crisis caused budgetary restrictions in the budget allocations for R&D and Innovation projects (co)financed by the MESTD: figures for 2011 and 2012 remain almost the same as it was in 2010, and this is in fact decrease of public finance in real terms due to significant rate of inflation (increase of consumer price indices was 6.5% in 2010, 11% in 2011, and 7.8% in 2012).

Important support for major reforms in Serbia came recently (December 23, 2013) from EU: the European Commission has adopted the 2013 national programme for Serbia under the Instrument for Pre-accession Assistance (IPA). The €178.7 million programme will help Serbia implement reforms in key areas such as rule of law, public administration, social inclusion, private sector development, transport, environment, energy and agriculture. These reforms are crucial elements of the country's European integration process and will directly improve the daily lives of Serbian citizens. With this agreement, the EU's pre-accession assistance for Serbia since 2001 has reached €2.6 billion.

The programme will help Serbia in the area of rule of law by supporting the implementation of national strategies for the fight against corruption, improving the prison system and strengthening the independence and competence of the judicial system. Funds will also be used to strengthen the efficiency of the Serbian customs administration and border control facilities. The funds will also go to improve the capacity of the public administration at central and local

levels by developing the country's public finance management and public procurement. In addition, 34 municipalities in South and South West Serbia will be specifically targeted to develop local governance capacities, conditions for business and infrastructure development and support the implementation of social inclusion and employment policies.

The development of the private sector will be supported through measures that will improve the environment for doing business in Serbia, increase the competitiveness of Serbian enterprises and support investment in research and innovation. In the area of transport, navigation conditions on the Danube will be improved.

On top of the national IPA programme, EU funds for Serbia will also be available through the Civil Society Facility (€2.5 million), TEMPUS programme (€4 million), and funds for refugees under the Regional Housing Programme (€12 million).

EU support to key reforms in Serbia has no direct instrument for research and innovation sector in country, but could be used by this sector as well. Restructuring of public R&D system is temporary postponed due to economic crisis, although restructuring of public R&D system and integration of the business enterprise sector (BES) into national innovation system is primary task for the government defined by the latest S&T Strategy (SSTDRS, 2010). Following restructuring of the government in July 2012, it is reasonable to expect interventions from responsible ministries (mainly MESTD and ME) firstly to reinforced public financing of research and innovation activities, and re-start process of restructuring of public R&D system in 2014.

2.6 Recent evaluations, consultations, foresight exercises

Evaluations

One among the key challenges R&D and Innovation system in the Republic of Serbia is faced with is the creation of the evaluation standards and principles as well as instruments and mechanisms for implementation in monitoring and evaluation of innovation support measures. The accreditation procedure is obligatory for R&D, HE and registered innovation organisation: under the HE Law, for teaching competence: under the Science Law, for R&D competence; under the Innovation Law for innovation capacity. The permanent and transparent monitoring and evaluation practice in governance of innovation policy measures is urgently needed: there are no evaluation standards or institutions responsible for evaluation in the area of S&T and innovation in Serbia. Only ex-ante evaluations of innovation activities proposed under public calls for funding from the Ministry of Education, Science and Technology Development (MESTD) (former Ministry of Education and Science - MES), the Ministry of finance and economy (MFE) (former Ministry of economy and regional development - MoERD) and the National Agency for regional development (NARD) are regularly organised. Further monitoring of on-going activities, ex post and impact evaluation of innovation activities are organised as sporadic initiatives within EU sponsored projects. It is necessary to organise national programme for evaluation of innovation activities which are (co)financed from the public sources, with development of evaluation standards, identification and training of evaluators, establishment of legal framework for such activities, etc. The MFE annually making reviews of SMEs and entrepreneurship and related programs against the Strategy for the Development of Competitive and Innovative Enterprises (reports for 2008, 2009, 2010 and 2011 are available in Serbian). The only ex-post and/or impact evaluation activity in the period 2011-2013 is recently (end of 2011) completed within the Improved SME Competitiveness and Innovation Project (ICIP),

which is financed by the European Union and aims at improving the competitiveness of Serbian SMEs and increasing levels of innovation in SMEs. In total nine SME innovations and competitiveness support programmes have been evaluated that are implemented by the Government of Serbia and managed by the MFE, MESTD and NARD. The focus of the assessment was on the impact of observed nine programmes on the parties involved, specifically on the beneficiary enterprises and the innovation support organisations and consultants. Consequently, the methodology focused on effectiveness and efficiency of programmes, its management and capacities to operate the programmes, as well as on awareness of existing support measures; regarding the beneficiary enterprises, the methodology looked towards possible specialisation of support measures profiles, on closing gaps in the innovation assistance process and meeting the needs of beneficiary enterprises⁶.

Consultations, foresight exercises

Foresight as a methodological tool for consultations within R&D community as well as for consultations with all other interested stakeholders and communities in economy and society is not implemented in Serbia yet. Orientation on foreign programmes and projects (EU, WB, OECD, etc.) for support of innovation activities in the Republic of Serbia should be, at least, acknowledged by the domestic governing institutions, but major intervention in national innovation performance have to be harmonisation of overall and specific goals and activities of these projects with national priorities, needs and challenges. The optimal reaction to changes which are necessary to be done in that direction is launching of the first national S&T foresight exercise. Main outcomes and results of such foresight should be the identification of national innovation capacity and potentials, needs and challenges on the way toward creation of the national innovation system, selection of national priorities in R&D and Innovation, as well as creation of the first formal innovation policy document and establishment of the consultation and dialogue between RDI community and wider economy and society in Serbia.

2.7 Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3)

The smart specialisation approach for national/regional innovation strategies (RIS3) has not been followed in the design of strategic policy documents in Serbia so far. Since Serbia is a candidate country, the legally binding ex-ante conditionality for adopting RIS3 from the relevant EU regulation does not apply. The current approach in strategy and policy making process is traditionally based on expert opinion, without intersectoral dialogue, communication with wide public community for identification of bottom-up initiatives and priorities, scenario development, forecasting, and other future-oriented activities, which are commonly collected under foresight exercise umbrella.

The recent "Strategy of S&T Development of the Republic of Serbia 2010-2015" was prepared using the established top-down approach with contributions from informal panels for selected S&T fields. Other inputs were a strategic document prepared by the National Council for Scientific and Technological Development, as well as numerous meetings and round tables with domestic and foreign scientists, businessmen, statesmen, members of the civil society and many

⁶ The document "Assessment of Innovation and Competitiveness Support Programmes, Serbia – Recommendations and Proposed Corresponding Actions" is available on the Internet: <http://www.icip-serbia.org/assets/Uploads/Summary-Report-WS-Results111022-FINAL-compressed.pdf>.

others. Public debate on the strategy was constructive and lasted from June 29th, 2009 until the end of November of 2009. Hundreds of comments were sent to the ministry by an online forum and e-mail from scientists, businessmen, foreign partners and science policy makers from all over the world. There is clearly expressed political will that the first foresight exercise in S&T in Serbia should be launched in future, possibly for creation of the (first) innovation policy in Serbia (during 2014).

The main policy document in the area of S&T and Innovation is the “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTD RS, 2010). ”The Strategy is guided by two basic principles: focus and partner. Focus through defining a list of national research priorities in which we (i.e. R&D system in Serbia) can and must make significant progress. Partner through strengthening ties with institutions and companies to allow Serbia to validate its ideas in the global market”.

National priorities in the domain of S&T, defined in S&T Strategy are: (1) Biomedicine and human health; (2) New materials and nanosciences; (3) Environment protection and countering climate change; (4) Agriculture and food; (5) Energy and energy efficiency; (6) ICT; and (7) Improvement of decision making processes and affirmation of national identity⁷.

Research governance was transferred to the level of Autonomous Province of Vojvodina (APV) to a limited extent, as it was defined by the “Law on regulation of jurisdictions of the APV”, adopted by the Parliament of the Republic of Serbia on November 30, 2009: 1) creation of the Strategy for technological development of the APV, which must be harmonized with the national S&T strategy; 2) (co)funding of establishment of high-tech installation, building of homes for young scientists, and international S&T cooperation; 3) (co)funding of R&D activities; 4) definition and funding of programmes important for APV in the area of S&T; 5) project financing for R&D projects important for APV; 6) financing of capital expenses and R&D infrastructure established by the APV; 7) establishment of the innovation fund in APV, based on local revenues; 8) establishment of local R&D centres and popularization of S&T activities in APV; 9) financing of Academy of Sciences and Arts of the APV. Some of these activities could be co-financed by the MESTD under the specific decision made by the Minister. The main policy document in the area of S&T and Innovation in the APV is the strategy document: “Basic Directions of Technology Development of AP Vojvodina” (<http://apv-nauka.ns.ac.rs/images/dokumenti/StrategijaOsnovniPravciRazvoja.pdf>, available only in Serbian language). This strategy document is adopted by the Assembly of the APV in spring 2007. Revision of this document is completed in December 2013.

⁷ There is detailed explanation for this priority within METRIS COUNTRY REPORT Social Sciences and Humanities in SERBIA 2011 Report with five sub-priorities related to Social Sciences and Humanities in Serbia.

3 PERFORMANCE OF THE NATIONAL RESEARCH AND INNOVATION SYSTEM

3.1 National Research and Innovation policy

In 2012, Serbia's GERD as a percentage of GDP was 0.96% which was significantly lower in comparison to the EU27 average (2.06%) but it is significant increase compared to previous two years: in 2011 GERD was 0.77% and in 2010 GERD was 0.792%, or almost one fifth less than in 2009 (0.919%), as direct consequence of economic crisis on GDP and overall economic performance in country. The main characteristics of these investments are change and instability i.e. in 2004 Serbia's GERD as a percentage of GDP was 0.32%, in 2006 it increased to 0.717%, in 2007 decreased to 0.641% and in 2008 increased to 0.732%. Comparing to other Eastern European Countries, Serbia significantly lags behind Slovenia (2.8%), Czech Republic (1.88%), Estonia (2.18%), and Hungary (1.22%).

According to the latest national statistical data (December 2013), in 2012 the share of higher education sector expenditures for Research and Development (HERD) was 46% of GERD (24% in EU27), much higher than the BERD share (25%) of GERD (63% in EU27). Governmental expenditure for R&D was 29% (12% in EU27).

Serbian budget allocations for science grew significantly, from the modest sum of €28m in 2001, to about €100m in 2008 and 2009 (data for the Ministry of Education, Science and Technological Development (MESTD) only). During that eight-year period, there was a substantial growth in salaries of researchers, and almost €30m were invested in capital equipment for scientific research work (SSTDRS, 2010). The Project of Infrastructural Investments, worth EUR 400 million started in January 2010 and will last until the end of 2015 (SSTDRS, 2010).

According to the data of the Republic Statistics Office, in 2012 Serbia had 13,249 researchers in total 11,615 of which were engaged in MESTD projects. The average age of the researchers was 44.3 years, which was above the average age of the population in country, pointing to the need for taking action to provide and nurture young scientific researchers.

The Science Law, adopted by the Parliament in 2005, promoted excellence in R&D work; imposing publishing of scientific articles in ISI referred scientific journals as a precondition for career advancement in the R&D sector. A direct empirical consequence of such regulation was a large increase in the number of publications. Thus, the figure of 1022 scientific papers published in 2000, grew to 3,614 in 2010. Following the Essential Science Indicators from Thomson Reuters, ScienceWatch.com produced a listing of the scientists, institutions, countries, and journals that achieved the highest percentage increase in total citations from the second bimonthly period of 2011 to the third bimonthly period of 2011- i.e., from April 2011 to June 2011. Serbia's citation rise continued, as it achieved the highest percent citation increase in nine fields. Serbia has achieved Rising Star status in multiple fields: Agricultural Sciences, Biology & Biochemistry, Chemistry, Clinical Medicine, Computer Science, Engineering, Materials Science, Neuroscience & Behaviour, Pharmacology & Toxicology, and Physics.

The number of patents registered by R&D organizations in the period from 2003-2009 was just 54; while in the period 2002-2008 over 3,400 technical solutions were implemented in the field of technological development in Serbia. The relevant figures in the corporate sector were not remarkably better, with about 20 patents registered per year, while individuals registered more

than 300 patents in the same period. In the year 2011 in total 229 patent applications were filled in the Intellectual Property Office out of which 180 were resident (151 patent applications filled by individuals, 21 by R&D organisations and 8 by companies) and 49 non-resident patent applications⁸. In view of such results, Serbia was at the bottom of the list in Europe.

According to Innovation Union Scoreboard IUS2014, Serbia is one of the moderate innovators with a below average performance: Summary Innovation Index is 0.358, increase from 0.344 in 2012, 0.282 in 2011 and 0.284 in 2010. Innovation performance has increased over the whole period due to increases in Innovative SMEs collaborating with others, Product and/or process innovators and Marketing and/or organisational innovators. The country relative performance to the EU has improved from 48% in 2007 to 65% in 2013. Serbia performs very well in Youth education, and Employment in knowledge-intensive activities and innovation performance has been improving rapidly at an average annual growth rate of 5.5%.

Relative strengths are in Non-R&D innovation expenditures, Employment in knowledge-intensive activities and Youth with upper secondary level education. Relative strong weaknesses are in Community designs, Community trademarks and R&D expenditures in the business sector. Performance in terms of growth has been positive in Serbia for most indicators. High growth is observed for Community trademarks, SMEs with Marketing and/or Organisation innovations, Innovative SMEs collaborating with others and R&D expenditures in the public sector. Declines in growth are only observed for Knowledge-intensive services exports and Non-EU doctorate students.

Table 2: Innovation Union Scoreboard IUS2014: Selected indicators for Serbia ⁽¹⁾

ENABLERS	
Human Resources	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	0.7
Percentage population aged 25-64 having completed tertiary education	24.7
Youth with upper secondary level education	83.4
Open, excellent and attractive research systems	
International scientific co-publications per million population	45.2
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	n/a
Non-EU doctorate students	7.1
Finance and support	
R&D expenditure in the public sector as % of GDP	0.72
Public Funding for innovation (innovation vouchers, venture/seed capital, access to finance granted by the public sector to innovative companies)	n/a
FIRM ACTIVITIES	
Firm investments	
R&D expenditure in the business sector as % of GDP	0.24
Non-R&D innovation expenditure	1.06
Linkages & entrepreneurship	
SMEs innovating in-house	30.6
Innovative SMEs collaborating with others	7.5
Public-private co-publications per million population	2.6
Intellectual assets	
PCT patents applications per billion GDP (in PPSE)	n/a
PCT patents applications in societal challenges per billion GDP (in PPSE) (climate change mitigation; health)	n/a
Community trademarks	0.76
Community designs	0.01
OUTPUTS	

⁸ Intellectual Property Office of the Republic of Serbia and MESTD, combined data.

Innovators	
SMEs introducing product or process innovations	36.0
SMEs introducing marketing/organisational innovations	39.1
Employment fast-growing firms of innovative sectors	n/a
Economic effects	
Employment in knowledge-intensive activities	14.4
Contribution of Medium and high-tech (MHT) product exports to trade balance	-3.50
Knowledge-intensive services exports as % total service exports	45.2
Sales of new to market and new to firm innovations	11.7
License and patent revenues from abroad as % of GDP	0.31

Legend:

(1) Data Source: IUS 2014 database

3.2 Structural challenges of the national R&I system

The innovation landscape in Serbia could be succinctly described with the fact that no innovation policy in the country has been officially and formally approved by the central government or any ministry or parliament. Nevertheless, the official attempts to create a national innovation policy were registered two times since 2000 year: the very first effort was in 2003, with a working document prepared by the (then) Minister for S&T and Development (due to the change of the government, and new political party in power, this document remained as a draft, without official recognition); the second attempt was initiated by an EU funded project managed by the European Agency for Reconstruction in Serbia ("Support to Enterprise Development and Entrepreneurship – Serbia", 2005-2006) in 2006, with the aim to build a "National Innovation Strategy for Serbia", which failed too (the mentioned document remained a draft text, as consequence of the government stopped activities). The second attempt was also influenced by the legal obligation defined by the first Innovation Law adopted in Serbia in 2005 (Law on Innovation Activity, "Official Gazette of the RS", No. 110/2005; this law has been recently moderately changed: "Official Gazette of the RS", No.18/2010: "The ministry in charge of the scientific and research activity and technological development shall be responsible for establishing and implementation of the innovation policy" - Article 6).

Summarising, the key structural challenges faced by the national innovation system in Serbia can be grouped into the following issues:

1. Absence of the formal innovation policy in the country which should be officially approved by the central government or any ministry or parliament so far.

Creation of the first innovation policy in Serbia for more efficient and effective use of public budget and national innovation resources and capacities should be one major priority for governing institutions in country. A possible solution for this challenge is clearly defined responsibility and assigned task within national government, eventually in 2014.

2. Absence of coordinated governance and funding of national innovation system in Serbia between main ministries and public funding sources: The Ministry of Education, Science and Technological Development (MESTD), The Ministry of Economy and Regional Development (MFE), National Agency for the Regional Development (NARD), and recently (in March 2011) (re)established the Innovation fund.

The concept, purpose and functioning of innovation is not sufficiently developed and accepted in the economy and the society in Serbia. Therefore, the development of the national innovation system in Serbia is currently in a phase of conceptualisation and far from

being operational and functional. The absence of a formal innovation policy leads to a situation, in which the governance of innovation activities in Serbia is not structured, organised and budgeted between responsible ministries and agencies.

