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RESEARCH COOPERATION WITH THE WESTERN BALKANS:

A TOOL TO FACILITATE INTEGRATION

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Directorate-General for Research
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FOREWORD

It is a great pleasure for me to present this brochure on research cooperation between the European Union (EU) and the Western Balkans.

Much has already been written about this part of Europe, and in particular about its eventful history and the many attempts to bring peace and stability to the region. Of course alongside these words, there has been a lot of action. By engaging in research together, I firmly believe that we contribute to the highly prized objectives of peace and stability, while pursuing a better future for the citizens of the region and the Union.

I also believe that science and research should not be constrained by geography, history or politics, and in this spirit I committed, at the launch of the Steering Platform on Research in Vienna in June 2006, to open widely the doors of the European Research Area (ERA) to the Western Balkans. A strategy was established to facilitate this and in turn to support the European perspective offered to the Western Balkans.

The most important element of this strategy was encouraging the Western Balkans to become associated to the EU Seventh Framework Programme for Research and Technological Development (FP7) because, by engaging together in research we learn from each other and understand each other better.

Research cooperation with the Western Balkans is also an obvious priority from another point of view: it is a real bonus for Western Balkan countries with the ambition of joining the EU. As associated countries to FP7, the Western Balkans will become familiar with the EU decision-making process and with broader European values. This experience can only help them along the road to EU integration.

The second element of the strategy was therefore designed to facilitate, where we can, the take-up of the ERA actions and objectives. This is why it is important for each Western Balkan country to develop a national strategy on research, place research high on the political agenda and progressively increase investment in research. Each country must ensure that it has sufficient researchers and the infrastructure necessary to contribute to, and benefit from, the free flow of knowledge in Europe, a flow we call the 'fifth freedom'.

Of course we are fully aware that strengthening research capacity is costly and this is why it cannot be done in isolation. The third element of our strategy aims at bringing together all stakeholders committed to strengthening science and technology (S&T) capacity in the Balkan region. Synergies are necessary between the actions at national level and those of the EU, in particular with the Instrument for Pre-Accession Assistance (IPA) and the Research Framework Programmes and those of other stakeholders like the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank and the European Investment Bank (EIB).

Finally, although the Western Balkans is a highly diverse region, its countries share many challenges and problems. This is why I also strongly support the development of the regional dimension of research cooperation – just as we are doing in the ERA. The role and support of the Regional Cooperation Council (RCC) in this respect is very much to be welcomed.

This brochure should show just how much has already been achieved, even beyond my expectations, over the last decade. But ERA is work in progress and so is the EU. We need to increase our knowledge and put it to work by joining forces and ideas together. Some suggestions on how to face the challenges ahead of us are made at the end of this brochure.

Janez Potočnik
European Commissioner

INTRODUCTION

This brochure provides an overview of the ongoing research cooperation between the EU and the Western Balkans. It also explains why we engage in research with this region and how we do it.

The political commitment to give a European perspective to the Balkan region goes hand in hand with increased support for research cooperation: this is illustrated both in the section on research as a tool for facilitating future integration into the ERA, and in the section on research cooperation.

The real impetus for engaging in research cooperation with the Western Balkan countries came from the European Council meeting in Thessaloniki in June 2003. There, heads of state and government reiterated that the future of the Balkans lies within the EU. Ministers of science also endorsed a 'Shared Vision' and a 'Science and Technology Action Plan' aiming at placing research cooperation with the then five Western Balkan countries high on the political agenda. Implementation of the Action Plan has led to increased research opportunities and support for capacity building.

The new approach to international cooperation under the Seventh Framework Programme for research, technological development and demonstration activities (2007-2013) (hereafter referred to as FP7), together with the ongoing process of future integration into the EU, required a more comprehensive dialogue. It was important that all stakeholders committed to the common objective of supporting research capacity in the Balkan region could meet and exchange ideas in one forum: in June 2006, Science and Research Commissioner Janez Potočnik, together with the Austrian EU Presidency, launched the Steering Platform on Research.

Since 1 January 2009, the Western Balkan countries (Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Montenegro and Serbia) have become associated to FP7. The association status brings increased research opportunities for each country, including familiarisation with EU research policy. Research entities in Kosovo ([1]) can also participate in FP7 as International Cooperation Partner.

As is evident from the country profiles in this brochure, the level of development in each Balkan partner is very different, as is their status vis-à-vis the EU. The differences are also reflected in the degree of participation under FP7. But there are many shared objectives, not least of which is making the transition to a knowledge-based society and becoming an EU Member State. For both objectives, increased research efforts are necessary. It is thus very important that each Western Balkan country designs a national strategy for research that will in turn facilitate integration into the ERA.

Strengthening research capacity is paramount to producing scientific excellence: this requires synergies between the different actors and instruments, including at regional level. The section on research cooperation offers a broad overview and a number of examples of projects that are relevant in this context.

The final section presents ideas on what lies ahead for the Western Balkans on the road to future integration into the ERA, and beyond as regards their accession to the EU.

[1] UNSCR 1244/1999.

EUROPEAN PERSPECTIVE FOR THE WESTERN BALKANS:

the way to increased research cooperation

Prior to the 1990s (specifically 1986 and 1991), research cooperation took place between the European Community and the then Republic of Yugoslavia. Although only a few projects were selected for funding, those that were successful underlined the strength of some of the region's research institutes and scientists.

At the beginning of the 1990s, all relations with the Balkan countries were interrupted, while a policy dialogue with Albania, which was still recovering from a long period of isolation, was only just beginning. But if the region was to recover from war and have the prospect of stability and prosperity, it became clear that the Balkans needed the offer of a European perspective.

This offer materialised at the Feira European Council of June 2000 in Portugal. There, the then five Western Balkan countries were assured that their future lies with Europe.

Later that same year, the Stabilisation and Association Process (SAP) was established with the intention of stabilising the region. It encouraged a swift transition to a market economy and promoted regional collaboration. The SAP set clear objectives and conditions on how to prepare the Western Balkan countries for the demands of accession to the EU. It codifies the political, financial and human resources commitments that the EU is willing to make in return for the reform actions expected by the Western Balkans. These reforms would enable each country to build the capacity necessary to adopt and implement EU law, as well as European and international standards. Forming links with the region in the research domain was on the political agenda from the very beginning for the politicians seeking to make the Western Balkans' European ambitions a reality.

