

**INFORMATION OFFICE OF THE STEERING PLATFORM  
ON RESEARCH FOR THE WESTERN BALKAN COUNTRIES**  
see-science.eu  
(ed.)

# Science and Technology Country Report

## Montenegro

**D9b**

**DRAFT 1.1**  
**September 2006**  
**Last update: January 2007**

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## Contents

1	Introduction .....	2
1.1	Montenegro – A Brief Profile .....	2
1.2	Relations between Montenegro and the EU .....	3
2	Contemporary Institutional Landscape .....	5
2.1	Main Stakeholders Involved in Policy Making in Montenegro.....	5
2.2	International Cooperation .....	7
3	The Input Side of the National Innovation Systems .....	11
3.1	Development of Financial Resources Allocated to R&D.....	12
3.2	Government Sector Expenditure on R&D .....	12
3.3	Business Sector Expenditure on R&D .....	13
3.4	Higher Education Sector Expenditure on R&D .....	14
3.5	R&D Infrastructure .....	15
3.6	Human Resources in R&D .....	16
4	The Output Side of the National Innovation Systems.....	20
4.1	Patenting Activities in Montenegro .....	20
4.2	Publication Activity in Montenegro.....	21
5	National R&D Strategy and Legal Framework .....	22
5.1	Legal Framework for the National R&D Strategy .....	22
5.2	Main Documents Reflecting National Strategies for Research, Development and Innovation .....	24
5.3	Main Fields of Intervention and Research Priorities .....	24
6	Summary and Draft Conclusions .....	27
7	References .....	29
8	List of Acronyms .....	32
	The Project .....	35
	The Authors .....	35
	Reviews and Contributions .....	35

## 1 Introduction

This country report is produced by the “Information Office of the Steering Platform on Research for Western Balkan Countries” and reviews the situation in Science and Technology (S&T) in Montenegro.

The report summarises main papers published by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the South-East European ERA-NET (SEE-ERA.NET), the Austrian “Gesellschaft zur Förderung der Forschung”, and several independent scholars on the issue of S&T in BiH. For the complete list of references please see References in chapter 7, starting on page 29 of this report.

The objective of this study is to enhance our understanding of the national innovation system in Montenegro. An overview of the situation in S&T regarding the main stakeholders, input and output indicators, the national strategies and priorities, and the main documents and laws in the field is given below.

The ‘system of innovation’ approach was taken into account when compiling this report, and it covers important factors influencing the development, diffusion and the use of innovations, as well as the relations between these factors. It does not place emphasis on individual firms or research organisations, but rather on innovation as an interactive and interdependent process.

Relevant organisations in this respect are firms, higher education institutions, government agencies, etc. interacting to create knowledge and innovation. The macro-level of the system is analysed using indicators such as R&D personnel ratios, R&D expenditure, patent application intensity rates, etc.

The report was compiled in autumn 2006 by the Information Office and reviewed by the following actors:

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### 1.1 Montenegro – A Brief Profile

On May 21, 2006, Montenegro exercised its right provided in the Constitutional Charter of Serbia and Montenegro to hold a referendum on independence, which proved successful. The “Declaration of Independence” was adopted by the Montenegrin Parliament on 3rd of June 2006, stating that the Republic of Montenegro is independent with full legal personality under international law. Recognising legitimacy of the whole process, the EU Council adopted conclusions on June 12, 2006, where it stated that the EU and its Member States will develop further relations with the Republic of Montenegro as a sovereign, independent state. In the “Declaration of Independence” Montenegro expressed legal continuance regarding the international treaties and agreements to which the State Union of Serbia and Montenegro was a party and which remain relevant for Montenegro (European Commission 2006).

Montenegro today is a modern parliamentary democracy with a population of approximately 620,000 people (45 per km<sup>2</sup>). Montenegro is geographically located in the Central Mediterranean or South-East Europe, and has a total land area of 13,812 km<sup>2</sup>.

The main unresolved problems in Montenegro result from the dissolution of the State Union with Serbia. Issues for discussion include the implementation of comprehensive institutional, political and economic reforms within the context of the EU's Stabilisation and Association Process (SAP); the adoption of a new constitution in line with European values and standards and negotiations regarding the accession to international organisations, to which the State Union was a party, and continuation of talks regarding future membership in others, e.g. in the World Trade Organisation (WTO) (European Commission 2006).

Regarding the economic situation, real GDP in Montenegro rose by 4.1 % in 2005, despite the 1.9 % fall in industrial production, notably due to problems in the coal mines, the thermoelectric power plant and the steelworks. Tourism and the financial sectors were the most dynamic factors behind economic growth. The budget deficit continued at 2.6 % of the GDP, while public debt decreased to 43 % of GDP and the external debt reached 30.6 % of GDP. The WTO accession process will require further reforms and the establishment of new institutions (European Commission 2006).

## **1.2 Relations between Montenegro and the EU**

Policy development in the Western Balkan countries (WBCs) is often intertwined with the EU accession process. Montenegro started the Stabilisation and Association Process (SAP) on September 26, 2006; the implementation of the required policies and strategies is a necessary prerequisite for creating an innovative knowledge-based economy for the future, helping the countries to withstand competitive pressure in the market economy of the European Union. The government of Montenegro declared European integration to be one of the strategic priorities for the Republic and also decided to inform the EU of its intention to pursue bilateral relations, notably negotiations on the SAA, starting from the point reached before the referendum (European Commission 2006).

Since 2001, Montenegro has benefited from the EU policy advice provided through the EU-FRY Consultative Task Force, later replaced by the Enhanced Permanent Dialogue. The task of the Enhanced Permanent Dialogue is to encourage and monitor reforms on the basis of the European Partnership adopted by the EU Council in June 2004 and updated in January 2006. The current text, which although takes due account of the respective competences and different priorities of Montenegro and of Serbia, will require an adaptation following the change in status of the Republic of Montenegro. The structures of the Enhanced Permanent Dialogue will remain in place and continue to provide support for the reforms in Montenegro until formal contractual relations between the EU and Montenegro are established through the Stabilisation and Association Agreement (SAA) in the context of the Stabilisation and Association Process (SAP). On the basis of decisions made at the Thessaloniki Summit in June 2003,

and confirmed on several further occasions by the EU, Montenegro is a potential candidate country for the EU accession (European Commission 2006).

SAA negotiations with the State Union and the two constituent republics were launched in October 2005. Since then, two official and two technical rounds of talks have been conducted and progress has been made in discussion of the text of the future agreement. Following a negative assessment on the state of co-operation between Serbia and Montenegro and Serbia's failure to comply with ICTY (UN International Criminal Tribunal for the former Yugoslavia) obligations, the Commission decided to call off the next round of negotiations on May 3, 2006. In light of the referendum outcome in Montenegro, the Commission announced its intention to submit a proposal to the Council for a new SAA negotiating mandate for talks with the Republic of Montenegro. The SAA will be a comprehensive agreement between the European Communities and their Member States on the one hand, and the Republic of Montenegro on the other and will provide a legal framework for relations between the EU and Montenegro for the entire period prior to possible future accession. However, no further enlargement with a large group of countries is currently envisaged. The Western Balkan countries are at different stages on the road towards EU membership. Future enlargements will move at a pace dictated by each country's performance in meeting the rigorous standards, in order to ensure the smooth absorption of new members (European Commission 2006).

EU assistance to the State Union of Serbia and Montenegro, combining the CARDS financial programme, macro-financial and humanitarian assistance, has amounted to more than EUR 2.9 billion between 1991 and 2002 (more than EUR 2 billion of which has been allocated since the fall of the Milošević regime in October 2000). The focus and main objectives of EU assistance have evolved during the 1990s, covering conflict management, post-conflict reconstruction and stabilisation, paving the way for a closer association with the EU. The support provided through CARDS in 2005 (EUR 22 million for Montenegro), focussed mainly on the European Partnership priorities, taking account of the political and economic situation in Montenegro, and the requirements that the republic will have to meet in order to be able to conclude SAA negotiations and implement the agreement. Montenegro has also benefited from the regional CARDS programme, which in 2005 had an overall budget of EUR 40.4 million for supporting actions of interest in terms of infrastructure, institution building and cross-border co-operation, in the Western Balkans region (European Commission 2006).

Programming for the preparation of the future Instrument for Pre-Accession Assistance (IPA) during the period 2007-2013, of which Montenegro is also a beneficiary, is ongoing. The IPA aims to provide targeted assistance to candidate countries and potential candidate countries with their EU membership applications and will entirely replace CARDS and other pre-accession financial instruments. The programming will have five components – Transition Assistance and Institution Building; Regional and Cross-Border Co-operation; Regional Development; Human Resource Development and Rural Development – only the first two of which will apply to potential candidate countries. The IPA will allocate over EUR 11 billion during the 2007-2013 period (SEE-science 2006).

Even though science is not among the main objectives of the IPA, support of S&T infrastructure and related activities is envisaged. This significant change is mainly a result of the following dynamics: on the one hand, Serbia's formal request to CARDS for funding S&T related activities, which was supported by EU Member States, and on the other hand, the SEE-ERA.NET project which drew particular attention to the issue of S&T support and pushed the matter to specific contacts with EC officials. Hence, gaining support is mostly in the hands of Western Balkan countries which need to demonstrate certain efforts in formulating and submitting requests to the relevant authorities. The SEE-ERA.NET project, as well as the Steering Platform launched in June 2006, could provide the necessary support behind this process, acting as a forum for the exchange of experiences and best practices among the Western Balkan countries, as well as through focused and co-ordinated interventions targeted at European Commission services and the EU Member States (Bonas 2006).

As stated in the "Shared Vision" of the *Thessaloniki Agenda for Western Balkans*, in their effort to adapt to the pervasive knowledge economy and to global competition, the citizens of the Balkan countries need to exploit the high level of motivation for social mobility and their relatively good educational background, as well as combining scientific and technological knowledge with entrepreneurship. This will create higher added value and bestow competitive advantages on the region. In this respect, science, research and technological development are seen as essential tools for future economic stabilisation and growth in the region (CORDIS 2003b).