Because of fact that NARD is organisationally subordinated by the MFE, funding and governance activities between these two institutions are fully synchronised. The main challenge in near future is establishment of the coordination between the MESTD, MFE and NARD. A possible solution could be mutual participation of representatives from both ministries and NARD in policy related bodies (councils, committees, etc.) in order to harmonise both measures and finance addressed to same clients / users of public budget.

3. Another important challenge is the government approach to R&I which could be elaborated as a linear understanding of the innovation process and is highly fragmented; this is the main obstacle for networking of R&D sector with the rest of economy and society, i.e. R&D sector and business sector in Serbia are separate and mutually independent, without any aspiration for cooperation.

Existing instruments and mechanism are more oriented to preserve the situation rather than convert this into a networked, mutually dependent cooperation. This situation is particularly evident in the R&D sector with strong orientation of R&D community, enhanced by the Science Law and criteria for advancement in research career based on articles published in scientific publications, rather than technology development and innovation.

The direct consequences of the obstacles shown above are the preservation of a role and structure of a R&D system that had been created in a time of a quasi-market economy. A crucial challenge for research governance in Serbia is the question of how to increase R&D and Innovation activities in the Business Enterprise Sector (BES). Official figures (Statistical Office of the Republic of Serbia: Bulletin on S&T activities in Serbia in 2011) showed that BERD share in GERD was only 9.38% in 2011, compared to 62.07% in EU. Although recent R&D and Innovation surveys support findings with a different situation in BES, i.e. investments in R&D and innovation in this sector are much higher than official statistics shows, and further investigations to reveal of the real situation in R&D and Innovation investments in BES in Serbia are needed, still scope and level of investment in R&D and innovation activities in BES in Serbia is far from needed.

The MESTD has implemented the “Law on innovative activities” and “Law on intellectual property rights (IPR)” in order to create a mechanism for more intensive linkage of science, research and innovation with the wider economy. The laws stipulate among other things: Strategic changes of the method of funding, partly oriented to the entities in the economic sector as the proponents of innovation projects; Regulation of IPR protection, under the joint projects between the corporate sector and R&D organisations; Formation of joint investment funds for financing the innovation projects. Through the future action plan under this strategy and in cooperation with the Ministry of Finance and Economy, taxation and budgetary incentives for investment into science and research shall be pursued. The proposals of the MESTD are as follows: The investment by corporations into projects involving science research organisations, which are co-financed by MESTD shall be free of corporate profit tax (recognised as a cost); Employment of young researchers registered in the projects of MESTD in the private sector enables the private sector to give salaries for two years free of contributions and taxes (payable by the employer); Should an enterprise choose to fund an employee’s doctoral studies MESTD would bear up to one half of the costs; Young researchers registered by the MESTD, who would incorporate their own enterprise, would be exempt from paying income and profit tax up to the age of 30. After that, they will be transitioned to standard progressive taxation within 5 years; MESTD would

cover the costs of patent applications and other forms of protection of intellectual property for projects co-financed by MESTD (SSTDRS, 2010).

4. According to MESTD, one of the significant problems in preserving and strengthening the scientific community is the ongoing drain of highly educated individuals from the country. In the period 1990-2000, about 73.000 inhabitants left Serbia, and among them 17,000 had university degrees. This emigration trend continued after 2000, with some 50,000 people leaving, of which about 2,000 were university graduated (SSTDRS, 2010). The majority of the highly educated emigrants are from the area of engineering and technological studies and from the area of natural sciences. It is exactly for these reasons that a change has to be introduced in the High Education (HE) policies, including the introduction of initiatives aimed at keeping the best graduates and researchers in the country, along with the adoption of a long-term plan for the return of scientists from the Diaspora. MESTD just launched (in 2011) the project which will engage Serbian Diaspora in joint projects, to transfer their knowledge and skills for the benefit of Serbian society, as well as to motivate the scientists to return to Serbia.
5. The attractiveness of R&D system in Serbia for private investments in R&D is insufficient because of the present structure and capacities of public R&D system. Restructuring of public R&D system and integration of business enterprise R&D sector into national innovation system is the strategic orientation of government as articulated in a Strategy for S&T development of the Republic of Serbia until 2015. In addition, the legal framework is not favourable to private sector engagement in R&D and innovation activities because of the following:
 - Legal barriers to companies to apply for public funds for R&D and innovation activities: according to the Innovation law, there is a formal obligation for companies to be registered in the MESTD innovation register in order to be eligible for competition under public calls for co-financing of the innovation grants. Direct consequence of this regulation is that less than 100 companies out of more than 100,000 companies in Serbia are registered in the MESTD innovation register, and only these companies could apply for innovation grants funded by the MESTD. Partly, this problem is resolved with funding from the Innovation Fund which operates under the combination of national and international laws in order to comply between foreign donors request to be opened for all innovative companies in Serbia, and avoid national Innovation law which is highly restricted in that sense;
 - Legal framework for risk and venture capital investments in R&D and innovation activities is not transparent enough and fully adapted to the “rules of the game” in market economy: practically, there is no law which regulates venture capital and other risk investments.
6. Undeveloped infrastructure for innovative entrepreneurship and lack of culture for technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations) is another structural challenge in Serbian R&D and innovation landscape.

Crucial steps forward in order to create an environment to support technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations) are the changes in HE Law and Innovation Law which stimulates and legally approves creation of university and PROs spin-offs. There are just few examples of spin-offs initiatives, such as within University of Novi Sad - Faculty of Technical Sciences and “Mihajlo Pupin” Institute in Belgrade. Only two Technology Transfer Offices (TTOs) are established within University of Novi Sad and University of Belgrade (in 2010) so far. Initiatives and support for establishment and efficient functioning

of several more TTOs in Serbia could be expected within recently (January 2014) launched Danube-INCO.net project.

Overall assessment is that most of the private HE institutions are so-called “teaching” faculties/universities, with transmission of knowledge (teaching) as primary and only activity. Other two main missions: generation of new knowledge (research) and the 'third mission' (contribution to local or regional wealth and economic development) are mostly present in some of public HE institutions;

7. Lack of demand-side R&D and innovation policy tools and measures in Serbia is one of the key obstacles for development of the national innovation system. Key barriers in implementing demand-side policies in Serbia, besides absence of the innovation policy are: (1) (traditional) separation between R&D sector and business sector; (2) legal obstacles (the rules defined in the Innovation law in sense of obligation for companies to be registered in the MESTD innovation register); (3) lack of public awareness of the need for such policies.

Still, there are no national guidelines issued in any fields of demand-side innovation policy, neither indicators defined to capture the impact of demand-side innovation policies, nor specific national studies conducted in the topic of demand-side innovation policy issues.

8. Absence of evaluation culture and practice in R&D and innovation system in Serbia: besides accreditation procedure (obligatory under the HE Law), for teaching competence, and under the Science Law, for R&D competence, there is no specific evaluation of teaching and R&D performance of HE institutions in Serbia. Other R&D and innovation organisations are obliged to pass regular, rather formal accreditation procedure which is legal obligation under the science and innovation laws. The introduction of permanent and transparent monitoring and evaluation practice in governance of innovation policy measures is urgently needed: there are no evaluation standards as well as institutions responsible for evaluation in the area of science, technology and innovation in Serbia. Only ex-ante evaluations of innovation activities proposed under public calls for funding from the MESTD, MFE and NARD are regularly organised. Further monitoring of on-going activities, ex post and impact evaluation of innovation activities are organised as sporadic initiatives within EU sponsored projects;
9. Insufficient knowledge about R&D and innovation capacities in business sector: recognition of resources and capacities of business enterprise R&D sector and integration with public R&D organisations could strengthen overall R&D and innovation system in Serbia;
10. Recognition of the needs for financing of innovation activities with a much larger budget and significantly increased financing per innovation grant. Innovation activities in companies are co-financed from public sources up to several thousand Euros (the MFE and NARD public calls for financing innovation activities in companies for years 2009, 2010, 2011, 2012), which is not enough for significant innovations;
11. Lack of demand-side R&D and innovation policy tools and measures in Serbia: administration and good governance in harmonisation between supply and demand-side innovation policy tools and measures are needed. Possible solution is development of integral innovation strategy and policy with an appropriate action plan which will stress demand-side as well as supply side innovation policy tools and measures.

3.3 Meeting structural challenges

Following the taxonomy developed within the “Policy Mix” Project⁹, evolution and analysis of the policy mixes in Serbia will be based on existing policies in country which could be grouped into four groups:

- A. Inputs: the impact of policy mixes on financial and human resource inputs; policies related to the knowledge inputs needed for the national innovation system to function properly;
- B. Internal Flows - Input/Output Transformations: policies related to the knowledge production and internal flows of finance, human resources and knowledge;
- C. Outputs: policies related to knowledge circulation, i.e. the transfer, diffusion and utilisation of knowledge outputs;
- D. Matching Supply and Demand: policies related to the mechanisms in place to articulate the demand for knowledge, but it could also cover the articulation of supply side capabilities and the processes in place to ensure that both resource mobilisation and knowledge production are in line with expected demand. It could also cover the policies needed to stimulate the demand for R&D.

Key resources for the effective functioning of R&D and innovation system are: finance, human resources, knowledge. Key processes for the effective functioning of R&D and innovation system are: resource mobilisation, knowledge demand, knowledge production, and knowledge circulation.

Inputs: Policies related to knowledge inputs needed for the national innovation system in Serbia

The R&D and Innovation activities in Serbia in the period 2011-2014 are structured through the following major policy measures:

1. Policy measures for R&D activities launched by the Ministry of Education and Science (MES):

- a. “Programme supporting Basic Research for the Research Cycle 2011-2014” [“BR Programme”];
- b. “Programme supporting Research in the Field of Technological Development for the Research Cycle 2011-2014” [“TD Programme”];
- c. “Programme of Co-Funding of Integrated and Interdisciplinary Research for the Research Cycle 2011-2014” [“III Programme”];
- d. “Programme of Providing and Maintaining Scientific Research Equipment and Scientific Research Facilities for the Research Cycle 2011-2014” [“SREF Programme”];

2. Policy measures for Innovation activities:

- a. Programme for Supporting SMEs and Entrepreneurs to Strengthen Innovation Activities in 2011 (responsible institution is the National Agency for the Regional Development);
- b. The MINI GRANTS and MATCHING GRANTS Programs – Public call for the MINI GRANTS programme is launched in December 2011, Public call for the MATCHING GRANTS programme is about to be launched in spring 2012 (responsible institution is the Innovation Fund);
- c. The Programme for co-financing of the Innovation projects – Public call for this programme is launched in December 2011 (responsible institution is the MES).

⁹ Ken Guy, Patries Boekholt, Paul Cunningham, Reinhold Hofer, Claire Nauwelaers, and Christian Rammer. 2009. *Designing Policy Mixes: Enhancing Innovation System Performance and R&D Investment Levels. Methodology Deliverable, Task 3.* The “Policy Mix” Project. European Commission, DG Research, March.

Major changes in the R&D and innovation policy mix are:

- The “IIR Programme” is a new programme for supporting the integration of basic, applied and development research as well as for fully utilising R&D resources of the country, emphasising commercialisation of R&D activities and results;
- The “SREF Programme” is a new programme for improving the material base of basic, applied and development research as well as for fully utilising R&D equipment and infrastructure in the country;
- The MINI GRANTS Programme launched by the Innovation Fund will award selected innovation projects with substantially larger amounts of money per grant in comparison with all past and on-going innovation projects, i.e. up to €80,000. [Innovation projects granted by the Ministry of Finance and Economy (MFE) and the National Agency for the Regional Development (NARD) could be up to €10,000; the MESTD grant for the innovation project could be up to app. €30,000];
- The MINI GRANTS Programme overcomes the legal obstacle that resulted from the rules defined in the innovation law. This implies, in particular, the obligation for companies to be registered in the MESTD innovation register in order to be eligible for the competition under public calls launched by the MESTD. As this programme is administered by an agency independent from the MESTD, the applicant companies have no obligation for such a registration;
- The Programme for Supporting SMEs and Entrepreneurs to Strengthen Innovation Activities, launched in 2011 by the National Agency for the Regional Development, is more oriented to support non-technological innovation activities. The focus is on service and organisational innovations as well as efficient adoption of quality standards.

Fiscal Policies

The only tax incentive related to R&D and innovation activities in Serbia is addressed to organisations registered for R&D activities as non-profit organisations. These organisations are not obliged to pay taxes for R&D services they provide to clients under non-profit contracts.

Human Resource Policies

Two demographic factors sound major warnings for research governance in Serbia. According to the projection of the Republic Statistics Office (RSO), the population of Serbia will decrease by about 2% every five years; in other words, in 2022 Serbia will have 6.3% fewer inhabitants than in 2010. Additionally, the average age of the whole population is 41.4 (in 2002 it was 40.25), classifying Serbia among the countries with an older populations. The average age of the researchers is 44.3 years, which is above the average age of the population as a whole, pointing to the need to take action to support and nurture young scientific researchers (SSTDRS, 2010).

MESTD has launched a special programme for the development of human capital in Serbia (app. €33m have been set aside for this task) with four main lines of investment in the period 2010-2015:

1. A human resources programme which will engage individuals in Serbian scientific Diaspora in joint projects and other initiatives, to transfer their knowledge and skills for the benefit of Serbian society, as well as to motivate these scientists to return to Serbia. The programme includes the following activities: (a) Motivating Serbian Diaspora for scientific research – financial package will include relocation expenses, costs of lab equipment, and studentships/fellowships for the any accompanying team members, and appropriate funding; (b) Setting up of a Network of Serbian Scientific Diaspora; (c) Short-term visits of eminent Serbian scientists from Diaspora to Serbia (including training, lectures. etc., in Serbian research institutions); (d) Attracting scientists from the Diaspora to launch start-up

companies will be encouraged by offering a set of special incentives, which could include tax breaks, reduction of levies and duties on their products, availability of business space at reduced rates, etc. Strategic areas to be supported through the project would include life sciences, information technology, new materials and structures.

2. The "Petnica" research centre is a unique institution with a history of 26 years and about 14,000 young trainees, many of whom are leaders of science research in Serbia today. In the next three years the work of providing additional capacities at "Petnica" should be completed with the opening of both new accommodation and modern laboratories (investment worth €7.6 million);
3. The "Mathematical" high school campus in Belgrade is a specialised secondary school which enrolls, using special selection criteria, the most talented young mathematicians and others interested in natural sciences from across Serbia. The MESTD plan calls for the building of a campus for accommodation during the school year but also for organising preparations for international scientific competitions and many other activities;
4. The new science and innovation centre in Belgrade for popularising science among young people and the public at large is one of the projects within the MESTD initiative to build a new national scientific infrastructure (investment worth €20m).

Interaction between Knowledge Triangle Policies

A crucial step forward in order to create an environment which supports technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations) are changes in HE law and innovation law to help stimulate creation of university and PROs spin-offs. The best practice case and recommended example of public-private knowledge transfer model is the (public) University of Novi Sad with more than 60 spin-off companies created within last the 5-6 years. The University of Novi Sad has established the first Intellectual Property Liaison Office in a Serbian university, in cooperation with the national Intellectual Property Office (IPO). An agreement on the support for the Intellectual Property Office to the University of Belgrade and on the foundation and objectives of the Technology Transfer Centre was signed in November 2010. The centre was established in October 26, 2010.

The innovation law supports cooperation between PROs and SMEs. The recently adopted S&T strategy and the latest public call for new R&D projects for 2011-2014 also support (and provide funding for) cooperation between PROs and SMEs.

Creation of a knowledge-based economy through the construction of S&T parks in Belgrade, Novi Sad, Niš and Kragujevac (an app. 30 million EUR investment) is one of the key elements of R&D policy for the immediate future which promotes the diversification of sources of finance for scientific projects through better cooperation with business partners.

Other Policies

There are no other policies which have explicit actions, measures and incentives on R&D activities in Serbia. This fact supports the conclusion that the innovation system governance in Serbia is still based on a linear model. Nevertheless, there are a number of initiatives launched by the MESTD in 2010 in order to motivate other ministries to support R&D activities in their future investments responsibilities. Therefore, the MESTD will support in the near future, in cooperation with other ministries, specific projects where most of the project cost will be funded out of the money for large infrastructural projects, except for specific R&D related activities and

part of researchers' salaries which would be funded by MESTD, such as: the R&D connected to the Corridor 10 infrastructure project of the Ministry for Infrastructure; Development of the academic network and Internet corridor with the Ministry of Telecommunication and Information Society, and advancement of clusters and SMEs based on innovations with the Ministry of Economy and regional development; Active participation in the national program "Serbia against cancer" and the future program "Serbia against cardio vascular diseases" with the Ministry of health, infrastructural and development programs with the Ministry of defence and the interior, and continuation of the National program for energy efficiency with the Ministry of energy; There are also plans to support new capital, infrastructural and development programs in the forthcoming massive investments in energy generation, continuation of the National program of water management with the Ministry of agriculture - Waters directorate, and other infrastructural projects with the Ministry of agriculture, preparations of Serbia for post-Kyoto world.

The legal framework for the protection of intellectual property rights in Serbia is complete and fully in accordance with international recommendations and practice. The Republic of Serbia has become the member of the European Patent Organization (EPO) on October 1, 2010.

In the following table 3 an assessment of the effectiveness of the specific policies to address the structural challenges in Serbia are presented.