The centrepiece of the SAP was the conclusion of a Stabilisation and Association Agreement (SAA) that outlines a far-reaching contractual relationship with each country in the Western Balkans. The SAAs introduced mutual rights and obligations in relation to the requirements for EU membership. They also promoted cooperation in research and technological development on the basis of mutual benefit. An SAA has now been concluded with all the Western Balkans and although some agreements still require ratification, all are being implemented. This implementation serves, simultaneously, as a means to identify the support measures needed and as a benchmark to measure readiness for complying with the EU *acquis communautaire* – all of the EU laws and practices accumulated so far.

Preparation for integration into European structures, and ultimately membership of the Union, were seen as a big challenge. They implied political and economic reforms and adoption of European standards. At the same time, it was established that the pace of progress is in the hands of the Balkan countries themselves. In this spirit, the European Council approved the Thessaloniki agenda for the 'Western Balkans: Moving towards European Integration' in June 2003.

The first bi-regional ([2]) EU/Western Balkans ministerial meeting on S&T also took place in Thessaloniki, Greece. A 'Shared Policy Vision and Action Plan' ([3]) was endorsed that would help the countries to prioritise their efforts in S&T and enable them to regain excellence in key strategic areas.

Today the Thessaloniki Action Plan on S&T remains valid, along with the vision behind it, which gave visibility to the Western Balkan region and highlighted the importance of cooperation on research to support economic reform. But a different approach to international cooperation under FP7 meant also that the way in which the Western Balkans' objectives were to be achieved changed too. Moreover, not only the way of addressing research cooperation with third countries changed: research at EU level became much

2 Under the Greek EU Presidency, the S&T Ministers of the 5 Western Balkan Countries, those of the 15 Member States, those of the then 6 candidate and accession neighbouring countries (Bulgaria, Cyprus, Hungary, Romania, Slovenia and Turkey) and the Commissioner for Research Philippe Busquin representing the Commission met to agree on a common policy for cooperation and partnership on S&T.

3 The Action Plan identifies the potential instruments for the implementation of the policy and provides the actions to be undertaken within the preparation of annual work programmes.

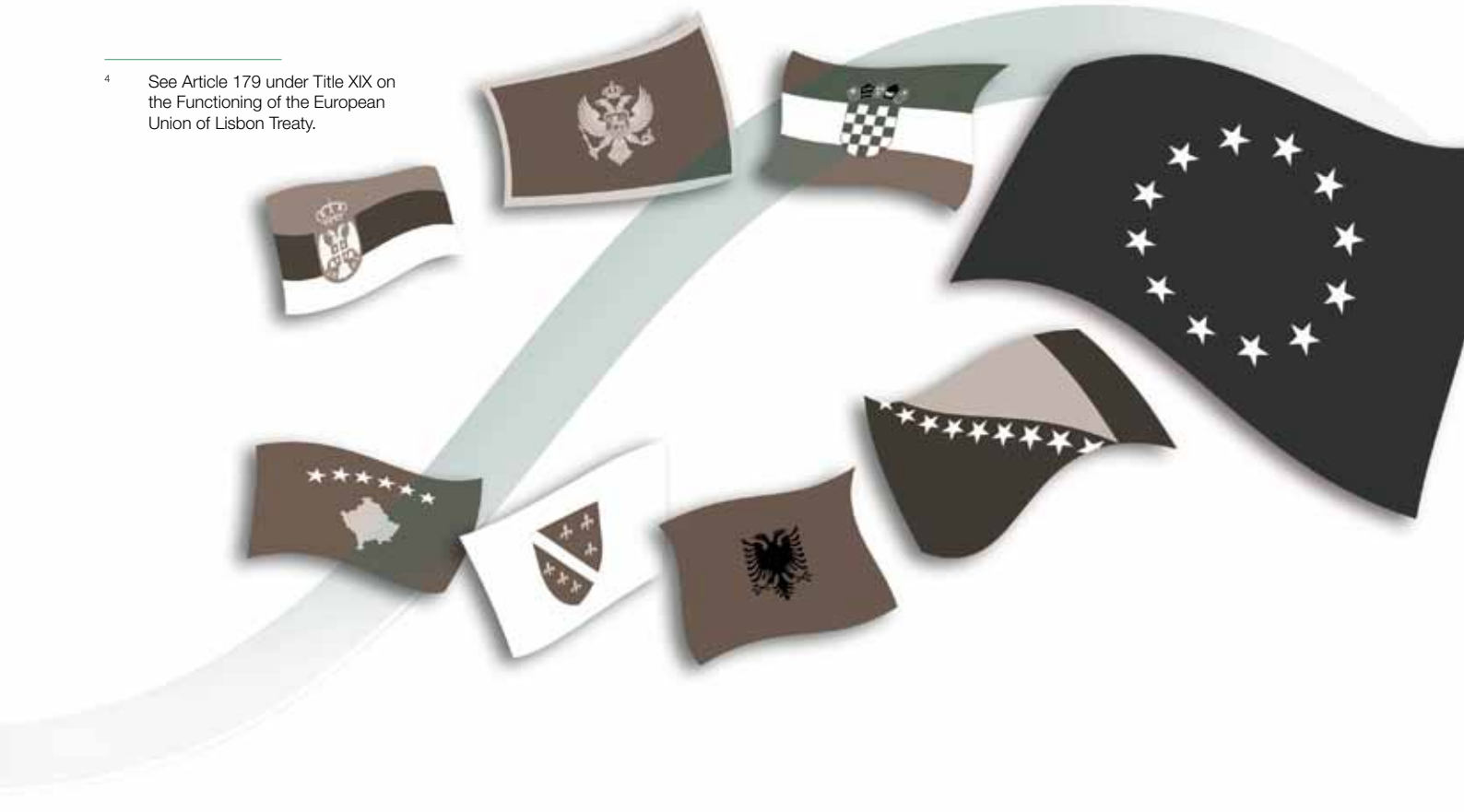
more important and evolved to a fully fledged EU policy. This is well illustrated by the fact that the ERA concept is now part of the Lisbon Treaty as the way to achieve the objective of strengthening the scientific and technological bases of the Union ([4]).