## **2 Contemporary Institutional Landscape**

The transition of Serbia and Montenegro's S&T system started following the gradual dissolution of the former Federal Republic of Yugoslavia, the destruction caused by the war and the subsequent brain-drain. The institutional landscape has also been altered during the process. The following chapter tries to map the current main stakeholders in the National Innovation Systems, relevant cooperations and the legal framework defining the system.

### ***2.1 Main Stakeholders Involved in Policy Making in Montenegro***

During the 1990s, the FRY Government Programme for Technology Development provided the main financial and moral support for the innovation activity in industry. Since sanctions prohibited international technology trade, "in-house" innovative activity was the main source of new technologies and activities (Kutlaca 1998). Even prior to the final dissolution of the State Union, the two entities carried out R&D activities completely independently, and thus needed to be analysed separately. A few institutions belonging to the innovation system have functioned on the State Union level, but the largest part of the R&D system was located in the Republic of Serbia (Kutlaca 2005a).

The Ministry of Education and Science (MoES) is the main research funding body in Montenegro. It follows the Republic of Montenegro's long-term requirements for development, transfer and application of scientific and technological achievements, especially from the point of view of greater valorisation of natural and man-made resources of the country. MoES creates the strategy for scientific and technological development, establishing a base for further development of knowledge and creativity. Furthermore, it takes account of the results and problems of science and technology application, the effects of public investments into scientific and technological development, and the quality and use of research infrastructure. It closely monitors status, problems and trends in the development of the research system of the country, especially in the field of scientific research priorities (biotechnology, marine biology, tourism, energy efficiency, telecommunications, computerisation and research on environmental protection, materials-related technologies, health care etc.), as well as speed, range and depth of diffusion of new technologies to the national economy and the obstacles faced in the process (Ministry of Education and Science of Montenegro 2004).

Another important stakeholder in Montenegro is the University of Montenegro. It was founded in 1974 and is the only public university in Montenegro. It comprises several faculties (18 at the time of writing) and is located in 9 towns throughout Montenegro (Podgorica, Nikšić, Cetinje, Kotor, Budva, Bijelo Polje, Berane, Herceg-Novi - Igalo and Bar). Reforms in higher education started in Montenegro in the year 2000 as a consequence of the transition in society, the need for integration into European and international structures, transition in the economy, the Bologna Process and the employability concept (Ministry of Education and Science of Montenegro 2004). Since the year 2004/2005, the regime according to the Bologna Declaration and the principles of the European Credit Transfer System (ECTS) has been applied in all faculties. Full implementation is foreseen by the year 2008 for undergraduates, 2009 at postgraduate level and 2012 for doctoral studies.

The Montenegrin Academy of Sciences and Arts (MASA) was established in 1978 and encompasses departments of natural sciences, social sciences and arts, plus the "Njegoš" Institute and other operative bodies. Its activities involve the organisation of scientific research projects, conferences and meetings, as well as enhancing international cooperation and publishing (Montenegrin Academy of Sciences and Arts 2005). ZAMTES is the Republic Agency for International Scientific, Educational, Cultural and Technical Co-operation in Montenegro. Further details are provided in chapter 2.2 International Cooperation.

In June 2005, the government of Montenegro established the National MREN (Montenegro Research and Education Electronic Network) for collaboration with EU institutions.

Table 2.1: Main S&T Stakeholders of Montenegro (Ministry of Education and Science of Montenegro 2004)

Main ministry in Montenegro competent for S&T:	- Ministry of Education and Science
Other ministries with importance to	- Ministry of Economy

the S&T sector:	<ul style="list-style-type: none"> <li>- Ministry of Foreign Affairs</li> <li>- Ministry of Health</li> <li>- Ministry of Agriculture, Forestry and Water Management</li> <li>- Ministry of Maritime Affairs and Transportation</li> <li>- Ministry of Environmental Protection and Physical Planning</li> </ul>
Other important stakeholders:	<ul style="list-style-type: none"> <li>- Council for Scientific Research Activities, nominated by the Government of Montenegro</li> <li>- Montenegrin Academy of Sciences and Arts (MASA)</li> <li>- ZAMTES (Republic Agency for International Scientific, Educational, Cultural and Technical Co-operation of Montenegro)</li> <li>- Centre of Information System</li> <li>- Council for Higher Education (within the Ministry of Education and Science)</li> </ul>
Main university / research institutions:	<ul style="list-style-type: none"> <li>- University of Montenegro</li> <li>- Institute for Biotechnology</li> <li>- Institute for History</li> <li>- Institute for Maritime Biology</li> <li>- Institute for Foreign Languages</li> <li>- Institute for Geology</li> <li>- Institute for Steel Production</li> <li>- Institute for Aluminium</li> <li>- Institute for Strategic Studies and Prognoses (ISSP)</li> <li>- Institute for Health Care</li> <li>- Agency for Eco-toxicological Investigations</li> <li>- Centre for Meteorology and Seismology</li> <li>- Private University Mediteran</li> </ul>

Higher education may be provided by universities and higher education institutions, as long as it is licensed and accredited in accordance with the Law on Higher Education. The Ministry of Education and Science issues licenses to the institutions and is also responsible for administering changes and divesting institutions of a license. Based on this law, the first private Faculty of Tourism and Hotel Management opened in September 2004 in Bar, Montenegro, enrolling 50 students. At the time of writing this report, there is one private university called University Mediteran and three individual private faculties which enrolled about 1,500 students. One other private university is preparing the documentation for opening (Skuletic 2006b).

## **2.2 International Cooperation**

The research community in Montenegro is small, thus it is of vital importance to preserve it and promote links with other international researchers, in order to establish a platform for the creation of knowledge-based society. The RTD strategy in Montenegro is oriented towards improving research capacities in the

thematic priority domains of the Framework Programmes (FP) by reinforcing their S&T potential, by supporting and mobilising human and material resources, by disseminating scientific information and research results, by facilitating communication, by alleviating brain-drain and by improving responses to the socio-economic needs of the country. Montenegro's bilateral and multilateral cooperation programmes should allow the possibility to create links inside the RTD market and facilitate stronger participation in European research endeavours, thus enhancing research perspectives in bilateral and multilateral activities (Ministry of Education and Science of Montenegro 2004).

Countries of the Western Balkans have seen a constant renewal of international cooperation and support, especially in the last five years. This cooperation was substantially supported by many international organisations as well as by individual countries through bilateral and multilateral programmes (also providing significant benefits to the R&D sector). The largest part of financial support in this respect came from the funds of the Stabilisation and Association Process, the CARDS programme, the Stability Pact for Southeast Europe, the European Investment Bank, the European Bank for Reconstruction and Development, HP DAAD, etc. The European Union's Tempus programme has been important in the area of higher education, while the inclusion of the Western Balkan countries into the 6<sup>th</sup> Framework Programme (FP6) for R&D (Montenegro participated in FP6 as a partner in the project consortia), and their gradual integration into the European Research Area (ERA), has also been of particular importance. Inclusion of these countries into the European Investment Bank's Innovation 2000 Initiative ought to prove useful as well. Regarding multilateral cooperation in the area of science and research, the Western Balkan countries have closely co-operated with many specialised United Nations (UN) agencies, such as UNESCO, UNIDO, UNDP, UNECE<sup>1</sup>. Some other international organisations, such as the World Bank and USAID, have also been important donors and have helped in the area of R&D (Uvalic 2006). USAID has adopted a "Strategy Statement" for Montenegro (2006-2011), which addresses Montenegro's development needs in line with the U.S. government's foreign policy objectives. In 2006, USAID administered approximately USD 12 million to Montenegro in support of the mission's strategic objectives – namely, democratic governance, enterprise growth and political stability (USAID 2005).

Many regional projects have been launched with the objective of promoting regional cooperation in South Eastern Europe. Regional scientific cooperation within the Western Balkans is currently being promoted by several regional organisations: the Central European Initiative (CEI), the Alps-Adriatic Task Force, the Stability Pact for Southeast Europe, etc. Montenegro has also filed an application for membership to the International Atomic Energy Agency (IAEA)<sup>2</sup>. Regional networks also include initiatives to aid the participation of Western Balkan countries in the EU Framework Programmes for R&D, as defined by the EU-Balkan countries Action Plan on Science & Technology adopted at the Ministerial Conference in Thessaloniki on June 26-27, 2003. The "Action Plan",

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<sup>1</sup> Please see List of Acronyms

<sup>2</sup> In June 2006, IAEA membership of Serbia and Montenegro was continued by the Republic of Serbia. Subsequently, the Republic of Montenegro applied for membership to the IAEA (June 14, 2006), a process that is pending completion.

along with the "Shared Vision", defined the priorities of the research cooperation and provided a detailed examination of all possible sources of funding, thus contributing to the economic growth of Balkan countries and aiding their integration into the European Research and Innovation Area (CORDIS 2003a).

Montenegro also collaborates with the Joint Research Centre (JRC) which is a Directorate-General providing independent scientific and technological support for EU policy-making. Knowledge and information is gathered using specific application/issue-oriented research within the seven JRC Institutes as well as through close cooperation with over 1,000 public and private organisations in 150 networks within Member States and applicant countries. The JRC aims to contribute to the goals of the European Research Area and provide S&T support to EU policies. Its efforts in the ERA focus on five activities: developing scientific reference systems, networking, training and mobility, accessing and using its infrastructures, and a dedicated effort to support enlargement (European Commission 2004). The government of Montenegro believes that the collaboration with the JRC could be of vital importance in preventing further brain-drain, especially in encouraging talented students to stay and work in Montenegro, by making university and research careers more attractive (Ministry of Education and Science of Montenegro 2004).

The Ministry of Education and Science and the University of Montenegro supported mobility of junior and senior researchers with individual mobility grants. There have also been foreign researchers working in Montenegro in the fields of bio-technical, technical-technological and medical science, most frequently coming from Russia, Italy, France, Slovenia and Germany (Uvalic 2006).