Table 3

Challenges	Policy measures/actions addressing the challenge ¹⁰	Assessment in terms of appropriateness, efficiency and effectiveness
1. <i>Challenge 1.</i> The absence of coordinated governance and funding of national innovation system in Serbia between main ministries (MES, MFE) and public funding sources	Possible solution could be mutual participation of representatives from both ministries and NARD in policy related bodies (councils, committees, etc.) in order to harmonise both measures and finance addressed to same clients / users of public budget	The absence of a formal innovation policy leads to a situation, in which the governance of innovation activities in Serbia is not structured, organised and budgeted within responsible ministries
2. <i>Challenge 2.</i> The linear model of governance of the R&D and innovation system in the country	The creation of the National Strategy for science, education, research and innovation is a crucial step for developing a National Innovation System	Still present linear model of governance of the R&D and innovation system in the country is main obstacle for networking of R&D sector with the rest of economy and society
3. <i>Challenge 3.</i> The brain-drain - ongoing drain of highly educated individuals from the country	MESTD has launched in 2011 a special programme for the development of human capital in Serbia with four main lines of investment in the period 2010-2015	According to MESTD (SSTDRS, 2010), one of the significant problems in preserving and strengthening the scientific community is the ongoing drain of highly educated individuals from the country. MESTD just launched the project which will engage Serbian Diaspora in joint projects, to transfer their knowledge and skills for the benefit of Serbian society, as well as to motivate the scientists to return to Serbia
4. <i>Challenge 4.</i> The present structure and capacities of public R&D system	Restructuring of public R&D system and integration of business enterprise R&D sector into national innovation system is the strategic orientation of government as articulated in a "Strategy of	New Innovation law is the legal framework for public – private partnership in R&D and innovation, and "Strategy of Scientific and Technological Development of the Republic of Serbia 2010-2015" presents an action plan for realisation of such

¹⁰ Changes in the legislation and other initiatives not necessarily related with funding are also included.

Challenges	Policy measures/actions addressing the challenge ¹⁰	Assessment in terms of appropriateness, efficiency and effectiveness
	Scientific and Technological Development of the Republic of Serbia 2010-2015" (SSTRS, 2010)	partnership
5. <i>Challenge 5.</i> Undeveloped infrastructure for innovative entrepreneurship and lack of culture for technological entrepreneurship in HES and PROs	Crucial step forward in order to create environment which support technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations) are changes in HE Law and Innovation Law which stimulates and legally approves creation of university and PROs spin-offs.	The concept, purpose and functioning of innovation is not sufficiently developed and accepted in the economy and the society. Therefore, the development of the national innovation system in Serbia is currently in a phase of conceptualisation and far from being operational and functional. Certain number of mechanisms, grant schemes, incentives and programmes has launched since 2005, supporting public-private sectors knowledge transfer, transfer of technologies from R&D to business sector, and realisation of innovation projects in business enterprise sector in Serbia.
6. <i>Challenge 6.</i> Absence of evaluation culture and practice in R&D and innovation system in Serbia	There are no evaluation standards as well as institutions responsible for evaluation in the area of science, technology and innovation in Serbia. Only ex-ante evaluations of innovation projects proposed under public calls for funding from the MES, MFE and NARD are regularly organised. Further monitoring of on-going activities, ex post and impact evaluation of innovation activities are organised as sporadic initiatives within EU sponsored projects. It is necessary to organise national programme for evaluation of innovation activities which are (co)financed from the public sources, with development of evaluation standards, identification and training of evaluators, establishment of legal framework for such activities, etc.	The very first assessment of innovation and competitiveness support programmes in Serbia is ongoing activity within "The Improved SME Competitiveness and Innovation Project" (ICIP) (CRIS No: 2010/234-669), financed by the EU with aims at improving the competitiveness of Serbian SMEs and increasing levels of innovation in SMEs. To support these aims ICIP has undertaken an in-depth analysis of innovation and competitiveness support programmes in Serbia to raise awareness for strong policy coordination among main stakeholders to further adapt the support tools in accordance with needs of enterprises and innovation service providers. In total, nine SME innovation and competitiveness support programmes have been evaluated that are implemented by the Government of Serbia and managed by the MFE, the MES, and the NARD. The results of this assessment have been released by the end of September 2011.
7. <i>Challenge 7.</i> Insufficient knowledge about R&D and innovation capacities in business sector	The Action plan for realisation of the "Strategy of Scientific and Technological Development of the Republic of Serbia 2010-2015" should consider investigations in revealing of real situation in R&D and Innovation investments in BES in Serbia.	A crucial challenge for research governance in Serbia is the question how to increase R&D and Innovation activities in Business Enterprise Sector (BES). Official figures showed that BERD share in the GERD was only 14.32% in 2009, compared to 62% in the EU. Unofficial R&D and innovation surveys in 2010 support findings with a different situation in BES, i.e. investments in R&D and Innovation in this sector are comparable to those by the MESTD. Further investigations in revealing of real situation in R&D and Innovation investments in BES in Serbia are needed. Policy instruments for knowledge circulation promotion could have limited effects for knowledge circulation because of insufficient integration of business sector

Challenges	Policy measures/actions addressing the challenge ¹⁰	Assessment in terms of appropriateness, efficiency and effectiveness
8. <i>Challenge 8.</i> Lack of demand-side R&D and innovation policy tools and measures	Possible solution is development of integral innovation strategy and policy with appropriate action plan which will stress demand-side as well as supply side innovation policy tools and measures	and public R&D sector Key barriers in implementing demand-side policies in Serbia, besides the absence of an innovation policy are: (1) (traditional) separation between R&D sector and business sector; (2) legal obstacles (the rules defined in the Innovation law in sense of obligation for companies to be registered in the MESTD innovation register); (3) lack of public awareness of the need for such policies. Still, there are no national guidelines issued in any fields of demand-side innovation policy, neither indicators defined to capture the impact of demand-side innovation policies, nor specific national studies conducted in the topic of demand-side innovation policy issues.

4 NATIONAL PROGRESS IN INNOVATION UNION KEY POLICY ACTIONS

4.1 Strengthening the knowledge base and reducing fragmentation

Promoting excellence in education and skills development

The number of researchers in Serbia is changing from year to year, due to permanent brain drain and the effect of incentives aimed at fighting emigration of researchers from Serbia abroad. R&D personnel of 19341 employed in this sector made up 1.11% of the employment in Serbia in 2011, which is almost half of EU average of 1.673% (according to EUROSTAT data for EU28 in year 2009 as latest available). Overall, the gender structure of employment in R&D sector is balanced, with 49.35% of women researchers in 2011, although women in business (31.52%) and high education sector (47.78%) are less present in comparison with gender structure of researchers in government laboratories and institutes (55.86%). Ageing of the research population could become an issue with more than half of researchers being aged between 35 and 54 years (56.01%). According to the data of the Republic Statistics Office, in 2011 Serbia had 13,609 researchers in total, 11,615 of which were engaged in MES projects. The average age of the researchers was 44.3 years, which is above the average age of the population in the country, pointing to the need for taking action to provide for and nurture young researchers (the average age of the whole population according to census in 2011 is 41.4 (in 2002 was 40.25), classifying Serbia among the countries with an older populations).

The number of graduates in science and technology per 1 000 persons aged 20-29 years was 4.87 in 2010.

According to official R&D statistics, the distribution of researchers is as follows: 21.52% are in GS, 1.21% in BES, and 77.20% in HES sector and 0.07% in PNP sector in Serbia (head count, year 2011). There is no official statistics which can indicate the share of permanent positions in HES and PROs occupied by foreigners.

The economic and financial crisis caused budgetary restrictions in the budget allocations for R&D and Innovation projects (co)financed by the MESTD in real terms: there are no planned increases for support of R&D and innovation activities in the country. One among the key goals of the new Strategy in the period 2011-2015 is: "A realistic plan of growth of budget appropriations for science is an annual growth rate of 0.15% GDP. At such a pace, the budget appropriations by 2015, the closing of this Strategy framework shall reach 1.05%" (SSTDRS, 2010). Due to economic and financial crisis, budget for 2011 remain almost the same as it was in 2010, but already contracted obligations for new selected and approved R&D projects (BR, TD, and IIR programmes) in 2011 were much higher than in 2010; therefore, the MESTD has prolonged public call for new innovation projects from 2011 to 2012. In addition, process of selection of new innovation projects for (co)financing by the MESTD is prolonged and still not finished (situation as of September 2012), therefore financing will be partly transferred to budget for 2013.

Allocation of national funding for R&D projects goes through international evaluation procedures, as combination of domestic and foreign peer review. Monitoring of on-going R&D activities, as well as ex-post and impact evaluations of R&D activities (co)funded by the MSTD,

are still in conceptual phase, not implemented as regular practice. Last call for proposals of national R&D projects, launched in 2010, encourage engagement of young researchers and Serbian scientific Diaspora. Trans-national cooperation in R&D is encouraged through financial support of domestic institutions and individuals engaged in international calls for funding of R&D activities launched through multilateral cooperation agreements, such as EU FP7, COST, EUREKA etc. as well as under bilateral cooperation agreements with a number of countries.

Social security, pension, health and other taxes in the R&D sector are regulated within laws which regulate such rights and obligations for public services in Serbia.

There are no specific regulations to facilitate the integration of foreign researchers in the national research labour market, such as social security access, health insurance, compatibility of pension schemes in Serbia. Also, there are no tax incentives to facilitate the participation in supplementary pension schemes. Considering the researchers' status, their contracts/fellowships are subject to social and health taxes as all other business contracts in Serbia. There are no specific regulations for EU citizens/ researchers to be distinguished from the rest of the world.

MESTD launched in 2010 a public call for funding of R&D programmes in the period 2011-2014 which was explicitly open to foreign researchers (Act, 2010): "A foreign researcher who within the last five years accomplished the results that met the minimal conditions for the management of projects can be engaged in the Ministry's project. The foreign researcher engaged in the project of the Ministry is entitled to travel expenses and residence in Serbia in line with the respective act of the Ministry (Article 7)"; and "A project involving at least one foreign researcher is awarded one point additionally, and if involving 2 and more foreign researchers, it is awarded 2 points in the total sum of 50 points (Article 17)". Integration of foreign researchers into domestic R&D teams is very welcome and will be awarded in the selection procedure!

Practically, researchers and scientists in government laboratories and institutes are treated as civil servants, whose positions and a significant share (or the total amount) of income is regulated by the Science Law. Nationality of researchers and scientists is not mentioned at all within the Science Law. The same holds for recruitment and competition procedures for all applicants for permanent positions in public universities and public research institutes. Still, changes in the High Education Law are necessary, concerning process of validation of diplomas granted abroad, as well as changes in the Science Law which will introduce procedures for recognition of academic qualifications granted abroad.

Serbia is in a position to create an environment attractive enough to preserve its own human resources in R&D sector, and attract Serbian scientific Diaspora to cooperate with domestic teams and institutions. Therefore, international advertising of research vacancies supported by public funds is not and will not be an issue, at least not in near future. A more serious issue for R&D sector in Serbia is internal mobility, i.e. transfer of researchers who are awarded a national research grant to another national institution, and emigration from Serbia to a foreign institution. The first case could be solved under agreement which should be achieved between both R&D organisation and MESTD as financing and governing body. The second situation, i.e. emigration, will immediately cause cancellation of funding and, eventually, cancellation of R&D activity granted by the MESTD.

Policy framework for the implementation of the HR Strategy for Researchers in Serbia is defined in the new "Strategy of S&T Development of the Republic of Serbia 2010-2015" (SSTDRS, 2010) with legal bases in the Science law (Science Law, 2010). Operational realisation of this framework is the Serbian EURAXESS services network as part of pan-European initiative which offers personalised assistance to foreign researchers in Serbia. Serbian EURAXESS services network is the portal which provides free and personalised assistance on the challenges faced by researchers and their families when relocating, as stated in The EURAXESS Services

Commitment: for Serbian researchers planning to develop career in the heart of ERA, or researchers from EU, eager of doing research in Serbia. Work permits are required for foreigners employed in Serbia and are issued with a validity of 3 to 12 months. An application for a work permit is submitted in person or by mail to the Labour market office in Belgrade. The average time for obtaining the work permit is two days. Work permit can be renewed without obstacles and the procedure is identical to the first application. Declarations of endorsement of Charter & Code are endorsed and signed in Serbia by four higher education institutions so far: University of Novi Sad (signed February 5, 2010); University of Nis (signed November 8, 2010); Belgrade "Metropolitan" University (signed April 21, 2011); Institute of field and vegetable crops (signed November 4, 2011)¹¹.

The Strategy of Development of Education in the Republic of Serbia by the year 2020 (SDERS) was recently completed by the Ministry of Education, Science and Technological Development (MESTD) and approved by the government December 26, 2012. Main parts of this strategy includes: (a) Strategy of development of the primary and secondary education; (b) Strategy of development of the high education; (c) Strategy of development of the "lifelong learning" system in the country; (d) Strategy of financing of education in the Republic of Serbia. One chapter of the SDERS is devoted to doctoral studies elaborating present situation in country and vision and policy for development of doctoral studies in Serbia up to year 2020. Main objectives of the SDERS in the area of doctoral studies are: 1. Compatibility of the HES mission (s), outputs and impacts with the needs of economic, social, cultural and other systems needs for human capital; 2. Appropriate quality standards of HES: structure, institutions, processes, inputs and outputs; 3. Strong, development oriented and productive interactions with other national systems (economy, research, public services, culture, etc); 4. Competent and cooperative part and agent in European Higher Education Area.

Research Infrastructures

The large national research and innovation infrastructure in Serbia in terms of quality was evaluated as obsolete; this is a consequence of twenty years of no investments in R&D equipment and infrastructures (SSTDERS, 2010). Lack of resources for everyday functioning leads to a situation where that equipment is not used to its full capacity, or at all in some cases. "Serbian R&D infrastructure investment initiative" is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative, and this is reaction to the assessment of the quality and functioning of the R&D infrastructure in Serbia in 2009-2010.

One of the priorities defined in new S&T Strategy in Serbia is development of supercomputing capacities and IT infrastructure. In November 2008, Serbia became member of PRACE-Partnership for Advanced Computing in Europe. By applying the concept of grid computing capable of orchestrated performance it was possible to build a special computing network – so called "NIONET" programme that would include many computers from most of the R&D organizations in Serbia. A long term NIONET programme would be strategic and enable further advancement of the computing grid for the R&D community (academic network) (SSTDERS, 2010).

"Serbian R&D infrastructure investment initiative" is a part of the new S&T Strategy in Serbia. The main sources of financing of the infrastructural projects in the next five years will be international financial institutions, and particularly the EIB, EBRD, the World Bank, Development Bank of the Council of Europe and various international donors, specifically EU

¹¹ (source: <http://ec.europa.eu/euraxess/index.cfm/rights/charterAndCode#top>).

pre-accession funds. The Project of infrastructural investments, worth €400m already started in January 2011 and will last until the end of 2015. Projects selected for this investment were those conducive to the development of priority disciplines, likely to ensure successful development and identification of scientific talent, prevent brain drain, and finally, projects which will make up for almost twenty years of scarce investment into scientific infrastructure. Main projects within the “Serbian R&D infrastructure investment initiative” are: (1) Upgrading existing capacities (app. €70m); (2) Adaptation of existing buildings and laboratories; (3) New capital equipment for research: within the procurement of new capital equipment for research; (4) Development of Excellence centre and academic research centres (app. €60m); (5) Development of ICT infrastructure (between €30m to €80m); (6) Campus for faculties of technical sciences of the University in Belgrade; (7) Infrastructure for supercomputing initiative “Blue Danube”; (8) Creation of a knowledge-based economy through the construction of S&T parks in Belgrade, Novi Sad, Niš and Kragujevac (app. €30m); (9) Basic infrastructure projects (app. €80m). Clusters are mentioned within this S&T Strategy as “form of cooperation between science-research organizations”, i.e. “all forms of vertical and horizontal linkages need be strengthened among educational, research and manufacturing organizations towards their joint R&D work” (SSTDORS, 2010), without specific programme, therefore no projects / actions related to clustering were launched since adoption of the Strategy.

All major building infrastructural projects are still in process of realisation, with S&T park in Belgrade with completed construction and tendering for tenant R&I organisations in process as most advanced one, others are either in process of building or development of feasibility studies. The procurement of new capital equipment for R&I organisations and laboratories is permanent process since 2011.

4.2 Getting good ideas to market

Improving access to finance

Since the adoption of the national R&D strategy, covering the time period 2010-2015, several changes in budgetary commitments have been introduced (SSTDORS, 2010). A new grant program for interdisciplinary and integral research has been introduced, taking up almost a third of national R&D financing addressed to realisation of the R&D and Innovation projects. The program is meant to bring together large teams from different institutions in addressing Serbia’s R&D priorities. The remainder of project financing is split almost equally between basic and applied research. A small portion of the national RDI budget (about 2%) is spent on innovation projects.

Investments in R&D and innovation in Serbia from public sources are prioritised and budgeted in the framework of multi-annual plans to ensure predictability and long term impact. Project financing based on open competition for R&D and Innovation projects is decade’s long practice in Serbia. There is no institutional, or block funding for R&D activities in Serbia. Programmes for the support of R&D and innovation activities (co)financed by the MESTD, the Ministry of Economy and Regional Development (MFE) and the National Agency for the Regional Development (NARD) are not sector-specific.

The R&D and Innovation activities in Serbia in the period 2011-2014 are structured through the following major policy measures:

1 Policy measures for R&D activities launched by the MESTD (responsible institution is the MESTD):

- “Programme supporting Basic Research for the Research Cycle 2011-2014” [“BR Programme”];
- “Programme supporting Research in the Field of Technological Development for the Research Cycle 2011-2014” [“TD Programme”];
- “Programme of Co-Funding of Integrated and Interdisciplinary Research for the Research Cycle 2011-2014” [“IIR Programme”];
- “Programme of Providing and Maintaining Scientific Research Equipment and Scientific Research Facilities for the Research Cycle 2011-2014” [“SREF Programme”].