In Salzburg, Austria in March 2006, the EU ministers confirmed that the future of the countries of the Western Balkans lies within the EU and they called upon each country to take stronger ownership of the integration process. They also underlined the importance of regional cooperation as this is essential to long-term stability, economic development and reconciliation in the Western Balkans.

Taking into account the principles of further integration, ownership and regional cooperation, the European Commission, together with the Austrian EU Presidency, launched the Steering Platform on Research for Western Balkans in June 2006.

The Steering Platform was what can be called in research terms a spin-off of the EU's overall political commitment to the Western Balkans. It was designed to bring all stakeholders together to concentrate efforts so as to strengthen capacity building. The main task of the Steering Platform is monitoring the implementation of the strategy, with the future integration of the Western Balkans into the ERA being the ultimate goal.

All the Western Balkans are engaged in or are actively preparing for EU accession negotiations. This means that they have to adopt capacity building actions at national level and meet the requirements set in the Accession or European partnerships adopted by the EU Council. All the Western Balkans have now started designing an integrated research policy that should support economic reform and contribute to the overall ERA objectives.



4 See Article 179 under Title XIX on the Functioning of the European Union of Lisbon Treaty.

RESEARCH AS A TOOL:

facilitating integration into the European Research Area and the European Union

Relations between the EU and the Western Balkans intensified as soon as peace came to the region. As links became more formal, S&T was one of the key areas in which concrete arrangements for collaboration were outlined.

The reason is simple: research was recognised by all as an effective tool for easing the integration of the newly founded states into the EU. It brings results on three fronts: increased opportunities for research with the EU and at regional level, which in turn supports regional competitiveness; exposure to EU policymaking and the culture of European values; and preparing the countries for their implementation of EU *acquis,* in particular compliance with standards and technical requirements.

To achieve these objectives, it was important to have a forum where representatives from each Western Balkan country's ministry of science would sit together once again and interact with delegates from the EU. A forum would also allow contact with other stakeholders active in the region, who were equally, post-war, committed to supporting the Western Balkans in their quest to strengthen capacity as they travelled the road to the EU.

Bringing all stakeholders together was in itself a challenge. The Steering Platform thus took on symbolic importance in addition to its operational value.

Strengthening ties – the Steering Platform

The Platform was launched in Vienna in June 2006 by Commissioner Potocnik and the Austrian EU Presidency. Its goal was to strengthen research capacity in the Western Balkan countries and encourage all stakeholders to combine their actions and means so that this would be done in a coherent way. The members are representatives from all the Western Balkan countries, the EU Member States and countries associated to FP7, as well as the European Commission.

The Platform is open to other stakeholders and so far representatives of COST ([5]), EUREKA ([6]), UNESCO and the Regional Cooperation Council (RCC) have regularly attended meetings, while counterparts from the World Bank and Organisation for Economic Cooperation and Development (OECD) have participated as experts upon invitation. The co-chairs are a representative from the EU Presidency, a Western Balkan country and the European Commission. The Steering Platform is technically supported by the Information Office of the Steering Platform on Research for the Western Balkan countries, which in turn is part of the FP7 WBC-INCO.NET project.

The Platform's main activity is to exchange information and views on the research actions taken and on those still needed to strengthen research capacity and foster integration into the ERA. It is achieving this by mapping the scientific community, providing analysis on the state of research capacity in the Western Balkan countries, and presenting the ERA actions and guidelines so that the Western Balkans are informed about what is expected from them in terms of EU *acquis* on research policy. As research cooperation with the EU is very much determined by the Union's research funding instrument, significant attention has been awarded to Western Balkan participation in FP7.

Another important task for the Platform is seeking synergies with other programmes and organisations that could contribute to strengthening research capacity. For example, the Instrument for Pre-Accession Assistance (IPA) ([7]) – the EU's financing scheme to support and facilitate compliance with EU accession requirements – is being examined to see how it could be used to greater effect by the beneficiary countries in support of research capacity. With the World Bank, an

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5 European Cooperation in Science and Technology (see also http://www.cost.esf.org).

6 European-wide network for market-oriented industrial R&D (see also http://www.eurekanetwork.org).

7 Instrument for Pre-Accession Assistance (http://europa.eu/legislation_summaries/enlargement/ongoing_enlargement/e50020_en.htm).

Launching of Steering Platform at Austrian Federal Ministry for Education, Science and Culture in Audienszaal in Vienna on 26 June 2006.

exchange of views has already taken place on how its programme in support of education and human capital development could also engage in training researchers. Regular exchanges of information take place on the national programmes of the other Platform members and of other stakeholders.

Policy dialogue – Union for the Mediterranean

Four Western Balkan countries (Albania, Bosnia and Herzegovina, Croatia and Montenegro) became members of the Union for the Mediterranean when it was created in November 2008. The four are also now part of the Monitoring Committee for the Euro-Mediterranean Cooperation on Research (MoCo). This means participating in another policy dialogue body which allows for new networking possibilities and opportunities to cooperate with other Mediterranean countries.

Exposure to EU practices

Further to the Thessaloniki Agenda for the Western Balkans and in line with the Communication "Preparing for the participation of the Western Balkan countries in Community programmes and agencies" ([8]), Framework Agreements with all candidate and potential candidate countries on their participation in the community programmes were negotiated and adopted. Encouraging participation in the EU programmes is seen as a means to familiarise the countries and their citizens with EU policies and working methods, thus anchoring them more firmly to the EU and encouraging them on the path towards European integration.

More than 20 EU programmes, covering areas from education (e.g. the Erasmus and Tempus programmes) to transport (e.g. the Marco Polo programme) are open to participation from candidate and potential candidate countries. Participation in the EU programmes is subject to specific terms and conditions, including a financial contribution to the respective programme budgets.

In order to encourage participation in the Union's research framework programme, the first initiative that Commissioner Potocnik took was to offer fair and reasonable conditions that would render participation as an associated country possible. This offer was immediately taken up by Serbia, Croatia and the former Yugoslav Republic of Macedonia, followed by Montenegro, Albania and Bosnia and Herzegovina.