Current bilateral S&T cooperation has also been used as a starting point for identifying partners for FP6, COST and EUREKA. The new state of Montenegro is not yet a member of COST, which has developed into one of the largest frameworks for research cooperation in Europe and is a valuable mechanism for co-ordinating national research activity. According to the latest reports, COST has around 200 actions and involves nearly 30,000 scientists from 34 European member countries and more than 80 participating institutions from 11 non-member countries and non-governmental organisations. Ease of access for institutions from non-member countries also makes COST a very interesting and successful tool for tackling topics of a global nature.

In December 2006, thanks to an international endeavour, MoES published the 'Pilot Joint Call' (PJC) for the SEE-ERA.NET project along with thirteen other countries. The main goal of this project is to explore and utilise the synergies of bilateral scientific-technological agreements of partner countries. However, this call is only the introduction to a bigger, "Real Joint Call", which will be announced after the conclusion of the PJC. The idea behind this call is to connect scientists, who can apply for funding for cooperation through multilateral research projects, thematic networks or connection of scientific teams or institutions, but not individually. Projects in the following three fields will receive funding: "Environmental Protection", "ICT" and "Food, Agriculture and Biotechnology" (Ministry of Education and Science of Montenegro 2006).

Projects based on bilateral inter-governmental agreements have been numerous, while further integration is expected in line with the activities of the Southeast European ERA-NET (SEE-ERA.NET) (Uvalic 2006).

The project ERA-WESTBALKAN aims at integrating the Western Balkan countries into the European Research Area. Over the course of two years, the National Contact Points in BiH, Serbia, Montenegro and FYR of Macedonia were established, trained and supported. From January 2007, the project is being continued and enlarged as ERAWESTBALKAN+. The focus is on the integration of scientists from the region into the European Research Area and specifically the Framework Programmes. It provides support to Montenegrin researchers through the project partner ZAMTES (The Republic Agency for International Scientific, Educational, Cultural and Technical Co-operation of Montenegro), an institution belonging to the government of Montenegro, established some 30 years ago. The Department for International Scientific and Technical Co-operation also performs the following duties:

- preparation, co-ordination and implementation of the S&T programmes and projects of scientific and technical nature
- initiation and co-ordination of immediate collaboration between Montenegro and foreign institutions and industrial organisations
- participation in the preparation of multilateral and bilateral programmes on the basis of which RTD projects in Montenegro are being realised
- professional training abroad within multilateral and bilateral programmes, organisation of international conferences, gatherings and seminars, etc.

Montenegro has also been included in the two ongoing projects, SEE-GRID 2 and SEEREN2, dealing with South Eastern European research and education e-infrastructure and networking (Skuletic 2006b).

Another relevant FP6 project is IS2WEB, a support action to familiarise scientists with the IST (Information Society Technologies) priority of the Sixth Framework Programme for Research and Development. SEE-INNOVATION is a project with a similar approach but focussing on the integration of SMEs in the field. As the inclusion of additional partners is not foreseen, Montenegro is covered by the Serbian partner in both projects (Belgrade Open School and Information Society).

Montenegro held the FP6/INCO partner country status under the EU-WB Countries Action Plan in S&T and participated in two FP6 projects. Furthermore, participation was reported for two UNESCO projects, 12 other multilateral projects (financed by UNDP, CERN, NATO, IAEA, COST) and other bilateral projects, mainly realised with partners from Greece, Slovenia and France. Within the Tempus programme, Montenegro contracted 18 projects and more than 20 international mobility grants up until the end of 2006 (Skuletic 2006b).

WUS (World University Service) Austria, a non-profit making organisation established in Graz in 1983, has developed a regional focus on South Eastern Europe since 1994. Since its shift of focus towards the Western Balkans, it has successfully realised various projects; to mention only few – CEP (Centre of

Excellence Projects), NIP (Networking Infrastructure Projects), Training Courses on Project Management and International Co-operation, Internet and Computer Training Programme etc. Montenegro also benefits from the ongoing World University Service (WUS) projects – Course Development Programme Plus, Brain Gain Programme, Counselling and Information Centres, and others (WUS Austria 2006).

Montenegro has also been a member of the Union of Mediterranean Universities since its establishment in 1983. The Union is active in promoting further development of science and cultural cooperation between its members – 175 universities and various research centres and organisations from 20 Mediterranean countries. Furthermore, Montenegro is also active as a hosting country of the Summer Academy, organised under the auspices of the Stability Pact for South Eastern Europe and German Institute for Academic Mobility (DAAD). For the past eight years, the Summer Academy has been welcoming top senior technical and computer science students from Southeast Europe and Germany (Skuletic 2006a). Other regional networks include the Inter-Balkan Forum on IST and the Balkan Physical Union.

In total, Montenegro dedicates 15 % of its total R&D budget to international cooperation. The latest development which came at the time of writing this report is the letter of intent sent by the Montenegrin Minister of Education and Science, Prof. Dr. Slobodan Backovic, to Janez Potocnik, European Commissioner for Science and Research, expressing Montenegro's interest in accession into the Seventh Framework Program for Research and Technology, thus obtaining the status of an Associated country within FP7 (Skuletic 2006a).

### **3 The Input Side of the National Innovation Systems**

The current economic situation in the Western Balkan countries still poses significant constraints on national R&D policies. Most countries in the region are at less than 30 % of the EU-25 GDP per capita average, hardly reaching 60-80 % of their 1989 GDP. The restrictive fiscal and monetary policies, necessary for attaining macroeconomic stabilisation, allow limited public expenditure and have generally contributed to the low investment rates, including those experienced in the R&D sector. Although financial assistance received from abroad is significant, it is not always provided on a continuous basis or with the best interests (Uvalic 2006).

Regarding the input indicators for the S&T system, some questions (e.g. the amount spent in terms of the gross domestic product (GDP), volumes, growth rates etc.) need to be addressed. Here a distinction is made between private and public investment. R&D investment can be considered as an indirect measure of a country's innovation capacity (Fischer 2006).

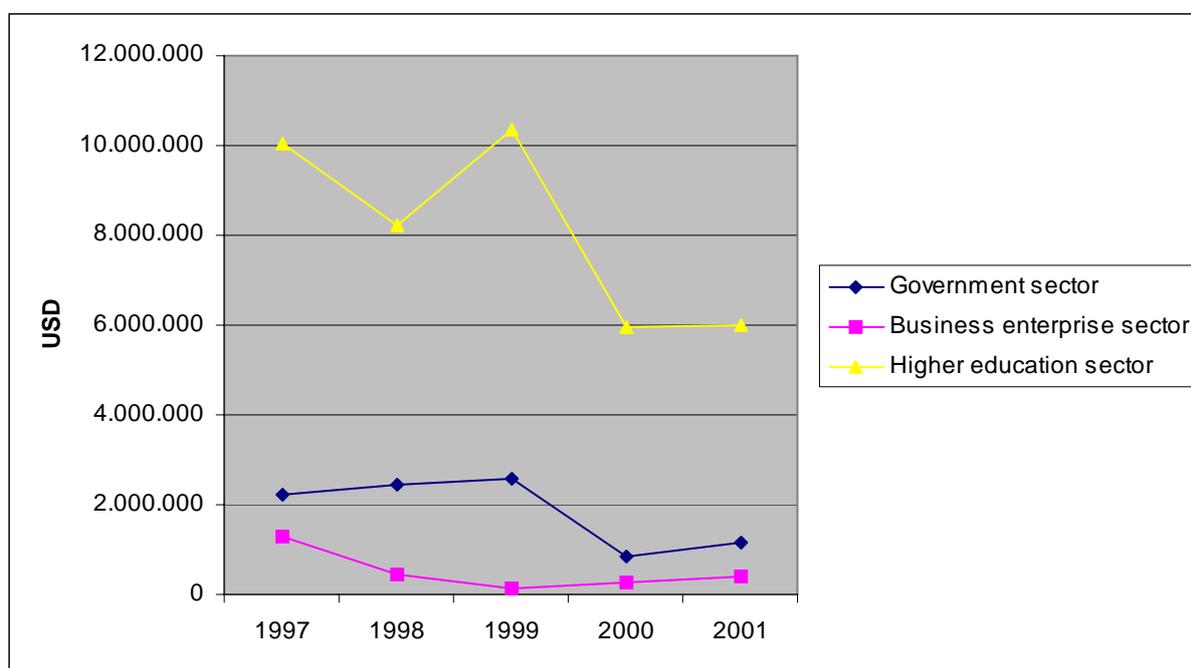
The sources which report on R&D expenditures provide some conflicting figures for the different categories, e.g. (Uvalic 2006) and (Kutlaca 2005b).

### 3.1 Development of Financial Resources Allocated to R&D

Generally, the dynamics of expenditure can be used as an important indicator of knowledge creation and absorption.

In Montenegro, the higher education sector is the sector with the highest expenditure on research and development, and as in other countries in the WB region, the business sector provides almost negligible investment. The downward trend of government expenditure was especially noticeable between the years 1999 and 2000.

Figure 1: Dynamics of Expenditure for R&D per Sector (State Statistical Office according to (Kutlaca 2005b))



### 3.2 Government Sector Expenditure on R&D

As already stated above, a dramatic downward trend in government expenditure was registered in Montenegro between the years 1999 and 2000 (following the NATO intervention in the State Union in 1999). After the year 2000, a slight but steady upward trend in GOVERD can be observed, although the share of the government expenditure on R&D is still well below the requirement.