2 Policy measures for Innovation activities:

- Programme for Supporting SMEs and Entrepreneurs to Strengthen Innovation Activities in 2011 (responsible institution is the National Agency for the Regional Development);
- The MINI GRANTS and MATCHING GRANTS Programs – Public call for the MINI GRANTS programme is launched in December 2011; Public call for the MATCHING GRANTS programme is launched in spring 2012 (responsible institution is the Innovation Fund);
- The Programme for co-financing of the Innovation projects – Public call for this programme is launched in December 2011 (responsible institution is the MESTD).

Major changes in the R&D and innovation policy mix are:

- The “IIR Programme” is a new programme for supporting the integration of basic, applied and development research as well as for fully utilising R&D resources of the country, emphasising commercialisation of R&D activities and results;
- The “SREF Programme” is a new programme for improving the material base of basic, applied and development research as well as for fully utilising R&D equipment and infrastructure in the country;
- The MINI GRANTS Programme launched by the Innovation Fund will award selected innovation projects with substantially larger amounts of money per grant in comparison with all past and on-going innovation projects, i.e. up to €80,000. Also, the MINI GRANTS Programme overcomes the legal obstacle that resulted from the rules defined in the innovation law. This implies, in particular, the obligation for companies to be registered in the MESTD innovation register in order to be eligible for the competition under public calls launched by the MESTD;
- The Programme for Supporting SMEs and Entrepreneurs to Strengthen Innovation Activities, launched in 2011 by the National Agency for the Regional Development, is more oriented to support non-technological innovation activities. The focus is on service and organisational innovations as well as efficient adoption of quality standards.

Actual allocations for innovation projects realised by the MESTD in previous period are the following:

- November 2008 - November 2009: €3.5m;
- April 2010 - April 2011: €1.2m;
- June 2012 - June 2013: €1.7m.

There is a gap between April 2011 and June 2012: the economic and financial crisis caused budgetary restrictions in the budget allocations for R&D and Innovation projects (co)financed by the MESTD in real terms: figure for 2011 remain almost the same as it was in 2010, but already contracted obligations for new selected and approved R&D projects (BR, TD, and IIR programmes) in 2011 were much higher than in 2010; therefore, the MESTD has prolonged public call for new innovation projects from 2011 to 2012.

Public funding of R&D and Innovation activities in the period 2011-2015 should be realized under the S&T strategy assumption that: "A realistic plan of growth of budget appropriations for science is an annual growth rate of 0.15% GDP. At such a pace, the budget appropriations by 2015, the closing of this Strategy framework shall reach 1.05%" (SSTDRS, 2010).

Despite the economic crisis, the overall public R&D expenditure in Serbia has been increasing over the past years. The biggest jump was seen in 2011 when the budgetary allocations increased by 22% in comparison with 2010, following the government obligations which are result of the additional financing for research infrastructure through financial agreements with the European Investment Bank and the Council of Europe Development Bank with a total value of €305m to be implemented in 2010-2015. App. €100m has been invested in research infrastructure as part of this arrangement in the year 2011. Finally, innovation financing has been supported through an €8.4m IPA project.

Funding from abroad, particularly from the EU (via Framework), or from other international sources became an important source of R&D funding in Serbia since 2006. The share of funding from abroad increased from only 2.64% in 2006 to 7.18% in 2009 because of the increase of success in competition for FP7 and other EU funds. Figures for 2010 are consequence of global financial crisis which affect Serbian economy and R&D system as well.

There was no significant funding for innovation activities in Serbia from any source other than MESTD, MFE and NARD. A significant change in that sense happened in 2011: financial scheme for financing of the Innovation fund activities is under negotiation with the World Bank, the European Investment Bank, and the European Commission; preliminary negotiable is total sum of €75.5m for the period 2011-2014. Initial funding for the Innovation fund is provided by the "Innovation Serbia Project": The €8.4m project (Component 2: "Support Human Capital Development and Research") is funded by the EU pre-accession funds (IPA) allocated for Serbia in 2011, and implemented through the World Bank. The IPA project will provide funding for capacity building of the Innovation Fund and implementation of financial instruments supporting enterprise innovation (MINI GRANTS and MATCHING GRANTS Programs) by the Innovation Fund. The first public call for MINI GRANTS programme has been launched in December 5th, 2011. The first public call for the MATCHING GRANTS programme is launched in spring 2012. The Mini Grants Program provides unconditional grants up to €80,000 to innovative start-ups with a mandatory 15% of co-financing from the company. The Matching Grants Program is a conditional grant with a 5% royalty component, with project of up to €300,000 and a mandatory 30% co-financing from the company. Both programs have been developed with international advisors and according to World Bank international best practices. The Innovation Fund's Investment Committee awarded on June 28, 2013 EUR 2.1 million for Mini and Matching grants to 18 Serbian enterprises selected from a total of 125 applications submitted in response to the third call for proposals that ended on April 15, 2013. The Innovation Fund is implementing both programs within the Innovation Serbia Project, which is financed through a EUR 8.4 million donation from EU's Instrument for Pre-Accession (IPA) and administered by the World Bank. Up to September 2013, Innovation Fund has awarded over EUR 4.7 million to 41 projects selected from more than 300 applications. The Innovation Fund continues to encourage collaboration between the private sector and academia in

commercialization and R&D. Over 40% Mini Grant and 33% Matching Grant applications involve academic collaboration.

Eligible entities which could apply, under equal conditions, to the open competition for the funds from the Innovation Fund of the Republic of Serbia, designated for the realisation of projects within the MINI GRANTS Program are, as follows:

- The Applicant is a legal business unit, incorporated under Serbian Company Law (“Official Gazette no 125/2004”), registered at Serbian Business Registration Agency (SBRA) and located in Serbia;
- Applicant is a private sector, micro- or small- company;
- Applicant has been incorporated for no longer than two (2) years at the time of Application;
- The majority of Applicant ownership is Serbian.

After the Application is submitted, the Innovation Fund Program Managers will do a desk review of the eligibility and completeness of the submitted Application as well as initial due diligence and screening of the submitted documents where applicable including, but not limited to, company ownership documentation, proof of the IP- and know-how- rights, proof of the co-financing, and obligations under agreements with third parties.

The Applications will be evaluated based on the following criteria:

- Management credentials and ability of the company to deliver;
- Level and type of the co-financing;
- Innovative technology, product or service; usefulness and uniqueness of the innovation; clear IP position;
- Market potential;
- Potential for revenue/partnership with foreign corporation within two to three (2-3) years after the project start;
- Viable implementation methodology;
- Use of funds and adequacy of the project budget;
- Technology and implementation risk management.

Only Project Proposals satisfying all above mentioned criteria will be recommended for financing.

The pre-evaluation of the Applications for the MINI GRANTS Program includes a technical peer-review. Based on the results of peer-review the independent Investment Committee (IC) will pre-select Applications for financing under the IF’s MINI GRANTS Program. As a formal step in the application process, the IF Program Managers will meet with top management and with key operational- and business- executives from the Applicant companies that have been pre-selected by the IC. The IF on-site visits to the Applicants will take place during the 2 weeks after the IC pre-selection results are received by IF. Materials submitted in the Application will be discussed during the on-site visit, including but not limited to the content of the Project Proposal. Following the on-site visit, the IF Program Manager will complete the on-site visit report which will be used in the financing decision. The final decision for financing under the MINI GRANTS Program is made by the independent Investment Committee (IC) with the consent of the IF Board of Directors. The IC is responsible for selecting Awardees for financing

based on the complete Application, the result of the peer review and the results of the on-site visit. Following the decision to award financing, the Applicant will be offered to sign the Financing Agreement.

Eligible entities which could apply, under equal conditions, to the open competition for the funds from the Innovation Fund of the Republic of Serbia, designated for the realisation of projects within the MATCHING GRANTS Program are, as follows:

- The Applicant is a legal business unit, incorporated under Serbian Company Law (“Official Gazette no 125/2004”), registered at Serbian Business Registration Agency (SBRA) and located in Serbia;
- Applicant is a private sector, micro- or small- company.

After the Application is submitted, the Innovation Fund Program Managers will do a desk review of the eligibility and completeness of the submitted Application as well as initial due diligence and screening of the submitted documents where applicable including, but not limited to, company ownership documentation, proof of the IP- and know-how- rights, proof of the co-financing, and obligations under agreements with third parties.

The Applications will be evaluated based on the following criteria:

- Management and key personnel credentials and ability of the company to deliver;
- Level and type of the co-financing;
- Innovative technology, product or service; clear IP position and potential;
- Clear market need, competitive (preferably global) position and commercialization potential;
- Potential for revenue within two to three (2-3) years after the project start;
- Viable implementation methodology and capabilities;
- Technology and implementation risk management.

Only Project Proposals satisfying all above mentioned criteria will be recommended for financing.

The pre-evaluation of the Applications for the MATCHING GRANTS Program includes technical peer-review by independent international reviewers. Based on the results of the peer-review the IF’s independent Investment Committee will pre-select Applications for further consideration for financing under the IF’s MATCHING GRANTS Program. As a formal step in the application process, the IF Program Managers will meet with top management and key operational- and business- executives from the Applicant companies that have been pre-selected by the IF’s independent Investment Committee. The Applicant shall, upon the IF’s request, take all measures to enable the representatives of the IF to visit any part of the company’s premises for the purposes related to the Application. The IF on-site visits to the Applicants will take place within approximately two (2) weeks after the IC pre-selection results are received by the IF. Materials submitted in the Application will be discussed during the on-site visit, including but not limited to the content of the Project Proposal. Following the on-site visit, the IF Program Manager will complete the on-site visit report which will be used by IF’s independent Investment Committee along with other information in the financing decision. The final decision for financing under the MATCHING GRANTS Program is made by the IF’s independent Investment Committee with the consent of the IF Board of Directors¹¹. The IF’s independent Investment Committee is responsible for selecting Awardees for financing based on the complete Application, the result of the peer review and the results of the IF onsite visit.

Following the decision to award financing, the Applicant will be offered to sign the Financing Agreement.

The only tax incentive related to R&D and innovation activities in Serbia is addressed to organisations registered for R&D activities as non-profit organisations. These organisations are not obliged to pay taxes for R&D services they provide to clients under non-profit contracts.

Legal framework for risk and venture capital investments in R&D and innovation activities is not transparent enough and fully adapted to the “rules of game” in market economy: practically, there is no law which regulates venture capital and other risk investments.

Protect and enhance the value of intellectual property and boosting creativity

The MESTD has implemented the “Law on innovative activities” and “Law on intellectual property rights (IPR)” in order to create a mechanism for more intensive linkage of science, research and innovation with the wider economy. The laws stipulate among other things: Strategic changes of the method of funding, partly oriented to the entities in the economic sector as the proponents of innovation projects; Regulation of IPR protection, under the joint projects between the corporate sector and R&D organisations; Formation of joint investment funds for financing the innovation projects. Through the future action plan under this strategy and in cooperation with the Ministry of Finance and Economy, taxation and budgetary incentives for investment into science and research shall be pursued. The proposals of the MESTD are as follows: The investment by corporations into projects involving science research organisations, which are co-financed by MESTD shall be free of corporate profit tax (recognised as a cost); Employment of young researchers registered in the projects of MESTD in the private sector enables the private sector to give salaries for two years free of contributions and taxes (payable by the employer); Should an enterprise choose to fund an employee’s doctoral studies MESTD would bear up to one half of the costs; Young researchers registered by the MESTD, who would incorporate their own enterprise, would be exempt from paying income and profit tax up to the age of 30. After that, they will be transitioned to standard progressive taxation within 5 years; MESTD would cover the costs of patent applications and other forms of protection of intellectual property for projects co-financed by MESTD (SSTDRS, 2010).

A crucial step forward in order to create an environment which supports technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations) are changes in HE law and innovation law to help stimulate creation of university and PROs spin-offs. The best practice case and recommended example of public-private knowledge transfer model is the (public) University of Novi Sad with more than 60 spin-off companies created within last the 5-6 years. The University of Novi Sad has established the first Intellectual Property Liaison Office in a Serbian university, in cooperation with the national Intellectual Property Office (IPO). An agreement on the support for the Intellectual Property Office to the University of Belgrade and on the foundation and objectives of the Technology Transfer Centre was signed in November 2010. The centre was established in October 26, 2010.

Public procurement

The new Serbian Law on Public Procurement came into effect on 1 April 2013, replacing the former legislation enacted in 2008. The legislative overhaul is part of the wider fight against corruption and strengthening of state finances, acknowledging that the added costs of non-competitive tenders may run to hundreds of millions of Euro. Efficiency, cost-effectiveness, competition, transparency, equality and environmental protection are the stated principles that should govern all public procurement procedures. The law introduces some new measures, such

as the monitoring of public procurement over RSD 1 billion dinars (ca. 8,950,000 Euro) by “civil supervisors”, who are either experts in the domain of public procurement or associations dealing with the prevention of corruption or conflicts of interests. The law also sets out in detail the rules for public procurement of standardized goods and services (done solely by electronic means using the open procedure), as well as for electronic auctions. It also introduces a “competitive dialogue” procedure, applicable in cases where the subject matter of the procurement is of such complexity (e.g. in light of its technical specifications or legal or economic structure) that the contract cannot be awarded through regular procedures. The new legislation includes refinements of the many requirements applying at various stages of the public procurement procedure: notice, invitation and publication, tender documents, public procurement value, technical specifications, eligibility criteria, bidding process and awarding of contracts. Domestic bidders are still advantaged over foreign bidders, as are goods of domestic origin, subject however to the provisions of the Central Europe Free Trade Agreement and the Stabilization and Association Agreement (for EU bidders).

Major implementation of public procurement in the area of science, technology and innovation is in the area of R&D infrastructure. Through investment in science infrastructure, as part of a EUR400-million programme financed by the European Investment Bank and the Council of Europe Development Bank, approximately 20 different projects are envisaged, from the construction of facilities for different purposes, the purchase of equipment and the formation of a unique database of scientific equipment to the formation of a consumables request and procurement system for the entire scientific community in the period 2011-2014. A large science equipment procurement project is ongoing and it is planned to be completed by the end of the year 2013. Through this project 98 pieces of equipment worth more than EUR100,000 and over 300 items of equipment worth between EUR30 and 100 thousand are being procured, while a system for recording and cataloguing equipment has been created in the meantime. This system will make equipment available for reservation through a unique database visible on the Internet.

The project to create a centralised system for requesting and procuring consumables has been completed and through it another tender for the procurement of consumables for the entire science community is already being conducted. In the first tender in 2012 over 34,000 different articles were bought through 196 lots, and the procedure is repeated approximately every three months. The principle is that the consumables request database constantly collects purchase requests and procurement is carried out four times a year.

4.3 Working in partnership to address societal challenges

The main socio-economic challenges reflect the wider economic situation in the society¹². Primarily, these relate to the:

General economic situation in the country:

- Serbia is a country in transition with a gross domestic product that is limiting the funding available for research. The salaries of researchers and available research facilities are not adequate to attract a sufficient number of talented individuals, especially those that have received excellent education internationally. A number of researchers take on additional jobs (as professors, consultants, etc.) for financial reasons; further limiting the time they are devoting to research.

¹² [source: “National background report on Social Sciences and Humanities for Serbia”, WBC-INCO.NET project.

Education:

- The reform of education, especially higher education in Serbia is slow, due to resistance to change by many of the present staff. As a consequence, the researchers do not always have adequate training.
- Many Serbian researchers do not speak foreign languages that would enable them to perform wider primary research or secondary source research;
- Recognition of diplomas is required from scientists returning/coming from abroad and this is a complex and costly process that further prevents attraction of talented researchers.

Research System:

- The projects proposed for financing in the area of SSH are mostly very wide and research teams rarely work as a team but usually propose an umbrella project that allows everyone in the team to continue their individual research;
- Projects financed by the government in SSH have no or extremely weak link with the relevant government institutions that could potentially benefit from the research;
- Although there are institutional incentives, as MESTD support integration of Serbian scientists from Diaspora, R&D system in SSH is not willing to be open in appropriate way to researchers who would return/come from abroad;
- There is a strong problem with ethics related to proper citing;
- There is certain discrimination with regards to private research institutions. For instance, private universities that succeeded in obtaining funding for research projects are not allowed to use the government-funded electronic library access.
- Intellectual capacities of researchers are not adequately used, as in many cases; they lack funds for international cooperation (including attending conferences, translations and proof reading, etc.);
- There is not enough cooperation with Serbian scientists working abroad;
- There is not enough support for the institutional participation in international research projects, as their prerequisite frequently includes a certain amount of local participation (normally 10 per cent) – which is usually impossible to obtain;
- The infrastructure is mostly out of date;
- The community is small, and the problem is lack of independent reviewers – both for specific projects, and also of peer reviewers for the academic journals.

The main issue in all media in the country, particularly before and after elections in 2012 is so-called "war against corruption". Numbers of suspicious privatisations are under criminal investigation and these processes have resulted with strong public support for government actions as well as with proposals for changes in laws and creation of strategic documents in this area.

Brain-drain is another issue of strong interest of the civil society organisations as well as of researchers.