8 COM (2003) 748 final of 03/12/2003.

FP7 association

Country	Signature of Memorandum of Understanding	Entry into force
Croatia	13.06.2007	01.01.2007
former Yugoslav Republic of Macedonia	13.06.2007	01.01.2007
Serbia	13.06.2007	01.01.2007
Albania	17.12.2007	01.01.2008
Montenegro	25.01.2008	01.01.2008
Bosnia and Herzegovina	24.11.2008	01.01.2009

So far, the only EU programme to which all Western Balkan countries are associated is the research programme, which illustrates how important research cooperation is considered by the candidate and potential candidate countries.

Fundamentally, the status of 'association' allows research entities from each associated country to participate in the FP7 programmes with the same research opportunities, and subject to the same obligations, as entities established in the Member States. They no longer depend on calls targeting their country or region but can participate in all the calls provided they comply with the minimum participation requirements, which in most instances are three research entities from a Member State and/or associated country. To gain associated status, a financial contribution to the FP7 budget is required.

The 'association' status also entitles the associated country to nominate representatives as observers in the FP7 Programme Committees. This in itself is an extremely valuable opportunity as it allows them to become more familiar with how decisions are taken in practice, and to learn firsthand about research priorities and instruments at EU level. It also allows for increased networking possibilities with representatives from EU Member States and other countries associated to FP7, essential for research cooperation.

In order for associated countries to also familiarise themselves with EU research policy and the policymaking process, they have been invited to nominate observers for the Scientific and Technical Research Committee (CREST) and the other ERA governance bodies. In line with the Ljubljana process ([9]) and the ERA 2020 Vision ([10]), it was agreed at the Competitiveness Council in December 2008 that work on the ERA would be structured around five building blocks and governed by the following bodies, for which all Western Balkan countries have been invited to nominate delegate observers:

- single labour market for researchers, overseen by the Steering Group on Human Resources and Mobility (SGHRM);
- world-class research infrastructures overseen by the European Strategy Forum on Research Infrastructure (ESFRI);
- coordination of research programmes and joint programming, overseen by the Joint Programming Group (GPC);
- effective knowledge sharing, implemented by CREST sub-group on Knowledge Transfer;
- opening of the ERA to the world, overseen by the Strategic Forum on International Cooperation (SFIC).

Association to the Euratom Framework Programme is also a possibility, and is encouraged as a way of becoming more familiar with the EU's nuclear research programme. Negotiations to conclude an association agreement with Croatia and Serbia have already started.

Regional competitiveness through increased research at regional level

As the Western Balkan countries emerged from a period of animosity and distrust, collaboration within the region was scant. Research, however, is an area where the benefits of working with neighbours who often share the same challenges and language are evident to all. While initial contacts may have been tentative, researchers from all the Western Balkan countries now work together within research networks, helping to ensure that relations are rebuilt between the people from the Western Balkan region.

The fact that all Western Balkan countries are associated to FP7 and that research entities from Kosovo can participate

9 Council Conclusions 10237/08 of 30 May 2008.

10 Council Conclusions 16767/08 of 2 December 2008.

as a third partner, increases research opportunities at regional level and thus the possibility of finding common solutions to common problems. And the region has many common problems, not least of which is the challenge to meet the requirements for EU membership.

Regional cooperation is also the precursor to regional competitiveness. In today's globalised world, working together locally makes a region more visible on the global research stage and creates a strong competitor. Ultimately, increased competitiveness brings more prosperity to the region. The need for regional cooperation has not gone unnoticed in the Western Balkans: in April 2009, science and research ministers from the Western Balkan countries met in Sarajevo under the auspices of the RCC and adopted a Joint Statement highlighting the need to work together ([11]). Given the size of the region and the cost of the infrastructure, cooperation is extremely important.

Preparing for EU accession negotiations – science and research chapter

In preparation for EU membership, both candidate and potential candidate countries must prepare for compliance with the *acquis communautaire*. Once the country has requested candidate status, which must be granted by the EU council (on the basis of Opinion from the Commission), agreement is reached to open accession negotiations. Only then can the verification process of compliance start. The *acquis* has been divided in 35 'chapters'; Chapter 25 concerns 'Science and Research'.

So far accession negotiations have only been opened with Croatia – they were opened and provisionally closed in June 2006. From the accession negotiations, it became clear that complying with EU research policy was no easy task, even though in most instances compliance does not require transposition of European legislation into national laws.

Compliance with the EU *acquis* on research policy is proved through demonstration that the country:

- has the capacity to effectively participate in the Union's research framework programmes, and
- is contributing to the objectives and realisation of the ERA.

This is why being associated to FP7 is a valuable pre-accession tool for the Western Balkans – it helps to demonstrate what is called the research absorption capacity. Complying with Chapter 25 also requires demonstration that actions are taken to contribute to the Union's objective of strengthening the scientific knowledge and technological bases by building an ERA: i.e., among others, actions to ensure and stimulate the mobility of researchers, promote free circulation of knowledge and encourage industry's engagement in research. With the concept of the ERA now enshrined in the Lisbon Treaty, compliance with its objectives will play an even stronger role in accession negotiations than it did before or at the time of negotiations with Croatia.

Actions on science in society and efforts to ensure gender parity or respect for ethical rules in the conduct of research are also part of the long list of Chapter 25 requirements for compliance. Having means of producing statistics to monitor the implementation of policy targets must also be included in a national strategy on research, as this is necessary to monitor compliance and progress in relation to ERA guidelines and benchmarks.

Compliance with standards – role of the Joint Research Centre

Before any country can become an EU member, it is also required to comply with a long list of standards and technical requirements set at European level as part of achieving the Union's internal market objectives. Standards are in place in various policy areas such as public health, consumer safety, agriculture products and of course in the environmental field – clean air, water and soil. Meeting the EU targets on CO_2 emissions and thus increasing the use of renewable energy sources also requires additional research efforts.

Adapting to meet these standards requires know-how in terms of measuring technologies, applying analysis techniques, administering tests and collecting samples. This knowledge can be obtained by working with researchers from within the EU.

The EU's Joint Research Centre (JRC) also has an important role to play in this respect. Upon its association to FP7, each Western Balkan country gained access to more of the opportunities offered through the JRC's enlargement programme. The initiative has been hugely successful in training scientists in relevant areas and offering guidance on how to implement or monitor these EU policies.

[11] See http://www.rcc.int/admin/files/docs/JS_RRS_conf_240409_en%20.pdf online.