Table 3.1: Government Expenditure on R&D (GOVERD) (Source: State Statistical Office according to (Kutlaca 2005b))

	1997	1998	1999	2000	2001
R&D expenditure in total (in USD)	2,233,671	2,451,944	2,595,711	827,626	1,162,139
R&D expenditure as % of GDP	0.25	0.32	0.23	0.16	0.11

Table 3.2: Government Expenditure on R&D (GOVERD) (Skuletic 2006b)

	2002	2003	2004	2005	2006
R&D expenditure in total (in EUR)	1,301,000	1,433,000	1,535,000	1,644,000	1,759,000
R&D expenditure as % of GDP	0.14	0.09	0.19	0.21	0.24

In an interview with the monthly scientific bulletin, "Prosvjetni rad", Sreten Škuletić, president of the Commission for Scientific Activity and International Cooperation at the Montenegrin Ministry of Education and Science, gave a critical overview of the current situation in the S&T sector in Montenegro<sup>3</sup>. Škuletić expressed satisfaction with the financial sources allocated from the budget to the Ministry in 2005 – these sources were finally sufficient to cover all requirements, thus fulfilling the criteria for financing. According to Škuletić, the MoES allocated EUR 722,000 in 2005, financing 56 projects which received a positive review from the Ministry (out of 81 projects submitted). The projects were approved for two-year financing, and the MoES allocated EUR 383,500 during the first year. However, the expected increase in financial sources in 2006 failed to occur and the Commission has expressed its disappointment with the situation, questioning the further existence and development of scientific activities in Montenegro. In keeping with the financial responsibilities of the previous year, the Ministry was unable to open any new contests for scientific projects, MSc or PhD theses, or scientific newspaper publications. Škuletić has revealed that the government is planning to increase R&D expenditure to 0.75 % of the GDP by 2007 (this percentage is currently significantly lower, see figures above). Montenegro has also signed the Lisbon declaration which aims to increase this percentage to 3 % of the GDP by 2010. According to Škuletić's overall assessment, science and research in Montenegro is not receiving nearly enough attention and support from the state; furthermore, the financial sources allocated to the Ministry in 2006 were 47 % lower compared to those received in 2004. In view of such conditions, little optimism regarding future improvements is possible (Skuletic 2006a).

The Ministry's expenditure by scientific field (1996-2006) focused on Biotechnology and Medicine (45 %) and Natural Sciences and Engineering (40 %). The remaining 15 % of the budget funds research in the social sciences and humanities (Skuletic 2006b).

### 3.3 Business Sector Expenditure on R&D

R&D investments in the business enterprise sector are evaluated by looking at the level and dynamics of business sector R&D expenditure at the aggregate country level. These activities are particularly essential for the innovative output and competitive dynamics of a country (Fischer 2006).

The relative importance of the business sector's R&D efforts is indicated by the level of business expenditure on R&D (BERD) as a share of GDP. The relative importance of BERD in the total economic activity of South Eastern Europe (0.24 % in 2003 as calculated by Fischer (2006), who includes Bulgaria and

<sup>3</sup> Prosvjetni rad, N°3-4, 2006.

Romania but not BiH and Albania, due to the lack of data), lags considerably behind that of the EU-15 (1.26 % in the year 2000). In Montenegro, the level of BERD expenditure as a percentage of GDP was 0.15 % in 1997, merely 0.01 % in 1999 (the lowest percentage of all the years measured) and 0.05 % in 2001.

The input of the business sector in R&D activities in comparison to overall R&D activities reveals the relative importance of profit-oriented knowledge creation and absorption. Nevertheless, thorough examination of the business sector's share of total R&D expenditure shows considerable variation within the Western Balkan region (only in Romania was business sector research responsible for more than 50 % of total R&D, which is on a par with the EU-15 average of 65.5 % in the year 2000). In Montenegro, a very low proportion of total R&D (5.5 % in 2001, according to statistical data obtained by Kutlača, 2005) was spent on business research, thus reflecting a relatively low level of business sector knowledge investment in comparison with knowledge invested by the government and higher education sectors (Fischer 2006).

The desolate state of the business and industry sectors, which have deteriorated in the past 15 years, explains the low level of business sector investment, although exact data is hardly available (Skuletic 2006a).

### **3.4 Higher Education Sector Expenditure on R&D**

University research represents one of the key activities within the higher education sector regarding the national innovation systems, and providing scientific and technological knowledge to be disseminated and utilised in the economy. However, as primary suppliers of fundamental research, universities do not only contribute to the economy through the direct provision of applicable results, but also through the diffusion and adoption of skills and techniques and through professional networks and other forms of communication channels created by academic research (Fischer 2006).

According to statistical data obtained from the State Statistical Office by Đuro Kutlača, the expenditure in the higher education sector, research institutes and other organisations with research units in 2001 was USD 6 million<sup>4</sup>, which represented 0.76 % of the 2001 GDP. Although, as regards Montenegro this data is regarded unreliable, and official data on the budget of the University of Montenegro, the only public university in the country, is published in the Bulletin of the University of Montenegro (No. 211, from 15.11.2006) (Skuletic 2006a; University of Montenegro 2006).

Table 3.3: Budget of the University of Montenegro for 2006, provided by (Skuletic 2006a)

Amount dedicated to the faculties	9.293.874 EUR
Amount dedicated to the institutes	1.372.719 EUR
Amount dedicated to other units, organisations, inside expenses, students' activities,...	3.813.407 EUR
Total amount obtained from the government	14,480,000 EUR

<sup>4</sup> EUR 6.7 million on 31.12.2001, <http://www.oanda.com/convert/classic>

### **3.5 R&D Infrastructure**

In her survey on the National Systems of Research and Development in the Western Balkan Countries (compiled for the purposes of the SEE-ERA.NET Consortium), author Milica Uvalić established that the existing scientific infrastructure in Montenegro has a number of weaknesses – amongst them, large differences in the development of research units, a lack of adequate premises for laboratories and libraries, poor financial standing of research projects, a lack of interest for studies where experimental research is obligatory e.g. engineering, and old and inadequate equipment (or lack of it). Significant investment is required in printing and electronic equipment, which would help enhance research and learning resources, as well as providing new equipment, facilities and services. Thus, a clear strategy for R&D ought to be established, embracing all research institutes (Uvalic 2006).

R&D infrastructure was much better and more modern prior to 1990 than it is currently. A lack of financial resources, as well as the international sanctions prevented an update of technical equipment and foreign imports were impossible, therefore further preventing advancement.

Regarding the ICT (Information and Communication Technology) sector - there were over 16,000 internet hosts per 100,000 inhabitants and 100 PCs per 1,000 inhabitants in 2006. Internet penetration in Montenegro in 2004 fluctuated around 16 % (almost 100,000 people were using the internet). This share was somewhat similar to the global average in 2006 (approximately 16.7 % or 1 billion internet users around the world, according to the latest statistics), although it does not compare to the EU average (52 % or about 240 million internet users in 2006, according to the Internet World Stats<sup>5</sup>). In order to demonstrate an awareness of the importance of ICT in educational process and a readiness to improve the existing situation, the government adopted a document called "Strategy of introducing ICT into the Education System of Montenegro – Up to the University Level" (2003)<sup>6</sup>. At that time, the Information Technology curricula played a very insignificant role in the education system of Montenegro and the government tried to improve the situation by drafting this strategy document (a timeframe for the period between 2005-2010 was set), with the final aim of establishing a contemporary Montenegrin Educational Information System – MEIS. Moreover, among the first tasks of the Ministry of Education and Science was to decrease the number of students per computer (currently around 50 students per computer, which is discouraging compared to the European average of about 14 students per computer). The Ministry is planning to improve this average in near future to 5 students per computer by 2010, which would place Montenegro in line with the most developed countries in Europe (The Government of Montenegro 2003).

The Montenegrin Research and Education Network (MREN) was established in June 2005. It encompasses all networking services and facilities, which support

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<sup>5</sup> <http://www.internetworldstats.com/stats4.htm>

<sup>6</sup> more details in chapter 6.2 – starting on page 23 of this report

the communication and information requirements of the education and research community in Montenegro.

MREN aims to create, promote, offer, participate in, and preserve the requisite bases for effective use of modern telecommunication technologies in the fields of education and research in Montenegro. The main goal is to connect MREN to GEANT, which is reserved specifically for research and educational use, via a high speed fibre optic connection. MREN's target is to support the substantial use of the Pan-European and world research networks by Montenegrin researchers, scientists, lecturers and students, as well as to facilitate the integration of Montenegrin educational, research and cultural resources in the international information space (Uvalic 2006).

The libraries and the information and communication technology services should be rationalised to provide more effective services, as existing technical equipment and informatisation do not meet international standards. Since May 2006, the University of Montenegro is subscribed to electronic databases THOMSON and EBSCO, which provide access to a significant number of articles from the most renown scientific magazines and publications in the fields of Technology, Medicine, Economics, Sport etc. A new system of mutual categorisation among the Montenegrin libraries was established in December 2001 using the COBISS system, as well as a mutual bibliographic base (COBIB CG), combining the local University Library, and the Central National Library of Montenegro. Some of the faculty libraries have local systems for computerized documentation, so their databases cannot be reached through the internet. The University of Montenegro possesses an academic computer network, maintained and developed by the Centre of Information System (CIS), which provides internet connectivity. However, the CIS equipment ought to be improved; presently, the communication infrastructure between the CIS server and the units is based on an optical fibre with low speed communication through copper twisted pairs. There is only one 4Mb link with Belgrade, which should have been upgraded to 34 MB link by the end of 2006, and a 34 Mb link with Greece (through Serbia) using the SEEREN-SENSE project foundation. The research units' communication equipment is generally satisfactory, apart from the lack of multimedia lecture halls (Uvalic 2006).

### **3.6 Human Resources in R&D**

The mass emigration of young, educated people in highly sought-after fields of expertise has been one of the most alarming phenomena that the countries in the Western Balkans region have had to face since the devastating war and break-up of the former Yugoslavia. This loss of talent has led to an impoverishment of national capacities at a crucial time for reconstruction and development.

Consequently, the number of scientists in R&D in Montenegro is reported to be low. In 2004, the University of Montenegro was employing over 700 scientists (approximately half of them holding a PhD degree and the other half holding a MSc. degree). Outside the University, another 600 scientists were employed (Ministry of Education and Science of Montenegro 2004).

In 2006, according to the Bulletin of the University of Montenegro, the university employed 394 scientists with a PhD degree and 319 scientists with an MSc degree, as full-time engaged, and 242 + 98, as part-time engaged (Skuletic 2006a; University of Montenegro 2006).

There were 16,236, students enrolled in university studies during the academic year 2006/2007, a number that has increased especially during the past two years – e.g. in 2006 4,443 students were enrolled whereas in the previous 10 to 15 years the number enrolled hardly exceeded 1,500. 58 % of students enroll in humanity studies (including Business, Financial Management, Law etc), 40 % in Engineering Studies, Natural Sciences etc. and 2 % study arts (Skuletic 2006a).