4.4 Maximising social and territorial cohesion

As already mentioned, the smart specialisation approach has not been adopted yet in the design of strategic policy documents in Serbia. The current approach in strategy and policy making process is traditionally based on expert opinion, without intersectoral dialogue, communication with wide public community for identification of bottom-up initiatives and priorities, scenario development, forecasting, and other future-oriented activities, which are commonly collected under foresight exercise umbrella. Because of fact that RIS3 will very likely be legal ex-ante conditionality within accession negotiations between Serbia and EU, concrete government action toward regionalisation of the governance in the area of R&D followed with smart specialisation approach in strategy building could be launched in the next period, perhaps in 2014-2015.

National priorities in the domain of S&T, defined in the “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDRS, 2010) are: (1) Biomedicine and human health; (2) New materials and nanosciences; (3) Environment protection and countering climate change; (4) Agriculture and food; (5) Energy and energy efficiency; (6) ICT; and (7) Improvement of decision making processes and affirmation of national identity.

4.5 International Scientific Cooperation

Serbia has agreement and programme of bilateral cooperation in the area of Science and Technology with France, Italy, China, Slovenia, Slovakia, Germany, Portugal, Spain, Hungary, Croatia, and Belorussia. There is no such agreement between Serbia and US so far. The transatlantic mobility is only one-direction as brain-drain of scientists from Serbia to US.

New public calls for bilateral S&T cooperation between Serbia and China, Italy, Slovenia and Slovakia have been announced in first part of the 2013 for financing R&D projects and exchange of scientist in period 2013-2015.

Bilateral programme of cooperation in the area of Science and Technology in period 2013-2015 between Serbia and Italy has been signed on July 09, 2013. Within the programme will be financed R&D projects in the following areas: biomedicine, biotechnology, agriculture and food processing technologies, energy technologies, environment, mathematics, physics, chemistry and biology, nanotechnologies and new materials, information and communication technologies and applied technologies for protection of cultural heritage. In 2013 has been selected 15 out of 77 project application for financing and realisation up to the end of 2013.

Results of selection of bilateral R&D projects within bilateral programme of cooperation in the area of Science and Technology in period 2013-2014 between Serbia and China have been announced on June 25, 2013 and 15 out of 29 project applications will be granted for financing in period July 1, 2013 – July 1, 2015.

UNESCO's Director-General and Serbian Minister of Education, Science and Technological Development, signed on April 24th 2013, in Paris, an agreement on founding a UNESCO Centre for Water, Sustainable Development and Climate Change within the Belgrade based “Jaroslav Černi” Institute for Development of Water Resources. The "Water for Sustainable Development and Adaptation to Climate Change" Centre, which will operate within the "Jaroslav Černi" Institute for Water Management, will play an important role in South-eastern Europe. The Centre will promote expert cooperation and exchange of information between different organisations involved in sustainable water resources management. The Centre will perform these activities as a part of the relevant on-going UNESCO initiatives, particularly the International Hydrological Programme - IHP.

5 NATIONAL PROGRESS TOWARDS REALISATION OF ERA

5.1 More effective national research systems

Overview of initiative(s) related to ERA priority 1:

Investments in R&D and innovation in Serbia from public sources are prioritised and budgeted in the framework of multi-annual plans. Project financing is based on open competition for R&D and Innovation projects. There is no institutional, or block funding for R&D activities in Serbia. Programmes for the support of R&D and innovation activities (co)financed by the Ministry of Education, Science and Technological Development (MESTD), the Ministry of Finance and Economy (MFE) and the National Agency for the Regional Development (NARD) are not sector-specific.

The goal of current research policy is to reach 1% of GDP for science by 2015, not counting infrastructure investments.

The main policy document addressing cooperation between universities, research and business is the new “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDRS, 2010).

The Science law (Science Law, 2010) and the Innovation law (Innovation Law, 2010) with supporting by-laws and two other policy documents (“Act on the selection, evaluation and financing of research for the project cycle 2011 – 2014”, and the “Programme for the research cycle 2011-2014”; Act, 2010) are legal base for implementation of competitive funding through calls for proposals and institutional assessments as the main modes of allocating public funds to research and innovation in Serbia. Above mentioned legal documents and the SSTDRS are legal base for applicability of the core principles of international peer review as well.

5.2 Optimal transnational co-operation and competition

Overview of initiative(s) related to ERA priority 2:

There is no specific national strategy in the Republic of Serbia for international S&T cooperation; the international S&T cooperation will be implemented in-line with the new S&T Strategy and identified priorities. The international multilateral and bilateral scientific cooperation will be implemented in-line with the new national “Strategy of Scientific and Technological Development of the Republic of Serbia 2010-2015” (SSTDRS, 2010) and identified priorities.

On the basis of the Memorandum of Understanding signed by the Republic of Serbia regarding its Association with the EU FP7, Serbia obtained the status of Associated Country on June 13, 2007. That status provides an opportunity for Serbian researchers to participate in practically all priority areas, and to engage in project coordination, but also the possibility of influencing research policy through the involvement of Serbian experts in different programme committees of the FP7.

Serbian science institutions took part as coordinators in 7 out of 11 projects funded under the FP7 regional call for tenders focusing on research infrastructural enhancement, "Research Potential 3rd call" (RegPot-3), as well as participating in the realization of 3 out of 4 remaining projects; Currently, bilateral cooperation programmes are being implemented in collaboration between Serbia and a number of countries which resulted in the co-financing of R&D projects carried out by teams consisting of researchers from Serbia and from: Germany, Hungary, France,

Slovakia, Slovenia, Croatia, Switzerland. In the 2011-2013 a call for S&T cooperation was launched with number of countries (Spain, Portugal, Greece, China, India, Croatia, Switzerland, etc.), while a framework agreement was drawn up with several other countries (Austria, the Czech Republic, Portugal, Spain, Russia, USA).

“Serbian R&D infrastructure investment initiative” is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative.

The Cross-border Innovation Strategy South Hungary - Vojvodina and the Regional innovation Strategy of the Autonomous Province of Vojvodina - RIS APV for the period 2012-2020 is presented on 29 and 30 October 2013 in Novi Sad: in the second call IPA CBC Programme Hungary - Serbia, the Information Centre for Business Standardization and Certification - BSC Centre, founded by the Government of AP Vojvodina with Hungarian partner - Regional Innovation Agency realized the INTERRIS project, in which, the Cross-border Innovation Strategy South Hungary - Vojvodina and the Regional innovation Strategy of the Autonomous Province of Vojvodina - RIS APV was elaborated. At INVESTEXPO Fair, held on 29 and 30 October 2013 in Novi Sad, Regional Innovation Strategy of the AP Vojvodina for the period 2012-2020 was presented.

5.3 An open labour market for researchers

Overview of initiative(s) related to ERA priority 3:

Allocation of national funding for R&D projects goes through international evaluation procedures, as combination of domestic and foreign peer review. Monitoring of on-going R&D activities, as well as ex-post and impact evaluations of R&D activities (co)funded by the MSTD, are still in conceptual phase, not implemented as regular practice. Latest call for proposals of national R&D projects, launched in 2010, encourage engagement of young researchers and Serbian scientific Diaspora. Trans-national cooperation in R&D is encouraged through financial support of domestic institutions and individuals engaged in international calls for funding of R&D activities launched through multilateral cooperation agreements, such as EU FP7, COST, EUREKA etc. as well as under bilateral cooperation agreements with a number of countries.

There are no specific regulations to facilitate the integration of foreign researchers in the national research labour market, such as social security access, health insurance, compatibility of pension schemes in Serbia. Also, there are no tax incentives to facilitate the participation in supplementary pension schemes. Considering the researchers' status, their contracts/fellowships are subject to social and health taxes as all other business contracts in Serbia. There are no specific regulations for EU citizens/ researchers to be distinguished from the rest of the world.

MESTD launched in 2010 a public call for funding of R&D programmes in the period 2011-2014 which was explicitly open to foreign researchers (Act, 2010): “A foreign researcher who within the last five years accomplished the results that met the minimal conditions for the management of projects can be engaged in the Ministry’s project. The foreign researcher engaged in the project of the Ministry is entitled to travel expenses and residence in Serbia in line with the respective act of the Ministry (Article 7)”; and “A project involving at least one foreign researcher is awarded one point additionally, and if involving 2 and more foreign researchers, it is awarded 2 points in the total sum of 50 points (Article 17)”. Integration of foreign researchers into domestic R&D teams is very welcome and will be awarded in the selection procedure!

Serbian EURAXESS services network is the portal which provides free and personalised assistance on the challenges faced by researchers and their families when relocating, as stated in

The EURAXESS Services Commitment: for Serbian researchers planning to develop career in the heart of ERA, or researchers from EU, eager of doing research in Serbia.

5.4 Gender equality and gender mainstreaming in research

Overview of initiative(s) related to ERA priority 4

Overall, the gender structure of employment in R&D sector is balanced, with 49.35% of women researchers in 2011, although women in business (31.52%) and high education sector (47.78%) are less present in comparison with gender structure of researchers in government laboratories and institutes (55.86%) (Statistical Office of the Republic of Serbia: yearly statistical bulletin on S&T activities in Serbia, 2012).

The Republic of Serbia is a signatory of a number of important and binding international documents, which guarantee the equality of men and women and prohibit gender-based discrimination, notably the Council of Europe's Social Charter and the European Convention on Human Rights and the United Nations Convention on the Elimination of All Forms of Discrimination against Women (CEDAW).

Domestic guarantees of gender equality are the Constitution of the Republic of Serbia and relevant laws and regulations;

- Under Article 15 of the Constitution of the Republic of Serbia (adopted in 2006, November 08), the state shall guarantee equality between women and men and develop equal opportunities policies;
- The Gender Equality Law (adopted in 2009; Official Gazette of the RS, No. 104/09) binds all public authorities to actively pursue equal opportunity policies, monitor the realisation of gender equality principles and supervise the exercise of international standards and constitutionally guaranteed rights within their remits. The Law addresses gender equality in employment, health care, family relations, education, culture, sports, political and public life and judicial protection;
- The National Strategy for Improving the Position of Women and Promoting Gender Equality was adopted in February 13, 2009 ("Official Journal RS", No. 15/09). The Strategy focuses on women's participation in policy and decision-making; in the economy, education and health;

Gender-sensitive statistics moves beyond simple disaggregation and presentation of existing data by sex, and recognises the need for monitoring the different problems and challenges faced by women and men in all walks of life.

Women's Government is a non-governmental, apolitical and non-profit organization with a mission to promote expert potential of women in Serbia. The organization was formally established in January 2007, as a result of a project «Voting for Women's Government», which was implemented by the European Movement in Serbia and the daily newspaper «Blic» with OSCE support.

Participation of the under-represented sex in committees involved in recruitment/career progression and in establishing and evaluating is regulated by the Gender Equality Law (Official Gazette of the RS, No. 104/09) by the articles 21, 30, 32 and 38.

5.5 Optimal circulation, access to and transfer of scientific knowledge including via digital ERA

Overview of initiative(s) related to ERA priority 5

Legal base for access and preservation of scientific information in the Republic of Serbia is the Science Law (Science Law, 2010). The Article 10 predefined 14 programmes of general interest to the Republic with Programmes 8, 11, 12 and 13 related to the Action MS45: Programme of development of information society; Programme for the procurement of scientific and professional literature from abroad and for access to electronic scientific and professional databases; Programme for publishing of scientific publications and holding of scientific conferences; Programme for encouraging of activities of scientific, scientific and professional societies, associations and other organisations, which are in function of the improvement of scientific research work, promotion and popularisation of science and technology and concern for the preservation of scientific and technological heritage.

The main policy document in this area is the new "Strategy of S&T Development of the Republic of Serbia 2010-2015" (SSTDERS, 2010). Two among seven national priorities in the domain of S&T, defined in S&T Strategy are: ICT and Improvement of decision making processes and affirmation of national identity.

The Strategy has proposed the building of special computing network, so called "NIONET", addressed to meet among the others and the demand for: Provision of supercomputing services to clients beyond science research and academic community (corporate sector, state administration etc.); and Warehousing of data and documents for permanent archiving (with the possibility of intelligent search) for the requirements of not only PROs but state administration, Government and public institutions, public and private enterprises and other clients. The Strategy has defined implementation instruments and one among them is the *"Program of knowledge transfer, which should make possible the development and operation of centres for transfer of know-how and networking, organization of training courses for new technologies, incentives for feasibility studies of introduction in our industry (in cooperation with the Fund for research and technology, banks and the Fund for development)"* (SSTDERS, 2010: page 66).

The major source of RTD information which offers wealth of information to researchers is KoBSON (www.kobson.nb.rs) i.e. consortia of libraries in Serbia which provides on-line retrieval of articles, journals and books, both domestic and foreign. Although this service is available to researchers in Serbia only since November 2001, it is improved year by year, and makes R&D work to be based on highly relevant and up-to-date S&T information from all world relevant journals and publishers and provides access to scientific and technological information worldwide. There is general assessment in R&D community in Serbia that Kobson is successful and crucial for R&D activities in country.

Major document which regulates forms of electronic identity for researchers giving them transnational access to digital research services is the "Strategy for development of an Information Society in Serbia up to 2020" (Official Gazette of the RS, No. 51/2010). More specifically, chapter 3 regulates role of ICT's in education, science and culture (page 12): *"Up to year 2020 all institutions in the areas of education, science and culture should use broadband communications through optical fibers, and should be equipped for fast access to the Internet, available to students, professors, researchers etc."* Further, the Strategy defines academic computer network, main services and computer nodes in Serbia. Major institutional framework for further development of this network is AMRES, as academic network in the Republic of Serbia (Official Gazette of the RS, No. 28/2010). Academic Network of Serbia (AMRES) is the national research and education network of Serbia, offering modern information-communication services and Internet



connection to its users. It's considered to be the most advanced network in country, with over 150 connected institutes and more than 150.000 active users. Using the informatics and Internet infrastructure, and computer network, AMRES provides the education and research organizations and other members with access and use of the Internet and information services in the country, as well as the connection with national and international networks of such type. AMRES is a member of the following international associations: TERENA (Trans European Research and Education Network Association); CEENET (Central and Eastern European Network Association); GÉANT2 (pan-European Research and Education Network) - observer.

Annex 1. PERFORMANCE THE NATIONAL AND REGIONAL RESEARCH AND INNOVATION SYSTEM

Feature	Assessment	Latest developments
1. Importance of the research and innovation policy	<p>(+) Specific programmes are designed and devoted to major challenges in research and innovation system in country.</p> <p>(-) Policy governance in the area of research and innovation is concentrated in one ministry (MESTD-The Ministry of Education, Science and Technology Development) with minor involvement of the Ministry of Economy in the area of innovation activities. This is a consequence of the still present linear model of governance of the R&D and innovation system in the country.</p>	<p>(+)The main policy document addressing cooperation between universities, research and business is the “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDRS, 2010).</p> <p>(+)The unchanged R&D budgets are devoted to R&D on major challenges: The “IIR Programme” is a new programme for supporting the integration of basic, applied and development research as well as for fully utilising R&D resources of the country, emphasising commercialisation of R&D activities and results; The “SREF Programme” is a new programme for improving the material base of basic, applied and development research as well as for fully utilising R&D equipment and infrastructure in the country; The MINI GRANTS Programme launched by the Innovation Fund will award selected innovation projects with substantially larger amounts of money per grant in comparison with all past and on-going innovation projects, i.e. up to €80,000. Also, the MINI GRANTS Programme overcomes the legal obstacle that resulted from the rules defined in the innovation law. This implies, in particular, the obligation for companies to be registered in the MESTD innovation register in order to be eligible for the competition under public calls launched by the MESTD.</p>
2. Design and implementation of research and innovation policies	<p>(+)There is a multi-annual STI framework in place (“Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDRS, 2010). providing a long-term policy context to prioritise expenditure on STI.</p> <p>(-)One among the key challenges R&D and Innovation system in the Republic of Serbia is faced with is the creation of the evaluation standards and principles as well as instruments and mechanisms for implementation in monitoring and evaluation of innovation support measures.</p> <p>(-) The Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3) approach has not been implemented in creation of policy documents in Serbia so far.</p>	<p>(+)The Science law (Science Law, 2010) and the Innovation law (Innovation Law, 2010) with supporting by-laws and two other policy documents (“Act on the selection, evaluation and financing of research for the project cycle 2011 – 2014”, and the “Programme for the research cycle 2011-2014”; Act, 2010) are legal base for implementation of competitive funding through calls for proposals and institutional assessments as the main modes of allocating public funds to research and innovation in Serbia. Above mentioned legal documents and the SSTDRS are legal base for applicability of the core principles of international peer review as well.</p>