COUNTRY PROFILES

ALBANIA

Remains of the Baptistery at Butrint (UNESCO site), Albania, built in 6th century © Shutterstock, 2009

Albania, a country with over 3.2 million inhabitants, is emerging from a lengthy period of difficulties and hardships. For a long time, Albania was also one of the most isolated countries in the world. But less than 12 years after the start of democratic reforms, Albania – a Mediterranean country situated in the Balkan region – became part of the group of countries whose European perspective was confirmed at the European Council in Thessaloniki in 2003. Negotiations on the SAA with Albania were opened in 2003 and concluded in June 2006 (the agreement entered into force in April 2009).

Albania applied for EU membership in April 2009 and the European Council in November 2009 asked the European Commission to prepare its opinion on the country's capacity to meet the accession criteria.

The Albanian economy recorded a strong and sustained growth rate of 8% in 2008. However, growth in 2009 slowed down due to the global economic crisis and lower remittances from Albanian workers abroad. The economy is gradually becoming more service oriented; this sector already accounts for about 40% of its gross domestic product (GDP). But despite its economic and productivity growth over a 20-year period, Albania's competitiveness remains low. Having recognised this, the Albanian government recently adopted a National Strategy on Science, Technology and Innovation (STI) for the period from 2009 to 2015 which sets out the reforms needed to create a knowledge-based economy.

Based on the renewed European Partnership which the EU Council adopted in February 2008, Albania is also supposed, as a medium-term priority (by 2010-2011) to 'start designing and applying an integrated research policy and further develop measures to boost innovation and competitiveness in small companies' ([1]).

[1] Council Decision 2008/210/EC of 18 February 2008, OJ L 080, 19/03/2008, p. 1.

'The internationalisation of Albania's research efforts is an integral part of the vision behind the National Science, Technology and Innovation plan'

Combining both efforts to strengthen its economy and its ambition to become a member of the EU, Albania started in 2006 to reform its scientific research system with the reorganisation of the Academy of Sciences. This resulted in the integration of the former institutes of the Academy into the major public universities. With this reform, the role of the Academy is now, as is the case in most European countries, one of representation and advice. The research institutes which belonged to the line ministries were also restructured and merged into 12 newly created technology transfer centres and agencies.

According to data from Albania, annual gross expenditure on R&D (GERD) for 2009 is estimated at EUR 15 million, which is below 0.2% of GDP. But as part of the STI plan, the government has set itself the goal of spending 0.6% of GDP on research by 2015.

Data on the number of researchers in the country or the diaspora elsewhere are not available, but as in other countries of the region, scientists are in short supply. To reverse the brain drain phenomenon, the Albanian government, with the support of the United Nations Development Programme (UNDP), set up a 'Brain Gain programme' focusing on the Albanian diaspora by granting incentive packages to returning individuals with foreign degrees to apply for leadership positions in universities and public administration in Albania. The programme also helps in mapping the Albanian student community abroad.

The STI plan also aims at boosting the innovation capacity of the business sector, for example through partnerships with academia and industry and by attracting more business investment from international partners. Albania has also identified the need to concentrate research efforts on thematic areas of strategic interest for modernising the economy, and will finance research as a matter of priority in the agro-food industry and other areas contributing to increased tourism, as well as improving energy supply and water resource management.

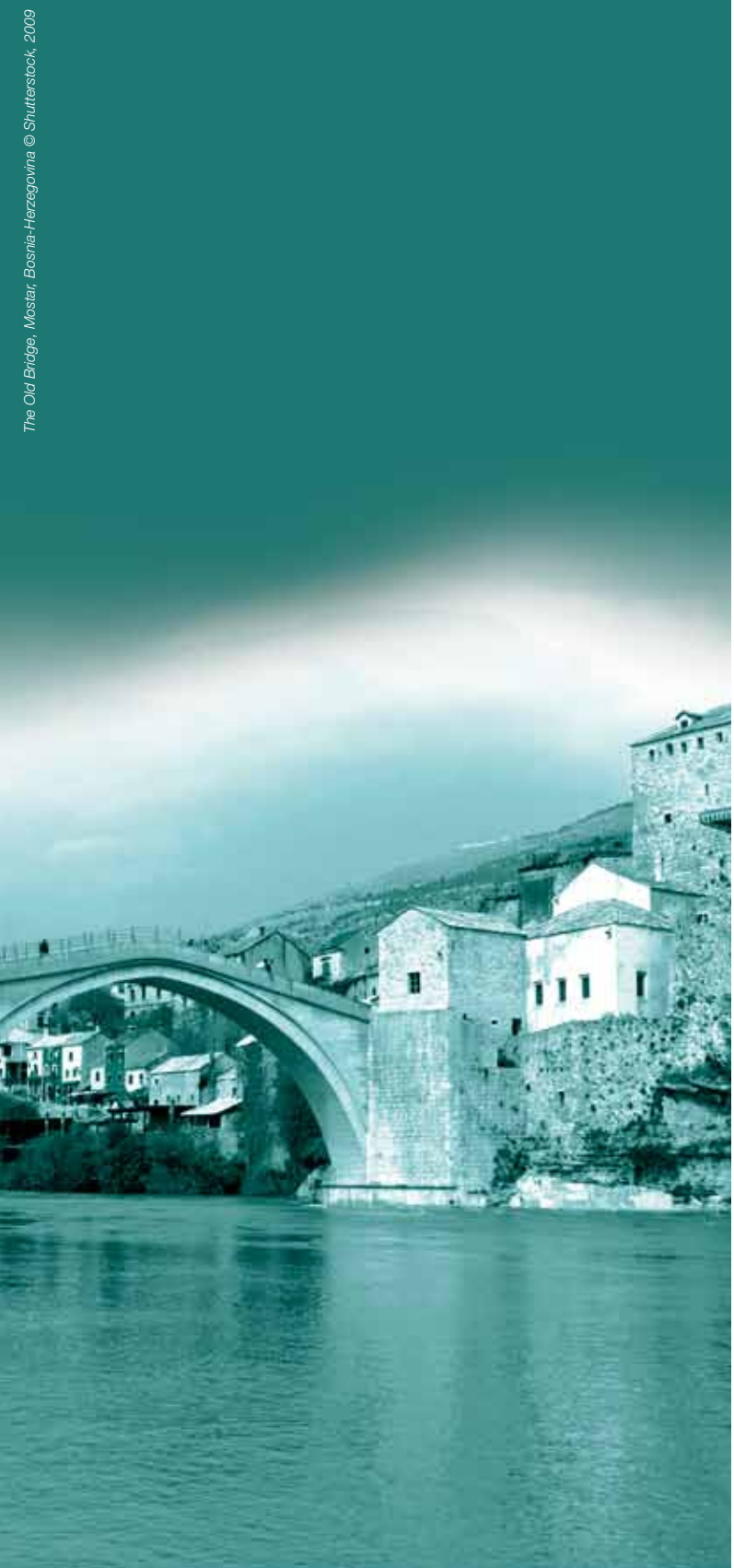
The Albanian scientific infrastructure is limited and largely outdated, making it difficult for the country to generate high-quality research and compete at international level. Efforts are underway to create a better infrastructure starting with support for the development of communication networks and IT systems, and by investing in advanced technologies. Albania is strongly believes in the merits of regional centres of excellence.