The breakdown of researchers by scientific field shows that the largest concentration work in the field of Social Sciences and Humanities, followed by Engineering and Technology (Ministry of Education and Science of Montenegro 2004).

Table 3.6: Relative Structure of Scientific Researchers by Scientific Fields (Skuletic 2006a)

Natural and Mathematical sciences	13 %
Biotechnology	7 %
Engineering and Technology	25 %
Medicine	7 %
Social sciences and Humanities	48 %

There are, however a disproportionate number of researchers in the field of Social Sciences and Humanities (48 %) compared to the budget that the Ministry of Education and Science allocates to this scientific field (15 %). This is probably due to the constant increase in the humanities student population. The actual number of first-year students in the Faculty of Economics is about 700, while in the faculty of Metallurgy and Technology, the number of students hardly exceeds 50 (Uvalic 2006).

The Ministry of Education and Science adopted a Human Resource Development Programme in 2004, the main instruments of which were 90 scholarships for master studies at home and 15 scholarships for master studies abroad; financial support of 30 PhD students working on basic or applied projects at home, as well as 26 PhD researchers abroad (for 2 to 6 months). Additionally, the Ministry financed 91 participations in scientific conferences including travel and registration costs (Ministry of Education and Science of Montenegro 2004; Skuletic 2006b).

Human resources play a key role when it comes to knowledge production and, subsequent, economic and technological development. Availability and quality of human resources (being both producers and diffusers of knowledge) in S&T, forms a crucial element on the path towards a knowledge society (Fischer 2006). It is quite obvious though that the recent trend regarding human resources in countries of the Western Balkans has been extremely variable. In some countries, the number of researchers and scientists has been increasing (e.g. in Albania and Croatia), while in others (e.g. in the FYR of Macedonia, Montenegro and Serbia) it has been stagnating or declining (Uvalic 2006). In 2003, Serbia and Montenegro reported 3.5 researchers per 1,000 labour force, which was on a

par with some of the EU-15 countries (e.g. Greece and Portugal), but still well below the EU-15 average (5.4 researchers per 1,000 labour force) (Fischer 2006). There is, however, no precise data on how many of these researchers actually came from Montenegro (as compared to Serbia).

According to the national statistics reported by Kutlača (Kutlaca 2005c), the total number of researchers in Montenegro in the last decade has been more or less constant. There were about 642 researchers in the year 2000, almost 100 more compared to 1990. However, after the year 2000, a slight downward trend was registered, with 626 researchers reported in 2001 (Kutlaca 2005c).

Table 3.6: R&D Personnel in Total, FTE and HC (Kutlaca 2005c)

	1990	1999	2000	2001
R&D personnel (fulltime equivalence, FTE)	852	775	806	768
R&D personnel (headcounts, HC)	1,082	1,128	1,217	1,223

Of total R&D personnel in 2001, 57.7 % were engaged in the higher education sector, 35.5 % in the government sector and 6.8 % in the business sector (Kutlaca 2005c) as illustrated in the table below.

Table 3.6: R&D Personnel, Distribution by Sectors, in absolute numbers – FTE (Kutlaca 2005c)

	1990	1999	2000	2001
Government sector	374	302	265	273
Business sector	193	23	60	52
Higher education sector	285	450	481	443

Human resource potentials in S&T can also be increased by producing Science and Engineering (S&E) graduates. Degrees in S&E fields of study formally qualify their holders for employment as researchers, scientists and engineers. In this respect, the State Union of Serbia and Montenegro demonstrated a positive trend, having the highest proportion of students enrolled in S&E within the region. However, the exact proportion of S&T students solely in Montenegro was uncertain. Furthermore, a negative growth rate of -1.2 % has been registered in the period between 1997-2001 (Fischer 2006).

In order to improve the alarming situation in the country, UNESCO (in cooperation with Hewlett-Packard) has devised project to alleviate the brain-drain in the Western Balkans region. The project's general aims for Montenegro were laid out under the following objectives (UNESCO & Hewlett Packard 2003):

- promoting successful mechanisms to alleviate brain-drain
- attempting to stop mass emigration of young intellectuals
- strengthening intellectual and scientific capacities
- establishing a website to identify young scientists who have left Montenegro in last 10 to 15 years
- creating a database of experts in the identified disciplines who have left the country and have expressed an interest in contributing to the project

- maintaining effective two-way communication between young professional people who have left Montenegro and their colleagues who have remained in the country
- developing mechanisms to promote contacts and offer opportunities for shorter and longer-term positions for returning experts as well as for their "virtual presence" and continued contribution to cultural, scientific and economic life
- opening visiting positions, organising meetings and fostering possibilities for experts within the Diaspora to serve as mentors for advanced home students in corresponding fields, as well as organising multidisciplinary master class courses, distance education, an alumni organisation network, etc.
- creating a network of highly qualified experts in specific fields world-wide, creating opportunities for them to take part in shorter-term or longer-term assignments in their countries of origin
- creating virtual links with experts outside the country
- publishing joint scientific and technical papers and reports
- carrying out common work on scientific and technical projects etc.

The project was divided into two sub-projects, according to areas of expertise: (1) Electrical Engineering and Information Technology and (2) Physics. Phase III of the project was due to finish in December 2004 (the University of Montenegro's proposed budget for that year was EUR 15,000). Sreten Škuletić, president of the Montenegrin Commission for Scientific Activity and International Co-operation at the Ministry of Education and Science and the coordinator of this project in Montenegro, has considered the project as very successful. Many foreign professors and eminent scientists have been involved in the project, along with intellectuals of Montenegrin origin living and working abroad. The project itself was responsible for the creation of a database which re-established the connection between the scientific diaspora and the University of Montenegro. Škuletić expressed great satisfaction with the response received, stating that all contacted scientists proved ready to participate in future projects. Although established merely as a pilot-project for the duration of one year, the overall assessment was very positive, leaving the University of Montenegro with valuable computer and communication equipment and a functioning database to help maintain, broaden and deepen the connections with the scientific community abroad (Skuletic 2006a). This project and its achievements were also regarded as very successful by both UNESCO and HP representatives.

According to Fischer, the results obtained in his survey suggest that the future outlook is optimistic, especially with respect to the fact that a greater percentage of young people are becoming more highly qualified, offering potential relief to the shortages created by the transition to a knowledge-based economy. However, the author fears that investment in R&D is not the only prerequisite for achieving these goals. Rather, there are multiple components to investment (e.g. productivity, good performance in science and technology, efficient use of information infrastructure and an effective education system (Fischer 2006)), all of which need to produce successful results in order to achieve a smooth transition to a knowledge-based economy (Fischer 2006).

## 4 The Output Side of the National Innovation Systems

The output of an innovation system is manifested through the new knowledge, new products and processes which are produced. Indicators such as the 'Gross Expenditure on Research and Development' and the 'Number of Researchers' provide a measure of the resources potentially allocated to innovation. This chapter focuses on the results of the innovation processes and their output indicators (Uvalic 2006).

### 4.1 *Patenting Activities in Montenegro*

Among other approaches, innovative output can also be measured by patent data, the most important advantage of which is the wealth of the information supplied. A patent file granted by the European Patent Office (EPO) provides data on the invention, which is protected by the patent through the title, abstract and technological classification. Furthermore, patent data provide the only output measure available for almost all countries in the world, including the Western Balkan countries (Hörlesberger 2006).

European inventors today have a choice between two alternatives when seeking patent protection for their inventions: the European Patent Office (EPO) and national patent offices. The EPO was set up to provide patent protection through a single procedure, defining the granting of patents in some or all of the contracting states of the European Patent Convention (EPC). The procedure for obtaining a patent at the EPO consists of two phases and sometimes a third phase dealing with possible objections. In contrast to national patents that are valid in only one country, a European patent gives its proprietor equivalent rights to a national patent in each member state. Moreover, European patents may also be effective in some countries, including Montenegro, that have not yet acceded to the EPC. Serbia and Montenegro have held a so-called 'extension state' status at the EPO since November 1, 2004. This means that although the State Union recognised European patents, it was not formally a member of the organisation (European Patent Office 2006).

A second barrier to patenting is the cost associated with a patent application. Studies estimate that the cost of an application and the 10-year maintenance of a patent at the EPO is approximately EUR 32,000 (Roland Berger Market Research 2004). In contrast, applications to national patent offices may be less expensive (applications to local patent offices in the Western Balkans in particular can be expected to incur a considerably lower cost than an application to the EPO) (Hörlesberger 2006).

The situation regarding Intellectual Property (IP) protection in Montenegro has been quite difficult to comprehend, even prior to the separation from the State Union of Serbia and Montenegro. According to Kathryn Szymczyk, director of the Montenegrin branch of an international legal office specialising in IP protection, both states had their own legislatures and, to some extent, different laws and

institutions. In 2005, Montenegro adopted its own "Law on the Enforcement of Intellectual Property Rights" (Official Gazette of Montenegro No.45/2005), but nevertheless continued to enforce the same laws as Serbia with respect to IP rights generally (SD Petosevic 2006). After its separation from Serbia in June 2006, the Montenegrin Ministry of International Economic Relations and European Integrations took the stance that applicable laws that were in force in the union of Serbia and Montenegro would retain legal continuance until suitable laws are passed in the Republic of Montenegro. According to legal experts, this means that until a new Patents and Trademarks Office (PTO) is established, all IP rights validly registered in Serbia, both before and after the dissolution of the Union, will also be enforceable in Montenegro. Furthermore, a likely outcome is that once a Montenegrin PTO is established, a revalidation period will be permitted whereby holders of IP rights in Serbia will have 6-12 months to revalidate their existing IP rights in Montenegro. It must be stressed, however, that the Republic of Montenegro does have its own Law on Enforcement of the Legislation that Regulates Intellectual Property Rights which gives various government agencies, such as Customs and Market Inspectorate, the authority to detain and seize infringing goods. This means that applications for the enforcement of IP rights must still be made separately for Montenegro, even though such applications will have to be based on IP rights registered in Serbia (SD Petosevic 2006).