3. Innovation policy	<p>(-) There is no formal innovation policy in the country which should be officially approved by the central government or any ministry or parliament so far.</p> <p>(-) Lack of demand-side R&D and innovation policy tools and measures in Serbia is one of the key obstacles for development of the national innovation system.</p>	<p>(+) A crucial step forward in order to create an environment which supports technological entrepreneurship in Higher Education Sector (HES) and PROs are changes in HE Law and Innovation Law in 2010 which stimulates and legally approves creation of university and PROs spin-offs.</p> <p>(+)The innovation law (Innovation Law, 2010) supports cooperation between PROs and SMEs. The recently adopted S&T strategy and the latest public call for new R&D projects for 2011-2014 also support (and provide funding for) cooperation between PROs and SMEs.</p> <p>(+) Creation of a knowledge-based economy through the construction of S&T parks in Belgrade, Novi Sad, Niš and Kragujevac (an app. 30 million EUR investment in the period 2011-2014) is one of the key elements of R&D policy for the immediate future which promotes the diversification of sources of finance for scientific projects through better cooperation with business partners.</p>
4. Intensity and predictability of the public investment in research and innovation	<p>(+) Investments in R&D and innovation in Serbia from public sources are prioritised and budgeted in the framework of multi-annual plans to ensure predictability and long term impact. Project financing based on open competition for R&D and Innovation projects is decade's long practice in Serbia. There is no institutional, or block funding for R&D activities in Serbia.</p> <p>(+) Despite the economic crisis, the overall public R&D expenditure in Serbia has been increasing over the past years. The biggest jump was seen in 2011 when the budgetary allocations increased by 22% in comparison with 2010, following the government obligations which are result of the additional financing for research infrastructure through financial agreements with the European Investment Bank and the Council of Europe Development Bank with a total value of €305m to be implemented in 2010-2015. App. €100m has been invested in research infrastructure as part of this arrangement in the year 2011. Finally, innovation financing has been supported through an €8.4m IPA project</p>	<p>(+) Since the adoption of the national R&D strategy, covering the time period 2010-2015, several changes in budgetary commitments have been introduced (SSTDRS, 2010). A new grant program for interdisciplinary and integral research has been introduced, taking up almost a third of national R&D financing addressed to realisation of the R&D and Innovation projects. The program is meant to bring together large teams from different institutions in addressing Serbia's R&D priorities. The remainder of project financing is split almost equally between basic and applied research. A small portion of the national RDI budget (about 2%) is spent on innovation projects</p>
5. Excellence as a key criterion for research and education policy	<p>(+) Allocation of national funding for R&D projects goes through international evaluation procedures, as combination of domestic and foreign peer review.</p> <p>(+) Project financing based on open competition for R&D and Innovation</p>	<p>(+) MESTD launched in 2010 a public call for funding of R&D programmes in the period 2011-2014 which was explicitly open to foreign researchers (Act, 2010): Integration of foreign researchers into domestic R&D teams is very welcome and will be awarded in</p>

	<p>projects is decade's long practice in Serbia. There is no institutional, or block funding for R&D activities in Serbia.</p> <p>(+) Overall, the gender structure of employment in R&D sector is balanced, with 49.35% of women researchers in 2011, although women in business (31.52%) and high education sector (47.78%) are less present in comparison with gender structure of researchers in government laboratories and institutes (55.86%).</p>	<p>the selection procedure!</p> <p>(+) The Strategy of Development of Education in the Republic of Serbia by the year 2020 (SDERS) was recently completed by the MESTD and approved by the government December 26, 2012. One chapter of the SDERS is devoted to doctoral studies elaborating present situation in country and vision and policy for development of doctoral studies in Serbia up to year 2020. Main objectives of the SDERS in the area of doctoral studies are: 1. Compatibility of the HES mission (s), outputs and impacts with the needs of economic, social, cultural and other systems needs for human capital; 2. Appropriate quality standards of HES: structure, institutions, processes, inputs and outputs; 3. Strong, development oriented and productive interactions with other national systems (economy, research, public services, culture, etc); 4. Competent and cooperative part and agent in European Higher Education Area.</p> <p>(+) Serbian EURAXESS services network is the portal which provides free and personalised assistance on the challenges faced by researchers and their families when relocating, as stated in The EURAXESS Services Commitment: for Serbian researchers planning to develop career in the heart of ERA, or researchers from EU, eager of doing research in Serbia.</p> <p>(+) Declarations of endorsement of Charter & Code are endorsed and signed in Serbia by several higher education institutions until now.</p>
6. Education and training systems	<p>(+) Policies are in place to ensure a sufficient supply of (post)graduates in science, technology, engineering and mathematics and an appropriate mix of skills among the population (including through strong vocational and education and training systems) in the medium-to-longer term.</p> <p>(+) Education and training curricula focus on equipping people with the capacity to learn and to develop transversal competences such as critical thinking, problem solving, creativity, teamwork, and intercultural and communication skills.</p> <p>(-) There are no wider policy actions to address innovation skills gaps. Entrepreneurship education and training is moderately available or included in curricula.</p>	<p>(+)The Strategy of Development of Education in the Republic of Serbia by the year 2020 (SDERS) was recently completed by the MESTD)and approved by the government December 26, 2012. Main parts of this strategy includes: (a) Strategy of development of the primary and secondary education; (b) Strategy of development of the high education; (c) Strategy of development of the "lifelong learning" system in the country; (d) Strategy of financing of education in the Republic of Serbia.</p> <p>(+) MESTD has launched a special programme for the development of human capital in Serbia (app. €33m have been set aside for this task) with four main lines of investment in the period 2010-2015.</p>
7. Partnerships between higher	<p>(+) Specific programmes are designed and devoted to promote and support</p>	<p>(+)The main policy document addressing cooperation between universities, research</p>

<p>education institutes, research centres and businesses, at regional, national and international level</p>	<p>partnerships between higher education institutes, research centres and businesses, at regional, national and international level.</p>	<p>and business is the “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDRS, 2010).</p> <p>(+) A crucial step forward in order to create an environment which supports technological entrepreneurship in Higher Education Sector (HES) and PROs are changes in HE Law and Innovation Law in 2010 which stimulates and legally approves creation of university and PROs spin-offs.</p> <p>(+)The innovation law (Innovation Law, 2010) supports cooperation between PROs and SMEs. The recently adopted S&T strategy and the latest public call for new R&D projects for 2011-2014 also support (and provide funding for) cooperation between PROs and SMEs.</p>
<p>8. Framework conditions promote business investment in R&D, entrepreneurship and innovation</p>	<p>(-) The attractiveness of R&D system in Serbia for private investments in R&D is insufficient because of the present structure and capacities of public R&D system.</p> <p>(-) The legal framework is not favourable to private sector engagement in R&D and innovation activities because of the following: Legal barriers to companies to apply for public funds for R&D and innovation activities: according to Innovation law, there is formal obligation for companies to be registered in the MESTD innovation register in order to be eligible for competition under public calls for co-financing of the innovation grants; Legal framework for risk and venture capital investments in R&D and innovation activities is not transparent enough and fully adapted to the “rules of game” in market economy: practically, there is no law which regulates venture capital and other risk investments.</p> <p>(-) Undeveloped infrastructure for innovative entrepreneurship and lack of culture for technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations) is another structural challenge in Serbian R&D and innovation landscape.</p>	<p>(+) Legal barriers to companies to apply for public funds for R&D and innovation activities are partly, resolved since 2011-2012 with funding from the Innovation fund which operates under the combination of national and international laws in order to comply between foreign donors request to be opened for all innovative companies in Serbia, and avoid national Innovation law which is highly restricted in that sense.</p> <p>(+) Crucial steps forward in order to create an environment to support technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations) are the changes in HE Law and Innovation Law in 2010 which stimulates and legally approves creation of university and PROs spin-offs. There are several examples of spin-offs initiatives, such as within University of Novi Sad - Faculty of Technical Sciences and “Mihajlo Pupin” Institute in Belgrade. Two Technology Transfer Offices are established within University of Novi Sad and University of Belgrade (in 2010) so far.</p>
<p>9. Public support to research and innovation in businesses is simple, easy to access, and high quality</p>	<p>(-) The legal framework is not favourable for public support to private sector engagement in R&D and innovation activities because of the following: Legal barriers to companies to apply for public funds for R&D and innovation activities: according to Innovation law, there is formal obligation for companies to be registered in the MESTD innovation register in order to be eligible for competition under public calls for co-</p>	<p>(+) Legal barriers to companies to apply for public funds for R&D and innovation activities are partly, resolved since 2011-2012 with funding from the Innovation fund which operates under the combination of national and international laws in order to comply between foreign donors request to be opened for all innovative companies in Serbia, and avoid national Innovation law which is highly restricted in that sense.</p>

	<p>financing of the innovation grants.</p> <p>(-) Legal framework for risk and venture capital investments in R&D and innovation activities is not transparent enough and fully adapted to the “rules of game” in market economy: practically, there is no law which regulates venture capital and other risk investments.</p>	
<p>10. The public sector itself is a driver of innovation</p>	<p>(-) Important challenge is still present linear model of governance of the R&D and innovation system in Serbia; this is the main obstacle for networking of R&D sector with the rest of economy and society, i.e. R&D sector and economy in Serbia are separate and mutually independent, without needs and aspiration for cooperation.</p>	<p>(+) The MESTD has implemented the “Law on innovative activities” (Innovation Law, 2010) and “Law on intellectual property rights (IPR, 2011)” in order to create a mechanism for more intensive linkage of science, research and innovation with the wider economy. The laws stipulate among other things: Strategic changes of the method of funding, partly oriented to the entities in the economic sector as the proponents of innovation projects; Regulation of IPR protection, under the joint projects between the corporate sector and R&D organisations; Formation of joint investment funds for financing the innovation projects. Through the future action plan under this strategy and in cooperation with the Ministry of Finance and Economy, taxation and budgetary incentives for investment into science and research shall be pursued. The proposals of the MESTD are as follows: The investment by corporations into projects involving science research organisations, which are co-financed by MESTD shall be free of corporate profit tax (recognised as a cost): Employment of young researchers registered in the projects of MESTD in the private sector enables the private sector to give salaries for two years free of contributions and taxes (payable by the employer); Should an enterprise choose to fund an employee’s doctoral studies MESTD would bear up to one half of the costs; Young researchers registered by the MESTD, who would incorporate their own enterprise, would be exempt from paying income and profit tax up to the age of 30. After that, they will be transitioned to standard progressive taxation within 5 years; MESTD would cover the costs of patent applications and other forms of protection of intellectual property for projects co-financed by MESTD (SSTDRS, 2010).</p>

Annex 2. NATIONAL PROGRESS ON INNOVATION UNION COMMITMENTS

		Main changes	Brief assessment of progress / achievements
1	Member State Strategies for Researchers' Training and Employment Conditions	<p>(+) New Science Law (law, adopted in 2010): Research positions are open to all EU citizens;</p> <p>(+) New "Strategy of S&T Development of the Republic of Serbia 2010-2015" (SSTDRS, 2010): Policy framework for the implementation of the HR Strategy for Researchers in Serbia, which makes research positions open to all EU citizens. Operational realisation of this framework is the Serbian EURAXESS services network as part of pan-European initiative which offers personalised assistance to foreign researchers in Serbia. Declarations of endorsement of Charter & Code are endorsed and signed in Serbia by four higher education institutions so far: University of Novi Sad (signed February 5, 2010); University of Nis (signed November 8, 2010); Belgrade "Metropolitan" University (signed April 21, 2011); Institute of field and vegetable crops (signed November 4, 2011);</p> <p>(+) New "Act on the selection, evaluation and financing of research for the project cycle 2011 – 2014", May 03, 2010 (Act, 2010): "A foreign researcher who within the last five years accomplished the results that met the minimal conditions for the management of projects can be engaged in the Ministry's project. The foreign researcher engaged in the project of the Ministry is entitled to travel expenses and residence in Serbia in line with the respective act of the Ministry (Article 7)"; and "A project involving at least one foreign researcher is awarded one point additionally, and if involving 2 and more foreign researchers, it is awarded 2 points in the total sum of 50 points (Article 17)". Integration of foreign researchers into domestic R&D teams is very welcome and will be awarded in the selection procedure!</p>	<p>(+) the working positions are open through the new law to researchers from all EU countries</p> <p>(-) Declarations of endorsement of Charter & Code are endorsed and signed in Serbia by just few higher education institutions; there is no public incentives for formal integration of the Charter & Code into Collective labour agreements and the High Education Law</p>
4	<i>ERA Framework</i>	<i>These are covered by the ERA Communication fiche – last revised in July 2013 and to be updated as a separate deliverable by 31.01.2014</i>	
5	Priority European Research Infrastructures	<p>(+) New "Strategy of S&T Development of the Republic of Serbia 2010-2015" (SSTDRS, 2010): "Serbian R&D infrastructure investment initiative" is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative. "Serbian R&D infrastructure investment initiative" is a part of the new S&T Strategy in Serbia. The main sources of financing of the infrastructural projects in the next five years will be international financial institutions, and particularly the EIB, EBRD, the World Bank, Development Bank of the Council of Europe and various international donors, specifically</p>	<p>(+) "Serbian R&D infrastructure investment initiative" is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative.</p> <p>(+) The Project of infrastructural investments, worth €400m already started in January 2011 and will last until</p>

		<p>EU pre-accession funds. The Project of infrastructural investments, worth €400m already started in January 2011 and will last until the end of 2015. Projects selected for this investment were those conducive to the development of priority disciplines, likely to ensure successful development and identification of scientific talent, prevent brain drain, and finally, projects which will make up for almost twenty years of scarce investment into scientific infrastructure. Main projects within the “Serbian R&D infrastructure investment initiative” are: (1) Upgrading existing capacities (app. €70m); (2) Adaptation of existing buildings and laboratories; (3) New capital equipment for research: within the procurement of new capital equipment for research; (4) Development of Excellence centre and academic research centres (app. €60m); (5) Development of ICT infrastructure (between €30m to €80m); (6) Campus for faculties of technical sciences of the University in Belgrade; (7) Infrastructure for supercomputing initiative "Blue Danube"; (8) Creation of a knowledge-based economy through the construction of S&T parks in Belgrade, Novi Sad, Niš and Kragujevac (app. €30m); (9) Basic infrastructure projects (app. €80m).</p>	<p>the end of 2015. Realisation of this project is not jeopardising by the economic crisis.</p>
7	SME Involvement	<p>(+) The EEN-Serbia: the project for realisation of the activities which are obligations of the Serbia under membership agreement of the Republic of Serbia in Enterprise Europe Network is renewed in 2013, valid until the end of 2014;</p> <p>(+) Programme for Supporting SMEs and Entrepreneurs to Strengthen Innovation Activities in 2011, 2012, and 2013 (responsible institution is the National Agency for the Regional Development). The focus is on service and organisational innovations as well as efficient adoption of quality standards;</p> <p>(+) The MINI GRANTS and MATCHING GRANTS Programs – Public call for the MINI GRANTS programme is launched in December 2011; Public call for the MATCHING GRANTS programme is launched in spring 2012 (responsible institution is the Innovation Fund). The Mini Grants Program provides unconditional grants up to €80,000 to innovative start-ups with a mandatory 15% of co-financing from the SME. The Matching Grants Program is a conditional grant with a 5% royalty component, with project of up to €300,000 and a mandatory 30% co-financing from the company. Both programs have been developed with international advisors and according to World Bank international best practices;</p> <p>(+) The Programme for co-financing of the Innovation projects (responsible institution is the MESTD). This programme has been established by the MESTD as obligation defined by the Articles 36 of the Innovation Law (“Official Gazette of RS”, nos. 110/05 and 18/10). The MESTD has launched public call for innovation projects in December 2011 was an invitation for innovation projects which will be funded €1.79m from the budget allocated for the years 2012 and 2013.</p>	<p>(+) The activities of the consortia of the organisations within EEN-Serbia are addressed to SME's offering a variety of assistance to small and medium-sized enterprises and participating in the EU Competitiveness and Innovation Framework Programme</p>

11	Venture Capital Funds	(-) Legal framework for risk and venture capital investments in R&D and innovation activities is not transparent enough and fully adapted to the “rules of game” in market economy: practically, there is no law which regulates venture capital and other risk investments.	(-) There is no law which regulates venture capital and other risk investments.
13	Review of the State Aid Framework	(+) The Ministry of Economy has launched public calls for support of innovative clusters in Serbia in 2011 and 2012 as realisation of the "The Programme for support of development of the clusters in Serbia" in respective years [http://www.klasteri.mfp.gov.rs/].	(+) The policy initiatives of the Ministry of Economy addressed to support of innovation clusters are fully in line with the Community Guidelines for State Aids for R&D and Innovation in the area of innovation clusters.
14	EU Patent	(+) The legal framework for the protection of intellectual property rights in Serbia is complete and fully in accordance with international recommendations and practice. The Republic of Serbia has become the member of the European Patent Organization (EPO) on October 1, 2010.	(+) The Republic of Serbia has become the member of the European Patent Organization (EPO) on October 1, 2010
15	Screening of Regulatory Framework	(+) The amendments on the Innovation Law (the new Innovation law, adopted in 2010) are prepared for the adoption in the Parliament in June 06, 2013, following the recommendations of the Innovation Fund, in order to improve conditions for co-financing of the innovation activities in the country.	(+) The MESTD has presented immediate reaction on requests for improvements / changes in existing Innovation Law, in order to provide conditions for efficient work of Innovation Fund in the country (-) One among the key challenges R&D and Innovation system in the Republic of Serbia is faced with is the creation of the evaluation standards and principles as well as instruments and mechanisms for implementation in monitoring and evaluation of innovation support measures.
17	Public Procurement	(+) The new Serbian Law on Public Procurement came into effect on 1 April 2013, replacing the former legislation enacted in 2008. Major implementation of public procurement in the area of science, technology and innovation is in the area of R&D infrastructure. Through investment in science infrastructure, as part of a EUR400-million programme financed by the European Investment Bank and the Council of Europe Development Bank, approximately 20 different projects are envisaged, from the construction of facilities for different purposes, the purchase of equipment and the formation of a unique database of scientific equipment to the formation of a consumables request and procurement system for the entire scientific community in the period 2011-2014. A large science equipment procurement project is ongoing and it is planned to be completed by the end of the year 2013. Through this project 98 pieces of equipment worth more than EUR100,000 and over 300 items of equipment worth between EUR30 and 100 thousand are being procured, while a system for recording and cataloguing equipment	(+) The MESTD has implemented public procurement law in the area of R&D infrastructure (-) The MESTD have no programmes or initiatives to implement public procurement law for public procurement of innovative goods and services