The Ministry of Education and Science (MOES) oversees strategic planning and legislative issues of S&T as well as the development of national programmes and international cooperation. The MOES is also responsible for preparing the calls for proposals and assessing the implementation of national funded projects.

The internationalisation of Albania's research efforts is an integral part of the vision behind the STI plan: enhanced cooperation with the EU, notably through association to FP7 and preparing for integration into the ERA, are seen as tools to bring the country closer to the goals set out in its national strategy.

EU research Information Event on 6 May 2008 in Tirana following Albania's association to FP7 jointly organised by DG Research, Joint Research Centre and Albanian MOES.

BOSNIA AND HERZEGOVINA



The Old Bridge, Mostar, Bosnia-Herzegovina © Shutterstock, 2009

Bosnia and Herzegovina (BiH) is situated in the centre of the Balkan Peninsula and is almost entirely landlocked except for a 21-kilometre stretch of coastline along the Adriatic Sea, bordering with Croatia. With its diverse ethnic make-up and its varied landscapes and climate zones, as well as its long history as a place where diverse cultures meet and merge, BiH has for centuries been a melting pot for the exchange of goods and ideas, as seen, for example, in its hosting the Winter Olympic Games just outside Sarajevo in 1984. It is also home to Nobel Prize for literature laureate Ivo Andric, whose book The Bridge on the Drina offers possibly the best introduction to the Balkan region. Today the country has just over 3.8 million inhabitants (compared to 4.4 million before the war), while Sarajevo's population is said to have shrunk to about 400 000, although there has been no official census since the war.

BiH is a potential EU candidate country; the SAA was signed in June 2008. That same year the EU Council also adopted the revised European Partnership which, among other objectives, expects BiH to 'design an integrated research policy' as a short-term priority action (by 2009-2010) ([1]).

Data on investments in research illustrate just how tight the squeeze on BiH's economy is: before the war, research and development (R&D) investments stood at approximately 1.5% of GDP; current spending is estimated to be between 0.07% and 0.1% of GDP. This data is, however, incomplete due to the lack of reliable statistics and of data on private investments in research. Also missing from the data is information on research funding from the other national and regional ministries, estimated to allocate twice as much to research as the responsible ministries of science.

The state is administratively divided into two entities: the Serbian Republic (RS – Republika Srpska) and the Federation of Bosnia and Herzegovina (FBiH – Federacija Bosne i Hercegovine). The FBiH further consists of 10 cantons. As of 2000, the District of Brčko is a separate administrative unit.

[1] Council Decision 2008/211/EC of 18 February 2008, OJ L 080, 19/03/2008, p. 18.

'The Science Development Strategy adopted end of 2009 underlines the need to significantly strengthen and improve the current S&T system'

Authority over the higher education and science sectors is divided between the different BiH entities. The Ministry of Civil Affairs is responsible for science and education at state level. Through its two departments, the Department for Science and Culture and the Department for Education, the ministry coordinates and develops education and science in BiH and, among other things, follows up on the implementation of international agreements and strategic documents within the field of science. In the RS, the higher education and science sectors are regulated at entity level by the Ministry of Education and Culture of RS and the Ministry of Science and Technology of RS. The Ministry of Science and Technology deals with S&T issues within the RS and actively participates in the distribution of information regarding available S&T research funds, in particular those under FP7.

In the FBiH, the cantons are responsible for regulating universities, while the Ministry of Education and Science of BiH performs administrative, professional and other tasks at entity level, including the protection of copyright and intellectual property rights (IPR), as well as the coordination of scientific and research activities. Cantonal ministries regulate educational and science policies in the federation for their respective cantons. In total, 14 ministries have authority over science in BiH, which makes streamlining funding allocations and avoiding the fragmentation of effort – one of the key ERA objectives – very difficult.

The research community in BiH consists mainly of eight public universities in BiH (six in the FBiH and two in RS), nine private universities and about 140 faculties and colleges. The national and university libraries of BiH in Sarajevo and the national and university libraries of the RS in Banja Luka also fund and engage in research, albeit mainly through staffing. In BiH there is an Academy of Sciences and Arts of Bosnia and Herzegovina in Sarajevo, and an Academy of Sciences and Arts for the RS in Banja Luka.

BiH declared that its strategic priority is to 'step forward towards European integration' and this has been reflected in a number of initial but important research policy initiatives. In May 2009 the Framework Law on activities in the field of science and research, and the coordination of internal and international scientific and research cooperation of Bosnia and Herzegovina was adopted.

EU research Information Event in Sarajevo on 23 April 2009, following BiH's association to FP7 jointly organised by DG Research, Joint Research Centre and BiH Civil Affairs Ministry.

A Science Development Strategy for the period between 2010 and 2015 was adopted on 22 December 2009 and is based on the following principals:

- freedom and autonomy of creativity;
- competitiveness of the scientific programmes and projects;
- application of international standards and international quality norms/benchmarks in the field of science;
- decentralised and polycentric organisation within the science field;
- transparency of the work and results that are subject to scientific and expert criticism;
- the ethics of scientists and researchers;
- cooperation with local and international institutions in the field of science and research;
- links to the higher education system;
- the protection of intellectual property;
- human rights and personal and general safety;
- care for sustainable development and the protection of the environment;
- economic and social development needs;
- encouragement and recognition of Bosnia's strengths and needs.