Patent applications originating from Montenegro have so far been submitted to the Federal Institute for Patents in Belgrade, which was in charge of patents in the State Union. The number of patents administered in Montenegro, as reported by the Federal Institute for Patents, has been relatively low in recent years: 4 in 2002, and 1 in 2003 (Uvalic 2006). As for patents granted by the EPO, it is obvious that even Croatia, the best performing country in Western Balkans region (with 15 patents in 2003), plays a very limited role as an applicant country for EPO patents. In 2003, a total of 62,873 patents were granted by the EPO, of which, 31,027 were granted to EU countries, and only 4 to Serbia and Montenegro (Hörlesberger 2006).

#### **4.2 Publication Activity in Montenegro**

Publishing activities in Montenegro are difficult to estimate due to the absence of a mutual categorisation system among libraries. This results in a lack of categorisation of scientific publications (except for Masters and Doctoral theses and some monographs). Most monographs are in the field of humanities, with around 95 % of all published monographs in the disciplines of Economics, Law and National History, while less than 5 % of catalogued publications are in the fields of Engineering and Natural Sciences. However, although the engineering faculties are among the oldest in Montenegro, a large number of their publications are not catalogued for the reasons mentioned above.

Table 4.2: Scientific Output – Number of Books and Brochures in Montenegro, 2001 (Monstat for (Uvalic 2006, p. 77))

	<b>Books</b>	<b>Brochures</b>
General	3	-
Philosophy, Psychology	1	-
Religion, Theology	1	-

Social Science	38	9
Mathematics, Natural Science	2	-
Applied Science, Medicine, Techniques	4	2
Arts	9	1
Literature	38	2
Geography, Biography, History	17	1
<b>Total</b>	<b>113</b>	<b>15</b>

## 5 National R&D Strategy and Legal Framework

Most S&T policies in the Western Balkans region are characterised by their encouragement of sustainable support for basic research at universities and research institutes, for the development of human resources, and for cooperation within the framework of the European Union's programmes for RTD and joint research programmes with the European Science Foundation and bilateral agreements (Dall 2006). In technology policy, emphasis is placed on linking research institutions as sources of knowledge with industry and SMEs, and encouraging the establishment and functioning of intermediary institutions – although the practical success of such institutions is still being questioned (Kobal 2005).

This chapter discusses the legal framework for national R&D strategies, presents the main documents reflecting these strategies, and highlights the main fields for intervention and the research priorities in Montenegro.

### 5.1 *Legal Framework for the National R&D Strategy*

A legal framework is indispensable in the organisation of R&D institutes, innovation infrastructure and programmes that provide grants to research organisations and innovative companies. Most commonly, as is the case in Montenegro, S&T and higher education laws are prepared separately, for example, the Montenegrin Law on Higher Education was adopted in October 2003 and the Law on Scientific Research Activities in November 2005. The Law on Higher Education was adopted with objectives of eliminating rigidity from university structure, preventing brain-drain, complying with EU standards and enabling full participation in mobility schemes (Dall 2006). This law was adopted on the basis of the government's Strategic Plan of Education Reform implemented in January 2003, in line with the objectives of the Bologna process. Subsequently, the government announced that it will prepare a strategy to define the annual budgetary increase allocated to R&D up until 2010. The main strategic aim of this statute was to create a legal basis for the future creation of a knowledge-based society and a gradual increase in the R&D budget.

The overall goal of the law is to give higher education institutions in Montenegro maximal autonomy in their activities, particularly in the academic field. Mediation from the state shall be kept to a minimum, except when requested for the purpose of protecting public interest. A further aim is to enable the university to educate young people in compliance with the new European standards, to be

citizens in a democratic society and to be a qualified workforce in the European labour market.

The law also prescribed the adoption of a University Statute within a maximum of three months after adoption the law; this was successfully carried out in January 2004. The Statute, contrary to the law, needs to clarify, and specify more thoroughly the organization of the university, the structure of the Board and the Senate etc. The new Statute and other by-laws and regulations have already been approved (Skuletic 2006b).

According to the law, the Ministry of Education and Science is, at the time of writing this report, preparing a draft on the regulation of HE financing. Current discussions are oriented towards the inclusion of a social dimension with regard to tuition fees (Skuletic 2006b).

Table 5.1: Important Laws in the Legal S&T Framework of Montenegro (Dall 2006)

Law on Scientific Research Activities	This new law was adopted in November 2005 and replaced the one adopted in 1992.
Law on Higher Education	This law was reformed in 2003 in order to eliminate rigidity from the university structure, prevent brain-drain, comply with EU standards and enable full participation in mobility schemes.
Laws on IP Protection: Law on Enforcement of IP Rights, Patents Law, Copyrights and Related Rights Law, Trademark Law, Law on the Legal Protection of Designs and Law on the Protection of Integrated Circuit Topographies	Montenegro adopted its own law on the enforcement of IP Rights in 2005. However, applicable laws that were in force in the Union of Serbia and Montenegro have legal continuance until suitable laws are passed in the Republic of Montenegro. This means that until a new PTO is established, all IP rights validly registered in Serbia, both before and after the dissolution of the Union, will also be enforceable in Montenegro.

Progress has also been made in Montenegro's intellectual property legislation. As mentioned in chapter 5.1, the situation regarding IP protection in Montenegro has been quite difficult to comprehend, as the country has been using in parallel, both its own law ("Law on Enforcement of Intellectual Property Rights" adopted in 2005), as well as the laws adopted on the federal level, through the Assembly of Serbia and Montenegro (Patents Law, Copyrights and Related Rights Law, Trademark Law, Law on the Legal Protection of Designs and Law on the Protection of Integrated Circuit Topographies, all December 2004). These laws were adopted in order to fully harmonise regulations with the requirements of the World Trade Organisation (WTO) and the TRIPS Agreement (Trade Related Aspects of Intellectual Property Rights), as well as in accordance with related EU regulations. Currently, the laws in question maintain legal continuance in Montenegro until the country adopts its own laws in this field, according to a decision made by the Montenegrin Ministry of International Economic Relations and European Integrations, (SD Petosevic 2006).

Despite the obvious efforts being made, it must be stressed that enforcement of laws dealing with intellectual property is causing many difficulties in practice. Due to disharmony, limited competence and inadequate coordination between the authorities responsible for the enforcement of laws (courts, public prosecutors, police, customs, market inspectors etc.), the protection of intellectual property rights is not efficient enough at present (Yusurvey 2006).

## ***5.2 Main Documents Reflecting National Strategies for Research, Development and Innovation***

Underdevelopment of S&T governance in Montenegro still represents an important structural problem. There is a certain dynamic present in the government's undertakings, allowing a variety of formal and informal institutions, mechanisms and procedures for managing S&T infrastructure, designing, delivering, selecting and evaluating S&T policy programmes, and specifying and implementing standards. However, differences between the functions described in the laws and the actual implementation can often be found; some institutions do not function properly or merely exist 'on paper'. Innovation should not be limited only to higher education, as is often the case in the Western Balkans region, rather it should penetrate other relevant policies, such as competition, enterprise, research, finance and taxation policy. Such a shift in focus from science, to a more comprehensive innovation system perspective is still lacking in the country under study, and corresponds to the general situation in the region (Dall 2006).

The Ministry of Education and Science of Montenegro started the reform on higher education in the year 2000 as a consequence of various, equally important, factors influencing significant policy changes in society and economy. In 2003, the government of Montenegro adopted the Law on Higher Education, in line with the objectives laid out in the Strategy Plan for Educational Reform. The new Strategy Plan for Educational Reform in Montenegro for the period 2005-2009 was adopted by the Government of Montenegro in 2005. Among other goals, the Strategy Plan envisages the development of educational infrastructure, the introduction of ICT into the education system, curricula modification etc. (Government of the Republic of Montenegro 2005). Furthermore, in 2003 the Government of Montenegro adopted a strategy for introducing ICT into Montenegro's education system (Ministry of Education and Science of Montenegro 2003). It is reasonable to expect further adoption of government strategy plans in the near future in order to keep up with the positive dynamics of the work being done so far.

## ***5.3 Main Fields of Intervention and Research Priorities***

A key challenge for all Western Balkan countries is the process of the transition to a market economy is to create stable and favourable conditions for economic growth. Against this background, innovation policy has to enlarge its scope from the focus on research to a broad productivity agenda (Dall 2006). As stated by Slavo Radošević, innovation policy as such has only recently re-emerged in the

Western Balkans, after having been reduced to a secondary role during the transition process. *"In order to be effective, innovation policies in the CEECs should recognise the structural weaknesses of their individual innovation systems. This will require a search for country-specific solutions, as opposed to the rather imitative mode that has so far prevailed"* (Radosevic 2005). Investments in R&D and high-tech orientation are regarded as the dominant paradigm in innovation policy.

Serious long-term structural problems that affect the S&T sector need to be discussed in order to assure further development. Amongst these structural problems are budgetary constraints and public debt, a generally low level of development, widespread unemployment, poverty and massive migrations, pointing to the need for industrial restructuring in largely agricultural-based, de-industrialised economies (Uvalic 2005). Due to the overall lack of resources, prioritisation is of the utmost importance and research orientation has to be steered towards the economic and social needs of the present in order to make provision for the future. International programmes need to support foresight studies and the process of prioritisation, as simply focusing on the RTD Framework Programme or imitating the strategies of other countries will not bring the desired results (Uvalic 2006).

Priority setting in the S&T sector is intended to facilitate the efficient performance of certain identified S&T fields through a predictable allocation of critical-size funds. The need to define thematic S&T disciplines and fields has been recognised by all countries. Research priorities in general are principally Information and Communication Technologies, Life Sciences, research on Agribusiness and Biotechnology, Genomic research, Environmental and Materials research, and research on renewable energies and sustainable development as well as water management, transport, aerospace research, humanities and social sciences, and research in SMEs. The level of specification varies from country to country. A great deal has been achieved in terms of institution and strategy development. However, some papers remain generally superficial, and many statements have more to do with paying lip service than real policy implementation and related operations. The level of aggregation seems too broad and thus, goal-oriented interventions will be difficult to identify and are unlikely to generate the expected benefit. Much remains to be done, including the implementation of national foresight studies in order to support the prioritisation process. It would also be worth considering a complementary regional comparative foresight exercise to assist the diverse national attempts (Uvalic 2006).