		<p>has been created in the meantime. This system will make equipment available for reservation through a unique database visible on the Internet.</p> <p>The project to create a centralised system for requesting and procuring consumables has been completed and through it another tender for the procurement of consumables for the entire science community is already being conducted. In the first tender in 2012 over 34,000 different articles were bought through 196 lots, and the procedure is repeated approximately every three months. The principle is that the consumables request database constantly collects purchase requests and procurement is carried out four times a year.</p>	
20	Open Access	<p>(+) Legal base for access and preservation of scientific information in the Republic of Serbia is the Science Law (Science Law, 2010) which regulates the system of scientific research activities in the Republic of Serbia. The Article 10 predefined 14 programmes of general interest to the Republic with Programmes 8, 11, 12 and 13 related to the Action MS45: Programme 8: Programme of development of information society; Programme 11: Programme for the procurement of scientific and professional literature from abroad and for access to electronic scientific and professional databases; Programme 12: Programme for publishing of scientific publications and holding of scientific conferences; Programme 13: Programme for encouraging of activities of scientific, scientific and professional societies, associations and other organisations, which are in function of the improvement of scientific research work, promotion and popularisation of science and technology and concern for the preservation of scientific and technological heritage;</p> <p>(+) The "Strategy for development of an Information Society in Serbia up to 2020" (Official Gazette of the RS, No. 51/2010) is the major document which regulates harmonised access and usage policies for research and education-related public e-infrastructures and for associated digital research services enabling consortia of different types of public and private partners;</p> <p>(+) The "Strategy for development of an Information Society in Serbia up to 2020" (Official Gazette of the RS, No. 51/2010) is the major document which regulates forms of electronic identity for researchers giving them transnational access to digital research services More specifically, chapter 3 regulates role of ICT's in education, science and culture (page 12): "Up to year 2020 all institutions in the areas of education, science and culture should use broadband communications through optical fibbers, and should be equipped for fast access to the Internet, available to students, professors, researchers etc." Further, the Strategy defines academic computer network, main services and computer nodes in Serbia. Major institutional framework for further development of this network is AMRES, as academic network in the Republic of Serbia (Official Gazette of the RS, No.</p>	<p>(+) Established legal framework and appropriate ICT infrastructure for open access of results from publicly funded research</p> <p>(+) Established legal framework and appropriate ICT infrastructure for access and usage for research and education-related public e-infrastructures and for associated digital research services</p> <p>(+) Established legal framework and appropriate ICT infrastructure for giving researchers transnational access to digital research services</p> <p>(-) There is reasonable threat for reduction and possible cancelation of the access to digital research services due to reduced finance and economic crisis</p>

		28/2010).	
21	Knowledge Transfer	<p>(+) Science Law (Science Law, 2010) and Innovation law (Innovation Law, 2010) are major instruments for protection of the results of publicly funded research and innovation;</p> <p>(+) The additional legal framework for the protection of the results of publicly funded research and innovation in Serbia is Law on special authorisation for effective protection of the intellectual property rights (2009);</p> <p>(+) New “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDRS, 2010) is major policy document which provides national framework for knowledge transfer and utilisation of publicly funded research and innovation;</p> <p>(+) Newly created public funding schemes used to support the commercialisation of innovative ideas are The MINI GRANTS and MATCHING GRANTS Programs, administered by the Innovation Fund. Public call for the MINI GRANTS programme is launched in December 2011; Public call for the MATCHING GRANTS programme is launched in spring 2012. The Mini Grants Program provides grants up to €80,000 to innovative start-ups with a mandatory 15% of co-financing from the SME. The Matching Grants Program is a grant with a 5% royalty component, with project of up to €300,000 and a mandatory 30% co-financing from the company. Both programs have been developed with international advisors and according to World Bank international best practices;</p> <p>(+) Crucial steps forward in order to create environment which support technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations) are changes in the HE Law (HE Law, 2012) and Innovation Law (Innovation Law, 2010) which stimulate the legally approved creation of university and PROs spin-offs. Best practice case and recommended way public-private knowledge transfer model is (public) University of Novi Sad with more than 80 spin-off companies created within last 6-7 years. University of Novi Sad has established the first Intellectual Property Liaison Office within university, in cooperation with national Intellectual Property Office, as the first such office within HE and in overall R&D sector in Serbia. An agreement on the support for the Intellectual Property Office to the University of Belgrade and on the foundation and objectives of the Technology Transfer Centre was signed in November 2010. The centre was established by the decision of the University Council from October 26, 2010, with the purpose of identification, protection and</p>	<p>(+) Established legal framework and building of appropriate infrastructure for knowledge transfer and utilisation of results from publicly funded research;</p> <p>(-) Undeveloped patenting culture in R&D sector;</p> <p>(-) Undeveloped entrepreneurial culture in R&D sector;</p> <p>(-) Insufficient mobility of researchers from PROs to private universities or private companies.</p>

		<p>commercialization of the results of research work of professors, researchers and students, and the protection of intellectual property;</p> <p>(+) Innovation law (Innovation Law, 2010) supports cooperation between PROs and SMEs;</p> <p>(+) The recently adopted S&T Strategy (SSTDRS, 2010) and the latest public call for new R&D projects for the 2011-2014 period also support (and awards, in financial terms) cooperation between PROs and SMEs;</p> <p>(+) Creation of a knowledge-based economy through the construction of science parks in Belgrade, Novi Sad, Niš and Kragujevac (an approximately 30 million EUR investment) is one of the key elements of R&D policy for the immediate future which promotes the diversification of sources of finance for scientific projects through better cooperation with business partners. The establishment of S&T parks closely associated with universities and the rest of scientific community opens the possibility of creating more knowledge based companies. The parks will also provide infrastructure support to joint projects or scientists and interested companies;</p> <p>(+) The new law on innovation (Innovation Law, 2010) and the law on intellectual property rights (IPR) (IPR Law, 2011) have the aim of helping to focus R&D on more intensive linkage of R&D and innovation with business partners. The law will stipulate among others things strategic changes to the method of funding partly oriented to companies as the leaders of innovation projects;</p> <p>(+) The Innovation Fund (IF) is formed on a PP basis between direct and indirect beneficiaries of the budget, public and private enterprises, banks, and others. The IF mission is to enable direct financing of private companies who are capable of implementing a project for development of products, processes or services, by selecting the competent R&D organisation;</p> <p>(-) Mobility of researchers is, at present, mostly in one-direction, away from PROs to private universities or private companies because of the much higher salaries they offer. There are no official obstacles for such movement, but there is an official statement of the (public) University of Belgrade which declares any part-time engagement of their staff in private universities as not-acceptable which could cause termination of contract with University of Belgrade.</p>	
22	European Knowledge Market for Patents and Licensing	<p>(+) The legal framework for the protection of intellectual property rights in Serbia is complete and fully in accordance with international recommendations and practice (IPR Law, 2011). The Republic of Serbia has become the member of the European Patent Organization (EPO) on October 1, 2010;</p> <p>(+) The consortia of partners within EEN-Serbia, i.e.</p>	<p>(+) Established legal framework for development of the knowledge markets for patents and licensing;</p> <p>(-) Undeveloped patenting culture in Serbia.</p>

		<p>the project for realisation of the activities which are obligations of the Serbia under membership agreement of the Republic of Serbia in Enterprise Europe Network (renewed in 2013, valid until the end of 2014) is platform that match supply and demand of technologies and other sorts of IP in Serbia, and providing support (incl. provision of information through road shows, open days, exhibitions, direct support to IPR, etc.) for patenting, trademarks, copyright, design rights and their commercial exploitation;</p> <p>(+) New “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTD RS, 2010) has proposed that the MESTD should implement the “Law on innovative activities” (Innovation Law, 2010) and “Law on intellectual property rights (IPR Law, 2011)” in order to create a mechanism for more intensive linkage of science, research and innovation with the wider economy. The laws stipulate among other things: Strategic changes of the method of funding, partly oriented to the entities in the economic sector as the proponents of innovation projects; Regulation of IPR protection, under the joint projects between the corporate sector and R&D organisations; Formation of joint investment funds for financing the innovation projects. Through the future action plan under this strategy and in cooperation with the Ministry of Finance and Economy, taxation and budgetary incentives for investment into science and research shall be pursued. The proposals of the MESTD are as follows: The investment by corporations into projects involving science research organisations, which are co-financed by MESTD shall be free of corporate profit tax (recognised as a cost); Employment of young researchers registered in the projects of MESTD in the private sector enables the private sector to give salaries for two years free of contributions and taxes (payable by the employer); Should an enterprise choose to fund an employee’s doctoral studies MESTD would bear up to one half of the costs; Young researchers registered by the MESTD, who would incorporate their own enterprise, would be exempt from paying income and profit tax up to the age of 30. After that, they will be transitioned to standard progressive taxation within 5 years; MESTD would cover the costs of patent applications and other forms of protection of intellectual property for projects co-financed by MESTD (SSTD RS, 2010).</p>	
23	Safeguarding Intellectual Property Rights	<p>(+) The legal framework for the protection of intellectual property rights in Serbia is complete and fully in accordance with international recommendations and practice (IPR Law, 2011). The Republic of Serbia has become the member of the European Patent Organization (EPO) on October 1, 2010;</p> <p>(+) The additional legal framework for the protection of the results of publicly funded research and innovation in Serbia is Law on special authorisation for effective protection of the intellectual property rights</p>	<p>(+) Established legal framework for development of the knowledge markets for patents and licensing;</p> <p>(-) Undeveloped patenting culture in Serbia.</p>

		(2009).	
24	Structural Funds and Smart Specialisation	(-) The Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3) approach has not been implemented in creation of strategic policy documents in Serbia so far. The current approach in strategy and policy making process is traditionally based on expert opinion, without intersectoral dialogue, communication with wide public community for identification of bottom-up initiatives and priorities, scenario development, forecasting, and other future-oriented activities, which are commonly collected under foresight exercise umbrella.	(-) The Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3) approach has not been implemented in creation of strategic policy documents in Serbia so far.
25	Post 2013 Structural Fund Programmes	(+) Serbia is in process of preparation of the "Strategy Paper for the Republic of Serbia 2014-2020", concerning IPA 2 programme. First draft is released on July 5th, 2013.	(+) "Strategy Paper for the Republic of Serbia 2014-2020", concerning IPA 2 programme is in process of preparation.
26	European Social Innovation pilot	(+) The Social Innovation Fund in Serbia was a program of the Ministry of Labour and Social Policy during the 2000s, which is implemented in cooperation with the United Nations Development Program (UNDP) and supported by the European Union (EU), the Government of the Kingdom of Norway and the Government of Great Britain. SIF has invested 6 million EUR into development of social protection and we have supported 232 projects in local communities of Serbia. (-) Despite some fine results the Social Innovation Fund in Serbia doesn't exist anymore due to financial and political reasons.	(-) The Social Innovation Fund in Serbia doesn't exist anymore due to financial and political reasons. (-) "Social innovation is rather a new concept in Serbia, not widely understood and lacking an accepted definition. Similar to the rest of the region the country is considered to be lagging behind more developed nations regarding this field." [https://webgate.ec.europa.eu/socialinnovationeurope/social-innovation-serbia]
27	Public Sector Innovation	(+) The project Competition for Best Technology Innovation [http://www.inovacija.org/] is initiated in 2005 by the Ministry of Science and Environmental Protection of Serbia. Project Competition for Best Technology Innovation promote entrepreneurship in Serbia and give assistance to potential and existing entrepreneurs, who are willing and able to own ideas and inventions spill over into the market valuable innovations. The overall result achieved during the competition for the best technological innovation since 2005 by 2010 year are as follows: a total of 5360 competitors participated, it was held 234 trainings, 476 teams have written a business plan for setting up a business based on their inventions and 115 teams have drafted marketing plan. In the final events, total for all six years were 68 contestants, the total prize fund for them amounted to 41.88 million dinars. In addition to finalists, awards were given to semi-finalists and also there were prizes for special categories. Total award for special category was 7,385,000 dinars. Additional result of this competition is establishment of 44 new enterprises.	(+) The project the project Best Technology Competition is one of the most attractive approaches of government to promotion of innovation i Serbia. Established enterprises and provided help to entrepreneurs represent positive ex-post evaluation.
29	European Innovation	(+) Serbia is in process of negotiation of conditions for participation in Horizon 2020 programme	(+) Serbia is in process of negotiation of conditions for

	Partnerships		participation in Horizon 2020 programme
30	Integrated Policies to Attract the Best Researchers	<p>(+) According the new “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDERS, 2010), one of the significant problems in preserving and strengthening the scientific community is the ongoing drain of highly educated individuals from the country. In the period 1990-2000, about 73.000 inhabitants left Serbia, and among them 17,000 had university degrees. This emigration trend continued after 2000, with some 50,000 people leaving, of which about 2,000 were university graduated. The majority of the highly educated emigrants are from the area of engineering and technological studies and from the area of natural sciences. It is exactly for these reasons that a change has to be introduced in the High Education (HE) policies, including the introduction of initiatives aimed at keeping the best graduates and researchers in the country, along with the adoption of a long-term plan for the return of scientists from the Diaspora. MESTD just launched (in 2011) the project which will engage Serbian Diaspora in joint projects, to transfer their knowledge and skills for the benefit of Serbian society, as well as to motivate the scientists to return to Serbia.</p>	<p>(-) Serbia is faced with critical outflow of researchers from the country and/or from R&D sector;</p> <p>(+) MESTD has launched in 2011 the project which will engage Serbian Diaspora in joint projects, to transfer their knowledge and skills for the benefit of Serbian society, as well as to motivate the scientists to return to Serbia.</p>
31	Scientific Cooperation with Third Countries	<p>(+) On the basis of the Memorandum of Understanding signed by the Republic of Serbia regarding its Association with the EU FP7, Serbia obtained the status of Associated Country on June 13, 2007. That status provides an opportunity for Serbian researchers to participate in practically all priority areas, and to engage in project coordination, but also the possibility of influencing research policy through the involvement of Serbian experts in different programme committees of the FP7. The programmes through which Serbian researchers have worked and in which they are currently active are the Seventh EU Programme, as well as COST, EUREKA, NATO Science for Peace and Security, including cooperation with the International Atomic Energy Agency (IAEA), and bilateral cooperation programmes;</p> <p>(+) New S&T strategy (SSTDERS, 2010) promotes international multilateral and bilateral S&T cooperation. Currently, bilateral cooperation programmes are being implemented in collaboration between Serbia and with number of countries which has resulted in the co-financing of R&D projects carried out by teams consisting of researchers from Serbia and from: Germany (DAAD Programme), Hungary, France – two programmes: Pavle Savic / Hubert Curien partnership and cooperation with CNRS, Slovakia, Slovenia, Croatia, Switzerland (SCOPES Programme), Belarus, China, Italy. In the near future, the cooperation will be launched with Spain, Portugal, Greece (new cycle), and India, while a framework agreement was achieved with several other countries and the relevant procedures are underway (Austria, the Czech Republic, Portugal, Spain, Russia, USA).</p>	<p>(+) The impact of international multilateral and bilateral S&T cooperation on the RTD landscape could be assessed as important for the R&D sector and S&T development in Serbia.</p>
32	Global Research	<p>(+) "Serbian R&D infrastructure investment initiative" is a part of the new S&T Strategy in Serbia (SSTDERS,</p>	<p>(+) "Serbian R&D infrastructure investment</p>

	Infrastructures	2010). This is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative.	initiative" is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative.
33	National Reform Programmes	(+) The attractiveness of R&D system in Serbia for private investments in R&D is insufficient because of the present structure and capacities of public R&D system. Restructuring of public R&D system and integration of BES into national innovation system is primary task for the government (SSTDRS, 2010).	(+) Restructuring of public R&D system and integration of BES into national innovation system is part of government agenda (SSTDRS, 2010); (-) Restructuring of public R&D system is temporary postponed due to economic crisis.

Annex 3. NATIONAL PROGRESS TOWARDS REALISATION OF ERA

ERA Priority	ERA Action	Recent changes	Assessment of progress in delivering ERA
1. More effective national research systems	Action 1: Introduce or enhance competitive funding through calls for proposals and institutional assessments	The main policy document addressing Action 1 is the new “Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDERS, 2010). Investments in R&D and innovation in Serbia from public sources are prioritised and budgeted in the framework of multi-annual plans to ensure predictability and long term impact. Project financing based on open competition for R&D and Innovation projects is decade’s long practice in Serbia. There is no institutional, or block funding for R&D activities in Serbia. Programmes for the support of R&D and innovation activities (co)financed by the Ministry of Education, Science and Technological Development (MESTD), the Ministry of Economy (ME) and the National Agency for the Regional Development (NARD) are not sector-specific.	(+)There is a multi-annual STI framework in place (“Strategy of S&T Development of the Republic of Serbia 2010-2015” (SSTDERS, 2010). providing a long-term policy context to prioritise expenditure on STI and secure project financing based on open competition for R&D and Innovation projects.
	Action 2: Ensure that all public bodies responsible for allocating research funds apply the core principles of international peer review	Following the new Strategy, a public call for funding of Basic Research, Technological Development and Integrated and Interdisciplinary Research programmes has been announced on 23/05/2010 It was accompanied by the “Act on the selection, evaluation and financing of research for the project cycle 2011-2014”, and the “Programme for the research cycle 2011-2014” (Act, 2010). The latter is a measure established by the Minister following the Science Law. Legal base for Condition for applicability of the core principles of international peer review is defined by the Article 19 of this Act (Act, 2010).	(+)The Science law (Science Law, 2010) and the Innovation law (Innovation Law, 2010) with supporting by-laws and two other policy documents (“Act on the selection, evaluation and financing of research for the project cycle 2011-2014”, and the “Programme for the research cycle 2011-2014”; Act, 2010) are legal base for implementation of competitive funding through calls for proposals and institutional assessments as the main modes of allocating public funds to research and innovation in Serbia. Above mentioned legal documents and the SSTDERS are legal base for applicability of the core principles of international peer review as well.