An Action Plan (79 actions) is under preparation, specifying how to implement the actions, involve the stakeholders and what the expected results are. This document is of key importance for the monitoring of the national research strategy and requires that BiH collects data and statistics according to international standards.

Today, most equipment is outdated and BiH suffers from a serious brain drain effect with no real prospect of brain gain to date. The total R&D workforce of professors and assistant professors at the 8 public universities stood at only 3 000 in 2006.

As a first step in becoming more familiar with EU research policy, BiH requested association to FP7. As outlined in the section on research cooperation, association to FP7, which became effective on 1 January 2009, has stimulated the scientific community to become more self-assured and more active in seeking research opportunities with EU Member States and within the Balkan region.

CROATIA

Town Dubrovnik and island in Croatia © Shutterstock, 2009

The Republic of Croatia declared independence and became a sovereign state in June 1991. Shortly thereafter negotiations on the SAA started and were concluded in October 2001 (the agreement entered into force in February 2005). Croatia has a population of about 4.4 million.

The European Council granted the status of candidate country to Croatia in June 2004 and accession negotiations began in October 2005. Chapter 25, on science and research, was the first to be opened and provisionally closed in June 2006. However, as was made clear in the new Accession Partnership adopted by the EU Council in February 2008, Croatia is expected to continue efforts 'to ensure adequate capacity to take up EU-funded research projects and continue to take and implement actions to facilitate integration into the European Research Area' ([1]).

Since 2000, the science system has been restructured with the objective of strengthening the country's research capacity as a lever for national development.

Science and research fall under the auspices of the Ministry of Science, Education and Sport (MSES). The National Council for Science (NCS) provides expert advice on the functioning of R&D programming and monitors the quality of research activities. Evaluation of national research projects is carried out by the Agency for Science and Higher Education. In 2001 a National Foundation for Science was created to promote science and strengthen links between science, education and industry. Croatia is also very conscious of the need to stimulate and foster innovation capacity; in this sense the country has been proactive in launching initiatives such as the Business and Innovation Centre of Croatia (founded in 1998) and the Croatian Institute of Technology (founded in 2006). The Croatian Academy of Sciences and Arts, established in 1866, plays a leading role in promoting and engaging in research.

[1] Council Decision 2008/119/EC of 12 February 2008, OJ L 042, 16/02/2008, p.51.

'Accession negotiations with Croatia on Science and research chapter 25 have provisionally been closed in June 2006 and since then Croatia further strengthen its research and innovation capacity'

Croatia's investment in R&D reached 0.81% of GDP in 2007, compared to an EU average of 1.85%. In 2007, there were 3.4 Croatian researchers (full-time equivalent) per thousand labour force compared to an EU average of 5.7.

Driven by determination to join the EU, Croatia has been active in efforts to strengthen its national research capacity. In April 2008 an Action Plan was adopted to encourage investment in science and research. The plan does not quantify a goal for increasing investment in research, but rather concentrates on actions to stimulate human and material capacity, and to create the conditions necessary to make research investment by industry attractive. Five structural issues have been identified as priorities for attracting investment:

- enlarging the pool of researchers by increasing researcher mobility between countries and between industry and the public sector;
- changing the national financing structure so that it has a focus on encouraging investment by industry;
- improving the quality and quantity of national research;
- ensuring the research community is familiar with the needs of the knowledge economy (entrepreneurship, IPR);
- pushing for public financing to focus on excellence and encouraging researchers in 'ownership' of research.

In a bid to become more familiar with the EU decision-making process and at the same time increase its opportunities for research with the EU, Croatia requested association to the Sixth Research Framework Programme (FP6) and became associated for its last year. Croatia has been associated to FP7 since its start, from 1 January 2007. Croatia has also adopted an Action Plan to stimulate its participation in FP7 in which, as illustrated in the section on research cooperation, it has been very successful.

▲
Mediterranean Institute for Life Sciences (MedILS) located along Adriatic Sea in Split

FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Church of St John at Kaneo (Sveti Jovan Bogoslov), Ohrid © Shutterstock, 2009

The former Yugoslav Republic of Macedonia declared its independence from the former Yugoslavia in 1991. This landlocked country is home to one of Europe's oldest lakes, Lake Ohrid; it was here that the peace Framework Agreement, which provides constitutional guarantees to the ethnic Albanian community, was finalised on 13 August 2001. The country has just over 2 million inhabitants, 560 000 of whom live in Skopje, the capital.

The EU and the former Yugoslav Republic of Macedonia started and concluded negotiations on the SAA in 2001, which entered into force in 2005. The European Council granted the country EU candidate status in December 2005, but accession negotiations have not yet commenced. In the meantime, the country is implementing the SAA obligations and actions to bring its policies and legislation in line with EU standards.

The research community in the former Yugoslav Republic of Macedonia comprises 5 state and 18 private universities (with a total of 44 faculties). As a result of recent reforms, seven public scientific institutes have been integrated into the state universities. Research efforts are concentrated on energy, ICT, materials, genetic engineering, biotechnology and cultural heritage. These research areas reflect both the scientific strengths and needs of the country. The Academy of Sciences and Arts also plays an important role in facilitating S&T research cooperation between academia and industry, developing national S&T policy and evaluating and monitoring the research funded at national level. The Academy is divided into five departments: mathematical sciences, biological and medical sciences, social sciences, linguistics and literature sciences, and arts. The Academy also aims for stronger international cooperation in science.

The country has stepped up its efforts to comply with EU research policy measures and objectives. The country has started to establish a national strategy (2006-2010), so far mainly concentrating on strengthening its research and technological development capacity in order to ensure successful participation in the Union's research framework

'In preparation of accession to the EU, the country is committed to step up its efforts on research and in that spirit a new research strategy is being prepared'

programmes. In 2009, the Council for Research and Development was established as an advisory body to the Minister of Science. It is composed of representatives from the public sector and universities.

As expected by the Accession Partnership adopted by the EU Council in February 2008 ([1]), the Research Council is drafting a new strategy for the period from 2011 to 2015 which will establish research priorities in line with those of the EU, ensures an integrated approach in S&T activities, redefines criteria for support for R&D activities, intensifies regional and bilateral cooperation, and aims to increase R&D investments to 1% of GDP by 2015.