In Montenegro, the main orientation of R&D policy is supporting basic scientific research and applied research. The priority tasks of the Ministry of Education and Science in the field of research are (Ministry of Education and Science of Montenegro 2004):

- increasing stability in financing the existing research potential, paying special attention to research at higher education institutions (universities)
- professional assessing research groups
- modernising research equipment and other infrastructure

- increasing international cooperation in science
- ensuring that a higher percentage of the population receive higher education
- increasing post-graduate education of junior researchers with emphasis on PhD students
- providing scientific publications and participating in conferences

The Ministry of Education and Science uses two main programmes: the Human Resource Development Programme and the Scientific Research Programme. The main priorities of the Scientific Research Programme include biotechnology, marine biology, tourism, energy efficiency, telecommunications, computerisation and research on environmental protection, materials-related technologies and health care (Uvalic 2006). Due to its position as the dominant institution, the University of Montenegro is the prime target of the reform process. However, the stimulation of enterprises and the creation of favourable environments for industry and SMEs are also considered to be crucial. In order to steer the changes in a synergetic way, a system of priorities, supported by adequate and sound economic policy measures, needs to be developed (Ministry of Education and Science of Montenegro 2005).

Table 5.3: Thematic Priorities in Montenegro ((Ministry of Education and Science of Montenegro 2005) according to (Dall 2006))

General research priorities focus on:

- improvement of the quality of life and communication infrastructure,
- Information and Communication Technologies (ICT),
- environmental technologies and water management,
- materials research,
- research on agribusiness and biotechnology.

In addition, it would be recommendable for the country to develop a sustainable strategy, also taking into account regional and European dimensions. Although the last document related to R&D strategy adopted by the government dates back to 1995 and is no longer effective, the new Law on Scientific-Research Activities (2005) does envisage the preparation of an R&D strategy regarding the creation of a knowledge-based society (Uvalic 2006). Furthermore, foresight and the identification of innovation capacities will help to develop policies and a long-term strategy in a regional context. Continuous raising of awareness among the public and politicians about the relevance of RTD is also important, and a dialogue between the economy, academia and the administration will provide the basis for developing a science policy that is in line with economic policies and priorities. Benchmarking and evaluation can also help to improve the performance of research institutions and to concentrate capacities in priority areas in coherence with regional development and European integration. A close dialogue with important foreign stakeholders with shared experiences is inevitable, but since there are no ready-made solutions, simply imitating policy approaches is unlikely to produce the desired results (Dall 2006).

## 6 Summary and Draft Conclusions

After the dissolution of the Socialist Federal Republic of Yugoslavia (SFRY), Montenegro faced a turbulent political decade, followed by a long period of international sanctions and isolation, which prevented any significant progress in the country. Finally, on June 3, 2006, Montenegro decided to hold a referendum of independence from the State Union of Serbia and Montenegro, taking on responsibility for its future status and reputation in the international political arena. The European Union recognised the legitimacy of the whole process and instantly commenced a procedure to continue separate negotiations with Montenegro on the Stabilisation and Association Agreement, which were temporarily terminated in the previous year.

There is a general conviction that in the 1990s, the SFRY had a more favourable starting position in terms of matching Western European standards than the former state socialist countries under communist hegemony in Central and Southeast Europe. The scientific and technological trajectories of the former SFRY seemed close to Western European developments and interaction between these two politically contrasting regions continued, both in terms of personal mobility and institutional cooperation. Unfortunately, the collapse of the SFRY and the resulting armed and civil conflicts hindered the necessary modernisation of S&T in the countries of the former SFRY (with the exception of Slovenia) in 1990s. All of these complex reasons have contributed to the loss of comparative advantage of the new countries (successors of the SFRY), which have missed the opportunity to carry out necessary adaptations and fine-tuning. The current situation can be described as critical, which is unequivocally demonstrated by the input and output figures of the national innovation systems. R&D was one element of the system which was most negatively affected during the transition and crisis period of the last 15 years. The research budgets in some of the countries in the region (including Montenegro) are below critical threshold or have decreased significantly. Modernisation of the institutional and structural set-up of the national innovation system is long overdue, although a number of attempts have been initiated since the turn of the millennium. Links to other subsystems, such as education, the regional economy, and the financial and banking system, are generally still underdeveloped (Schuch 2006).

International cooperation has been of tremendous importance and value to Montenegro. Serious efforts by the European Commission, Austria, France, Germany, Greece, Slovenia and others have been initiated to overcome the critical situation caused by the decade of isolation and underdevelopment. In this respect we can highlight the EU's "Balkan Countries Action Plan in S&T", formulated under the Greek EU Presidency in 2003, the establishment of the Southeast European ERA.NET initiated by Austria in 2004, and the implementation of a 'Steering Platform' for the Western Balkan countries under Austria's Presidency of the EU in 2006, as projects with the highest relevancy in the recovery of the RTD sector in the region, including Montenegro (Schuch 2006).

One of the positive features in the countries of the Western Balkans, in comparison with some other developing regions, is a fairly sound human capital base, with an absorptive capacity central for learning, assimilating and using knowledge developed elsewhere. At the same time, however, the relative loss in quality at all levels of the education system is worrying. Development and higher education cooperation policies have recognised this threat and contribute material and immaterial resources to safeguard this vital source of economic and social development. Smaller countries, like Montenegro, are particularly dependent on technological and organisational knowledge and know-how generated abroad, however they can only access it using internationally up-to-date expertise which enables them not only to acquire, but also to generate and apply the knowledge and know-how themselves. Innovation is thus a process that involves more than just capable individuals. Bridging activities between companies and organisations of different sub-sectors of the innovation systems (such as education, regional development policy, S&T, and financial and regulatory systems) are of the utmost importance, as are bridging activities between more developed and less developed regions of knowledge. Interaction and interdependence are the most fundamental characteristics of this approach (Schuch 2006).

Although the general assessment shows that the research system in Montenegro has substantial potential, it is still troubled by the inappropriate treatment of the research institutions, an unfavourable structure, weak interaction with the business sector and insufficient linkages with the education and research systems of other countries. Over the course of years, science, scientists and scientific research have been marginalised, while R&D has not been among the key priorities and a clear longer-term strategy in this area is still absent. According to Milica Uvalić, the links between business enterprises, universities and research institutes need to be improved and efforts should be made to accelerate the implementation of laws and related measures (Uvalic 2006).

In addressing these complex issues, the government will have to face the challenge of finding the right balance between restrictive economic policy, which is clearly necessary for macroeconomic stabilisation purposes, and other types of policies with long-term effects, which can contribute to raising economic competitiveness, e.g. through increased investment in human capital, and increased spending on R&D and on education. It would also be desirable to address the issue of a longer-term strategy of R&D for all Western Balkan countries in a regional context. Furthermore, there is a need to attract more Foreign Direct Investment (FDI) by further improving the business environment and thus decreasing the risk associated with investment, which also ought to facilitate the transfer of modern technologies and know-how (Uvalic 2006).

Sreten Škuletić, president of the Commission for scientific-research activities and international cooperation at the Montenegrin Ministry of Education and Science has assessed the overall situation in the country regarding RTD as a reflection of the general situation in society at this moment. The current economic situation, accompanied by severe under-financing of science gives little hope for any significant improvements in the near future. Allocated financial sources are hardly sufficient to cover basic survival needs, let alone create a platform for further development. Nevertheless, he believes that the situation could gradually

improve by pursuing continuous efforts and investments in the RTD sector, accompanied by reforms in the field of higher education in line with the Bologna objectives and following processes (Skuletic 2006a). This is also a general assessment by the Montenegrin scientific Diaspora, who wants to see the positive changes in the country continue with an accelerated pace, but also reminds us that the most significant change required, is a change in the way science is viewed by society, in particular, the need for a greater awareness of the importance of science for the existence and development of society as a whole.

## 7 References

Bonas, G. (2006) Update on IPA Initiative. "see-science.eu" eJournal (issue fall 2006). Available from: <http://www.see-science.eu/news/332.html>.

CORDIS Community Research and Development Information Service (2003a): Action Plan of EU - Balkan countries in the sector of Research and Technological Development (RTD). Available from: <http://cordis.europa.eu/greece/press45.htm>, accessed 12.09.2006.

CORDIS Community Research and Development Information Service (2003b): Shared Vision of the EU: "Balkan countries Cooperation in Science and Technology". Available from: [ftp://ftp.cordis.europa.eu/pub/greece/docs/eu\\_balkan\\_sharedvision\\_030627.pdf](ftp://ftp.cordis.europa.eu/pub/greece/docs/eu_balkan_sharedvision_030627.pdf), accessed 12.09.06.

Dall, E. (2006): National R&D Strategies of the Various Countries in Focus. In: Research and Development in South East Europe. Gesellschaft zur Förderung der Forschung (ed.).

European Commission DG Joint Research Centre (2004): Joint Research Centre. Available from: [http://www.jrc.cec.eu.int/default.asp@sidsz=more\\_information&sidstsz=searchjrc.htm](http://www.jrc.cec.eu.int/default.asp@sidsz=more_information&sidstsz=searchjrc.htm), accessed 12.09.2006.

European Commission DG Enlargement (2006): Political Profile of Montenegro. Available from: [www.ec.europa.eu/enlargement/montenegro/political\\_profile\\_en.htm](http://www.ec.europa.eu/enlargement/montenegro/political_profile_en.htm), accessed 06.09.2006.

European Patent Office (2006): How to get a European Patent. Guide for applicants. Available from: [http://www.european-patent-office.org/legal/guiapp1/pdf/g1en\\_net.pdf](http://www.european-patent-office.org/legal/guiapp1/pdf/g1en_net.pdf), accessed 24.07.06.