2. Optimal transnational co-operation and competition	Action 1: Step up efforts to implement joint research agendas addressing grand challenges, sharing information about activities in agreed priority areas, ensuring that adequate national funding is committed and strategically aligned at European level in these areas	International scientific cooperation will be implemented in-line with the new S&T Strategy and its priorities (SSTDERS, 2010). International cooperation, particularly in the FP7, with the participation of the Serbian researchers is already largely in line with the priority areas defined in this strategy. In the meantime, the programmes partly financed by national funds, in these areas of cooperation will be realigned with the identified priorities.	(+) There is established legal and policy environment concerning initiatives at national level related to the Action 1.
	Action 2: Ensure mutual recognition of evaluations that conform to international peer-review standards as a basis for national funding decisions	The “Act on the selection, evaluation and financing of research for the project cycle 2011-2014”, and the “Programme for the research cycle 2011-2014” (Act, 2010) are instruments established by the Minister following the Science Law. Legal base for Condition for applicability of the core principles of international peer review is defined by the Article 19 of this Act (Act, 2010).	(+) There is established legal and policy environment concerning initiatives at national level related to the Action 2.
	Action 3: Remove legal and other barriers to the cross-border interoperability of national programmes to permit joint financing of actions including cooperation with non-EU countries where relevant	Researchers and scientists in government laboratories and institutes in Serbia are treated as civil servants, whose positions and a significant share (or the total amount) of income is regulated by the Science law. Nationality of researchers and scientists is not mentioned at all within the Science law (Science Law, 2010). The same holds for recruitment and competition procedures for all applicants for permanent positions in public universities and public research institutes. Still, there are measures which have to be taken in order to facilitate and adapt process of recognition of professional qualifications which facilitate the equivalence/validation of foreign academic degrees and hence support international applications for posts within national R&D system. These measures include changes in High Education Law, concerning process of validation of diplomas granted abroad, as well as changes in Science law which will introduce procedures for recognition of academic qualifications granted abroad.	(+) Social security, pension, health and other taxes in the R&D sector are regulated within laws which regulate such rights and obligations for public services in Serbia. (-) There are no specific regulations to facilitate or prevent the integration of foreign researchers in the national research labour market, such as social security access, health insurance, compatibility of pension schemes in Serbia. Also, there are no tax incentives to facilitate or prevent the participation in supplementary pension schemes. (+) Considering the researchers' status, their contracts/fellowships are subject to social and health taxes as all other business contracts in Serbia. There are no specific regulations for EU citizens/ researchers to be distinguished from the rest of the world.

	Action 4: Confirm financial commitments for the construction and operation of ESFRI, global, national and regional RIs of pan-European interest, particularly when developing national roadmaps and the next SF programmes	"Serbian R&D infrastructure investment initiative" is a part of the new S&T Strategy (SSTDRS, 2010) in Serbia. The main sources of financing of the infrastructural projects in the next five years will be international financial institutions, and particularly the EIB, EBRD, the World Bank, Development Bank of the Council of Europe and various international donors, specifically EU pre-accession funds. The Project of infrastructural investments, worth €400m already started in January 2011 and will last until the end of 2015. Projects selected for this investment were those conducive to the development of priority disciplines, likely to ensure successful development and identification of scientific talent, prevent brain drain, and finally, projects which will make up for almost twenty years of scarce investment into scientific infrastructure. Main projects within the "Serbian R&D infrastructure investment initiative" are: (1) Upgrading existing capacities (app. €70m); (2) Adaptation of existing buildings and laboratories; (3) New capital equipment for research: within the procurement of new capital equipment for research; (4) Development of Excellence centre and academic research centres (app. €60m); (5) Development of ICT infrastructure (between €30m to €80m); (6) Campus for faculties of technical sciences of the University in Belgrade; (7) Infrastructure for supercomputing initiative "Blue Danube"; (8) Creation of a knowledge-based economy through the construction of S&T parks in Belgrade, Novi Sad, Niš and Kragujevac (app. €30m); (9) Basic infrastructure projects (app. €80m).	(+) "Serbian R&D infrastructure investment initiative" is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative.
	Action 5: Remove legal and other barriers to cross-border access to RIs	"Serbian R&D infrastructure investment initiative" is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative.	(+) "Serbian R&D infrastructure investment initiative" is national R&D infrastructure roadmap, prepared in communication with ESFRI, following country membership status in this EU R&D infrastructure initiative.
ERA priority 3: An open labour market for researchers	Action 1: Remove legal and other barriers to the application of open, transparent and merit based	MES launched in 2010 a public call for funding of R&D programmes in the period 2011-2014 which was explicitly open to foreign researchers (Act, 2010): Article 7 and Article 17. Integration of foreign researchers into	(+) Integration of foreign researchers into domestic R&D teams is very welcome and will be awarded in the selection procedure (Act, 2010).

	recruitment of researchers	domestic R&D teams is very welcome and will be awarded in the selection procedure!	
	Action 2: Remove legal and other barriers which hamper cross-border access to and portability of national grants	Nationality of researchers and scientists is not mentioned at all within the Science Law. The same holds for recruitment and competition procedures for all applicants for permanent positions in public universities and public research institutes.	(+) Integration of foreign researchers into domestic R&D teams is very welcome and will be awarded in the selection procedure (Act, 2010). (-) Changes in the High Education Law are necessary, concerning process of validation of diplomas granted abroad, as well as changes in the Science Law which will introduce procedures for recognition of academic qualifications granted abroad.
	Action 3: Support implementation of the Declaration of Commitment to provide coordinated personalised information and services to researchers through the pan-European EURAXESS3 network	Serbian EURAXESS services network is the portal which provides free and personalised assistance on the challenges faced by researchers and their families when relocating, as stated in The EURAXESS Services Commitment: for Serbian researchers planning to develop career in the heart of ERA, or researchers from EU, eager of doing research in Serbia. Work permits are required for foreigners employed in Serbia and are issued with a validity of 3 to 12 months. An application for a work permit is submitted in person or by mail to the Labour market office in Belgrade. The average time for obtaining the work permit is two days. Work permit can be renewed without obstacles and the procedure is identical to the first application.	(+) Policy framework for the implementation of the HR Strategy for Researchers in Serbia is defined in the new "Strategy of S&T Development of the Republic of Serbia 2010-2015" (SSTDERS, 2010) with legal bases in the Science law (Science Law, 2010). (+) Serbian EURAXESS services network is the portal which provides free and personalised assistance on the challenges faced by researchers and their families when relocating, as stated in The EURAXESS Services Commitment: for Serbian researchers planning to develop career in the heart of ERA, or researchers from EU, eager of doing research in Serbia.
	Action 4: Support the setting up and running of structured innovative doctoral training programmes applying the Principles for Innovative Doctoral Training.	The Strategy of Development of Education in the Republic of Serbia by the year 2020 (SDERS) was recently completed by the MESTD and approved by the government December 26, 2012. One chapter of the SDERS is devoted to doctoral studies elaborating present situation in country and vision and policy for development of doctoral studies in Serbia up to year 2020. Main objectives of the SDERS in the area of doctoral studies are: 1. Compatibility of the HES mission (s), outputs and impacts with the needs of economic, social, cultural and other systems needs for human capital; 2. Appropriate quality standards of HES: structure, institutions,	(+) The Strategy of Development of Education in the Republic of Serbia by the year 2020 (SDERS, 2012) is legal and policy document meant to support realisation of the Action 4 among the number of other objectives.

		processes, inputs and outputs; 3. Strong, development oriented and productive interactions with other national systems (economy, research, public services, culture, etc); 4. Competent and cooperative part and agent in European Higher Education Area.	
	Action 5: Create an enabling framework for the implementation of the HR Strategy for Researchers incorporating the Charter & Code	Policy framework for the implementation of the HR Strategy for Researchers in Serbia is defined in the new "Strategy of S&T Development of the Republic of Serbia 2010-2015" (SSTD RS, 2010) with legal bases in the Science law (Science Law, 2010). Operational realisation of this framework is the Serbian EURAXESS services network as part of pan-European initiative which offers personalised assistance to foreign researchers in Serbia. Declarations of endorsement of Charter & Code are endorsed and signed in Serbia by four higher education institutions so far.	(+) Declarations of endorsement of Charter & Code are endorsed and signed in Serbia by four higher education institutions so far.
ERA priority 4: Gender equality and gender mainstreaming in research	Action 1: Create a legal and policy environment and provide incentives	Overall, the gender structure of employment in R&D sector is balanced, with 49.35% of women researchers in 2011, although women in business (31.52%) and high education sector (47.78%) are less present in comparison with gender structure of researchers in government laboratories and institutes (55.86%) (Statistical Office of the Republic of Serbia: yearly statistical bulletin on S&T activities in Serbia, 2012).	(+) Gender equality in Serbia refers to women and men having equal opportunities, rights and duties in their social, professional and family environments. There is rather comprehensive legal and policy environment concerning gender equality in Serbia.
	Action 2: Engage in partnerships with funding agencies, research organisations and universities to foster cultural and institutional change on gender	The Plan of action for the implementation of the national strategy for improving and promoting gender equality 2010-2015 (adopted by the Government of the Republic of Serbia in August 2010) is the policy environment concerning initiatives at national level related to the Action 2.	(+) There is established legal and policy environment concerning initiatives at national level related to the Action 2.
	Action 3: Ensure that at least 40% of the under-represented sex participate in committees involved in recruitment/career progression and in establishing and evaluating	Participation of the under-represented sex in committees involved in recruitment/career progression and in establishing and evaluating is regulated by the Gender Equality Law (Official Gazette of the RS, No. 104/09). According to latest gender-sensitive statistics, position of women in high education and S&T in Serbia is the following (source: "Women and Men in the Republic of Serbia", the Statistical Office of the Republic of Serbia, Belgrade, December 2011):	(+) There is established legal and policy environment concerning initiatives at national level related to the Action 3.

- Among students who graduated from high school in 2010, the most common occupational profiles for girls are grammar school, economics, law, administration and health and social care, and for boys, mechanical engineering and metal processing, electrical engineering and grammar school;
 - Not only are more women enrolled in colleges and universities (55%), but women make up a higher percentage of graduates – 61% (data from 2009);
 - Among graduates, men account for more than half in the fields of natural sciences, mathematics, computer science (61%) and technical science, manufacturing and construction (56%), while women constitute the majority of all graduates in the fields of education (as much as 91%), health and social care (77%), arts and humanities (65%), and social sciences, business and law (62%);
 - A more or less equal number of male and female students graduate in the fields of services, agriculture and veterinary medicine;
 - In 2009, the number of women and men with doctoral degrees had evened out, and women accounted for 44% of all doctoral and master's degrees and specialists among teaching personnel at universities and colleges;
 - Men use computers and the Internet more than women, even among the younger generation;
 - The activity rate for women aged 15 to 64 is 16 percentage points smaller than the activity rate of men (51% and 67%), with earlier retirement for women partly affecting this ratio;
 - The activity rate of women with vocational school or university education is higher than the activity rate of men with the same level of education (75% vs. 65%), and is almost twice the average activity rate for all women aged over 15 years, which is 39%.
- Gender statistics in decision making processes showed (data on the members of the Government and state secretaries refers to the period after the reconstruction of the Government undertaken in March 2011.) that women are:

		<ul style="list-style-type: none"> ▪ Mayors in municipalities in 8% of cases; ▪ Mayors in cities in 6% of cases; ▪ Members of National Assembly - 22%; ▪ State secretaries - 29%; ▪ Government members - 18%. 	
ERA priority 5: Optimal circulation, access to and transfer of scientific knowledge including via digital ERA	Action 1: Define and coordinate their policies on access to and preservation of scientific information	<p>Legal base for access and preservation of scientific information in the Republic of Serbia is the Science Law (Science Law, 2010) which regulates the system of scientific research activities in the Republic of Serbia. The Article 10 predefined 14 programmes of general interest to the Republic with Programmes 8, 11, 12 and 13 related to the Action 1.</p>	(+) There is established legal and policy environment concerning initiatives at national level related to the Action 1.
	Action 2: Ensure that public research contributes to Open Innovation and foster knowledge transfer between public and private sectors through national knowledge transfer strategies	<p>The main policy document related to the Action 2 is the new "Strategy of S&T Development of the Republic of Serbia 2010-2015" (SSTDRS, 2010). The Strategy has defined implementation instruments and one among them is the "Program of knowledge transfer, which should make possible the development and operation of centres for transfer of know-how and networking, organization of training courses for new technologies, incentives for feasibility studies of introduction in our industry (in cooperation with the Fund for research and technology, banks and the Fund for development)" (SSTDRS, 2010: page 66).</p> <p>In addition, the Strategy has specific objective 4.11: "Partnership with industry through an Innovation fund - For the projects directly related to product development, processes and services in priority areas and their placement to the national and international market a special Fund need to be formed for innovations development, on PP basis between direct and indirect beneficiaries of the budget, public enterprises, international financial institutions, banks, private commercial companies and others. The Fund would be established under the law governing incorporation and operation of investment funds, with majority state founding equity. A special rulebook would define the operations of the Fund, its financing, allocation of assets, procedures for selection of projects, form of contracts with the beneficiaries, etc..." (SSTDRS, 2010:</p>	(+) There is established legal and policy environment concerning initiatives at national level related to the Action 2.

		page 58).	
	Action 3: Harmonise access and usage policies for research and education-related public e-infrastructures and for associated digital research services enabling consortia of different types of public and private partners	<p>Major document which regulates harmonised access and usage policies for research and education-related public e-infrastructures and for associated digital research services enabling consortia of different types of public and private partners is the "Strategy for development of an Information Society in Serbia up to 2020" (Official Gazette of the RS, No. 51/2010).</p> <p>The major source of RTD information which offers wealth of information to researchers is KoBSON (www.kobson.nb.rs) i.e. consortia of libraries in Serbia which provides on-line retrieval of articles, journals and books, both domestic and foreign. Although this service is available to researchers in Serbia only since November 2001, it is improved year by year, and makes R&D work to be based on highly relevant and up-to-date S&T information from all world relevant journals and publishers and provides access to scientific and technological information worldwide.</p>	<p>(+) There is established legal and policy environment concerning initiatives at national level related to the Action 3.</p> <p>(+) There is general assessment in R&D community in Serbia that KoBSON is successful and crucial for R&D activities in country.</p>
	Action 4: Adopt and implement national strategies for electronic identity for researchers giving them transnational access to digital research services	<p>Major document which regulates forms of electronic identity for researchers giving them transnational access to digital research services is the "Strategy for development of an Information Society in Serbia up to 2020" (Official Gazette of the RS, No. 51/2010). More specifically, chapter 3 regulates role of ICT's in education, science and culture (page 12): "Up to year 2020 all institutions in the areas of education, science and culture should use broadband communications through optical fibers, and should be equipped for fast access to the Internet, available to students, professors, researchers etc." Further, the Strategy defines academic computer network, main services and computer nodes in Serbia. Major institutional framework for further development of this network is AMRES, as academic network in the Republic of Serbia (Official Gazette of the RS, No. 28/2010).</p>	<p>(+) There is established legal and policy environment concerning initiatives at national level related to the Action 4.</p>

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LIST OF ABBREVIATIONS

BERD	Business Expenditures for Research and Development
BR Programme	Programme supporting Basic Research for the Research Cycle 2011-2014
CERN	European Organisation for Nuclear Research
ERA	European Research Area
COST	European Cooperation in Science and Technology
ERA-NET	European Research Area Network
ERP Fund	European Recovery Programme Fund
ESA	European Space Agency
ESFRI	European Strategy Forum on Research Infrastructures
FP	European Framework Programme for Research and Technology Development
EU	European Union
EU-27	European Union including 27 Member States
FDI	Foreign Direct Investments
FP	Framework Programme
FP7	7th Framework Programme
GBAORD	Government Budget Appropriations or Outlays on R&D
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GOVERD	Government Intramural Expenditure on R&D
GUF	General University Funds
HEI	Higher education institutions
HERD	Higher Education Expenditure on R&D
HES	Higher education sector
IIR Programme	Programme of Co-Funding of Integrated and Interdisciplinary Research for the Research Cycle 2011-2014
IP	Intellectual Property
IPR	Intellectual Property Rights
MES	The Ministry of Education and Science of the Government of the Republic of Serbia
MESTD	The Ministry of Education, Science and Technology Development of the Government of the Republic of Serbia
MoERD	The Ministry of Economy and Regional Development
MoFE	The Ministry of Finance and Economy
NARD	National Agency for the Regional Development
OECD	Organisation for Economic Co-operation and Development
PRO	Public Research Organisations
R&D	Research and development
RI	Research Infrastructures
RS	Republic of Serbia
RSD	Republic of Serbia Dinars
RTDI	Research Technological Development and Innovation
SF	Structural Funds
SME	Small and Medium Sized Enterprise
S&T	Science and technology
SORS	Statistical Office of the Republic of Serbia
SREF	Programme of Providing and Maintaining Scientific Research Equipment and
Programme	Scientific Research Facilities for the Research Cycle 2011-2014



TD Programme	Programme supporting Research in the Field of Technological Development for the Research Cycle 2011-2014
VC	Venture Capital

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