Fischer, M. (2006): The Input Side of the National Innovation Systems. In: Research and Development in South East Europe. Gesellschaft zur Förderung der Forschung (ed.).

Government of the Republic of Montenegro (2005): Strategy Plan for the Educational Reform in Montenegro for the period 2005-2009. Available from: <http://www.gom.cg.yu/files/1147963662.pdf>, accessed 04.12.2006.

Hörlesberger, M. (2006): The Output Side of the National Innovation Systems. In: Research and Development in South East Europe. Gesellschaft zur Förderung der Forschung (ed.).

Kobal, E. (2005): Elements of National Science and Technology Policy. In: Modernisation of Science Policy and Management Approaches in Central and South East Europe. Edvard Kobal, Slavo Radosevic (ed.): IOS Press: 13-18.

Kutlaca, D. (1998): The Science and Technology System in the Federal Republic of Yugoslavia. Available from: <http://www.sussex.ac.uk/Units/spru/publications/imprint/steepdps/43/steep43.html>, accessed 03.10.2005.

Kutlaca, D. (2005a): Science and Technology in Serbia and Montenegro. In: Modernisation of Science Policy and Management Approaches in Central and South East Europe. Edvard Kobal, Slavo Radosevic (ed.): IOS Press: 52-60.

Kutlaca, D. (2005b): Statistical Bulletins : "Institutions of Scientific-Technological Development", Montenegro.

Kutlaca, D. (2005c): Statistical Bulletins: Institutions of Scientific - Technological Development, Serbia.

Ministry of Education and Science of Montenegro (2003): Recommending a Strategy on Education reform in Montenegro. Available from: [http://www.see-educoop.net/education\\_in/pdf/support-edu-monte-5-yug-mon-enl-t05.htm](http://www.see-educoop.net/education_in/pdf/support-edu-monte-5-yug-mon-enl-t05.htm), accessed 11.09.06.

Ministry of Education and Science of Montenegro (2004): Montenegro in Europe. Available from: <http://www.jrc.cec.eu.int/enlargement/events/20041026/presentations/koprivica-s&t-montenegro.pdf>, accessed 12.09.2006.

Ministry of Education and Science of Montenegro (2005): Questionnaire for SEE-ERA.NET - Montenegro.

Ministry of Education and Science of Montenegro (2006): Announcement of the Pilot Joint Call. Available from: <http://www.vlada.cg.yu/minprosv/index.php?akcija=vijesti&id=17528>, accessed 04.12.2006.

Montenegrin Academy of Sciences and Arts (2005): Montenegrin Academy of Sciences and Arts. Available from: [www.canu.cg.yu/opste.htm](http://www.canu.cg.yu/opste.htm), accessed 08.09.2006.

Radosevic, S. (2005): Transformation of Research and Innovation Policy in New EU Member and Candidate Countries: What Can We Learn from It? In:

Modernisation of Science Policy and Management Approaches in Central and South East Europe. Edvard Kobal, Slavo Radosevic (ed.): IOS Press: 29-38.

Roland Berger Market Research (2004): The Cost of Patenting.

Schuch, K. (2006): Conclusions and Recommendations for Policy Interventions. In: Research and Development in South East Europe. Gesellschaft zur Förderung der Forschung (ed.).

SD Petosevic (2006): Intellectual Property Protection in Montenegro. Available from: [www.petosevic.com/offices/montenegro](http://www.petosevic.com/offices/montenegro), accessed 13.09.06.

SEE-science (2006) General Info: What is IPA? eJournal of the SEE-science(fall 2006). Available from: <http://www.see-science.eu/ejournal/519.html>.

Skuletic, S. (2006a): Less Money, Less Science. Available from: [www.prosvjetnirad.cg.yu/broj3-4\\_06g/02.htm](http://www.prosvjetnirad.cg.yu/broj3-4_06g/02.htm), accessed 06.09.06.

Skuletic, S. (2006b) Review of the S&T Report in December 2006. see-science.eu.

The Government of Montenegro (2003): The Strategy of Introducing ICT into the Education System of Montenegro. Available from: [www.see-educoop.net/portal/id\\_monte.htm](http://www.see-educoop.net/portal/id_monte.htm), accessed 07.09.06.

UNESCO & Hewlett Packard (2003): Piloting Solutions for Alleviating Brain-drain in BiH, Croatia, Montenegro and Serbia. Available from: [www.unesco-hp.cg.ac.yu](http://www.unesco-hp.cg.ac.yu), accessed 11.09.2006.

University of Montenegro (2006): Bulletin of the University of Montenegro, No. 211, 15.11.2006.

USAID (2005): Strategy Statement - The Republic of Montenegro. Available from: [http://www.usaid.org.yu/upload/documents/Budget/USAID\\_Strategy\\_for\\_Montenegro\\_Public\\_English.pdf](http://www.usaid.org.yu/upload/documents/Budget/USAID_Strategy_for_Montenegro_Public_English.pdf), accessed 01.12.2006.

Uvalic, M. Regional Bureau for Science in Europe (ROSTE) UNESCO Office in Venice (2005): Science, Technology and Economic Development in South Eastern Europe. Available from: UNESCO-ROSTE, Venice.

Uvalic, M. (2006): National Systems of Research and Development in the Western Balkan Countries.

WUS Austria World University Service (2006): What is WUS Austria. Available from: [www.wus-austria.org](http://www.wus-austria.org), accessed 30.08.2006.

Yusurvey (2006): Protection of Intellectual Property in Serbia & Montenegro. Available from: <http://www.yusurvey.co.yu/products/ys/showSummaryArticle.php?prodId=2060&groupId=6258>, accessed 06.08.06.



## 8 List of Acronyms

BERD - Business Sector Expenditure on R&D

CARDS - Community Assistance for Reconstruction, Development and  
Stabilisation

CEEC - Central and Eastern European Countries

CEI - Central European Initiative

CERN - European Organisation for Nuclear Research

CEP - Centre of Excellence Projects

CG - *Crna Gora* - Montenegro

CIS - Centre of Information System

COBISS - Co-operative Online Bibliographic System & Services

CORDIS - Community Research & Development Information Service

COST - Co-operation in Science and Technology

DAAD - German Institute for Academic Mobility

DG - Directorate General (in the European Commission)

EC - European Commission

ECTS - European Credit Transfer System

ERA - European Research Area

ERA-NET - European Research Area Network

EU - European Union

FP - Framework Programmes

FP6 - Sixth EU Framework Programme for R&D

FP7 - Seventh EU Framework Programme for R&D

FTE - Full Time Equivalent

EPC - European Patent Convention

EPO - European Patent Office



FDI - Foreign Direct Investment

FRY - Federal Republic of Yugoslavia

GÉANT - a multi-gigabit pan-European data communications network

GERD - General Expenditure on R&D

GDP - Gross Domestic Product

GOVERD - Government Sector Expenditure on R&D

HC - Head-Count

HE - Higher Education

HERD - Higher Education Sector Expenditure on R&D

HP - Hewlett Packard

IAEA - International Atomic Energy Agency

ICT - Information and Communication Technology

ICTY - United Nations International Criminal Tribunal for the former Yugoslavia

INCO - International S&T cooperation of the European Union

IP - Intellectual Property

IPA - Instrument for Pre-Accession Assistance

ISSP - Institute for Strategic Studies and Prognoses

IS2WEB - FP6 project "Extending Information Society Networks to the Western  
Balkan Region"

IST - Information Society Technologies (Sub-Programme in FP6)

JRC - Joint Research Centre

MASA - Montenegrin Academy of Sciences and Arts

MEIS - Montenegrin Educational Information System

MoES - Ministry of Education and Science

MONSTAT - Statistical Office of the Republic of Montenegro

MREN - Montenegrin Research and Education Network

NATO - North Atlantic Treaty Organisation

NIP - Networking Infrastructure Projects

PJC - Pilot Joint Call of the SEE-ERA.NET project

PTO - Patents and Trademarks Office



R&D - Research and Development

RTD - Research and Technological Development

SAA - Stabilisation and Association Agreement

SAP - Stabilisation and Association Process

S&E - Science and Engineering

SEE - South East Europe

SEE-ERA.NET - FP6 project "Southeast European Era-Net"

SEE-INNOVATION - FP6 project "Facilitating Innovation for ICT SMEs in South Eastern Europe"

SEE-SCIENCE.EU - FP6 project "Information Office of the Steering Platform on Research for Western Balkan Countries"

SEEREN - FP6 project "South Eastern European research and education networking"

SFRY - Socialist Federal Republic of Yugoslavia

SME - Small and Medium Size Enterprise

S&T - Science and Technology

TEMPUS - Trans-European Mobility Scheme for University Studies

TRIPS - Trade Related Aspects of Intellectual Property Rights

UN - United Nations

UNDP - United Nations Development Programme

UNECE - United Nations Economic Commission for Europe

UNESCO - United Nations Educational, Scientific and Cultural Organisation

UNIDO - United Nations Industrial Development Organisation

USAID - United States Aid

UoM - University of Montenegro

WB - Western Balkans

WBC - Western Balkan country/countries

WTO - World Trade Organisation

WUS - World University Service

ZAMTES - Republic Agency for International Scientific, Educational, Cultural and Technical Co-operation of Montenegro



### **The Project**

The Information Office of the Steering Platform on Research for Western Balkan Countries (*see-science.eu*) acts as a source of high quality targeted information on research in the Western Balkan countries (WBCs) by supporting the Steering Platform through a regular eJournal, analytical studies and reports and directories.

The Information Office contributes to a dialogue on S&T issues between the EU and the Western Balkan countries and the integration of the research and innovation systems of the WBCs into the European Research Area (ERA).

*see-science.eu* is a project (Contract Number: 031770) co-funded by the European Community's Programme for Specific International Scientific Cooperation Activities (INCO) under the 6th Framework Programme for Research and Technological Development (2002-2006).

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### **Reviews and Contributions**

The readers are invited to contribute to the development of the report. It is planned to update it on a continuous basis and to publish the results in a book in the end of 2007. Please send your remarks to Ms. Elke Dall at [dall@zsi.at](mailto:dall@zsi.at)