Given the lack of reliable statistics, it is very difficult to value the amount of investment in research today, but it was estimated at 0.18% of GDP in 2007. This includes the very minimal spending of the business sector on research but not the research funding by other ministries.

The number of researchers in the overall workforce is also very limited (about 3 600 in 2008) and it continues to decline. In common with other countries in the region, the former Yugoslav Republic of Macedonia suffers from a brain drain due to both the post-war situation and its lack of sufficient, attractive research capacity. But it is one of the five countries in Europe that has achieved gender parity, with 44% of the scientists being women.

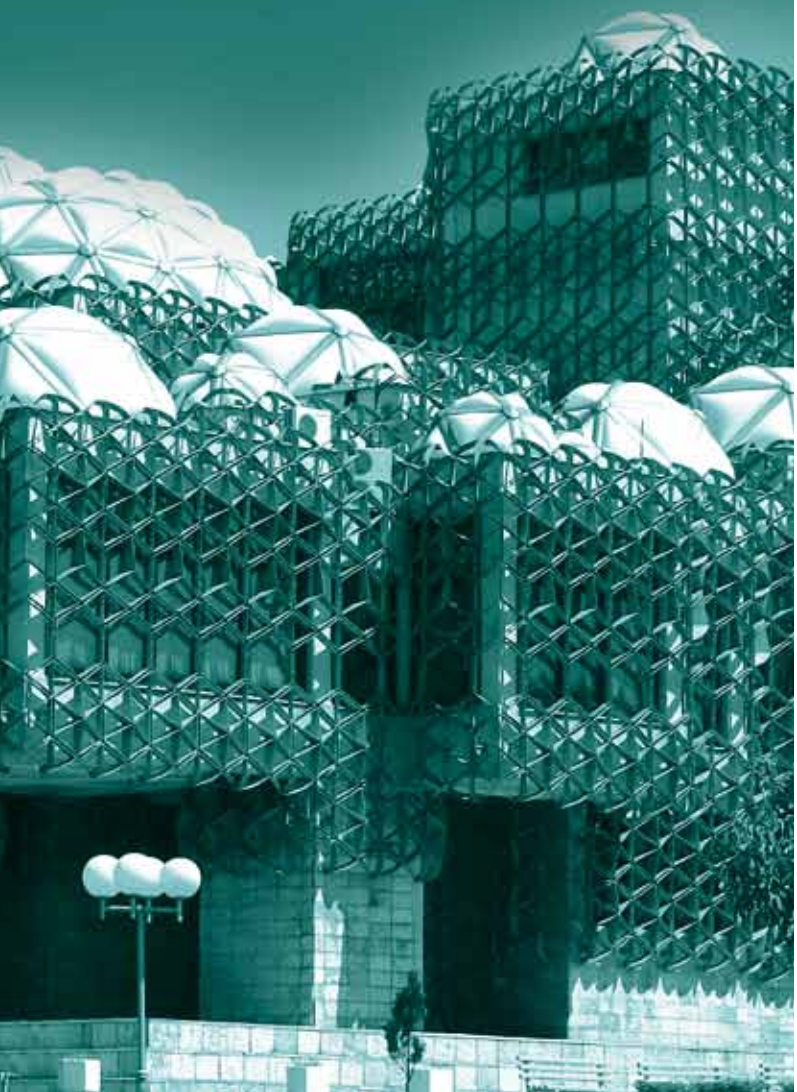
As illustrated in the section on research cooperation, since the former Yugoslav Republic of Macedonia gained association to FP7 on 1 January 2007, it has been successful in increasing its participation.

▲

Shaking table test at the Institute for Earthquake Engineering and Engineering Seismology, Skopje, (picture provided by: Assoc. prof. dr. Lidija Krstevska)

[1] Council Decision 2008/212/EC of 18 February 2008, OJ L 080, 19/03/2008, p. 32.

KOSOVO [1]



National and University Library of Kosovo in Pristina

Kosovo ([1]) currently counts about 2 million inhabitants; about 200 000 are still resident outside Kosovo with the status of internally displaced persons or refugees.

The absence of an EU position on Kosovo's status (Kosovo unilaterally declared its independence on 17 February 2008) does not prevent the EU from engaging with Kosovo. At the Thessaloniki Council in 2003, the EU offered Kosovo the chance to share the European perspective of the Western Balkans. According to the European Partnership adopted by the EU Council in February 2008, Kosovo is expected to adopt 'an integrated research policy' in the medium term (by the period between 2011 and 2012) ([1]). As part of the SAP Tracking Mechanism (STM), exchanges of view took place on how to engage in research under FP7 and contribute to the ERA objectives. In line with the overall EU objective of having an ERA open to the world, with neither political nor historical borders, research entities from Kosovo are eligible to participate and obtain FP7 funding as an International Cooperation Partner ([2]).

The Communication adopted by the European Commission in November 2009 entitled 'Kosovo – Fulfilling its European Perspective', in which it is proposed to strengthen the SAP with Kosovo, has been welcomed by the EU Council in December 2009. The Council invited the Commission to take the necessary measures to support Kosovo's progress towards the EU in line with the European perspective of the region.

In the Communication, the European Commission identifies the actions needed to further the European perspective of Kosovo in the coming years: Kosovo's full participation in Community programmes, including FP7, is one such action. Research cooperation thus becomes central to fostering solid ties between the EU and Kosovo. This is fully

2 Council Decision 2008/213/EC of 18 February 2008, OJ L 080, 19/03/2008, p. 46.

3 See the ICPC list (ftp://ftp.cordis.europa.eu/pub/fp7/docs/icpc-list.pdf).

'Kosovo has recently announced that research is a political priority and as a first step established the National Research Council'

in line with the EU's Lisbon Agenda objective to achieve sustainable economic growth and bolster prosperity and stability by increasing research capacity.

In the absence of data it is not possible to quantify the investment in research or the number of scientists as a percentage of the population or workforce, but the research capacity is very weak. Kosovo has, however, recently announced that research is a political priority and the National Research Council will submit to the Assembly a draft proposal for a National Strategy for Science. The draft will recommend a national budget for research that will gradually increase and that stimulates cooperation with industry and international partners.

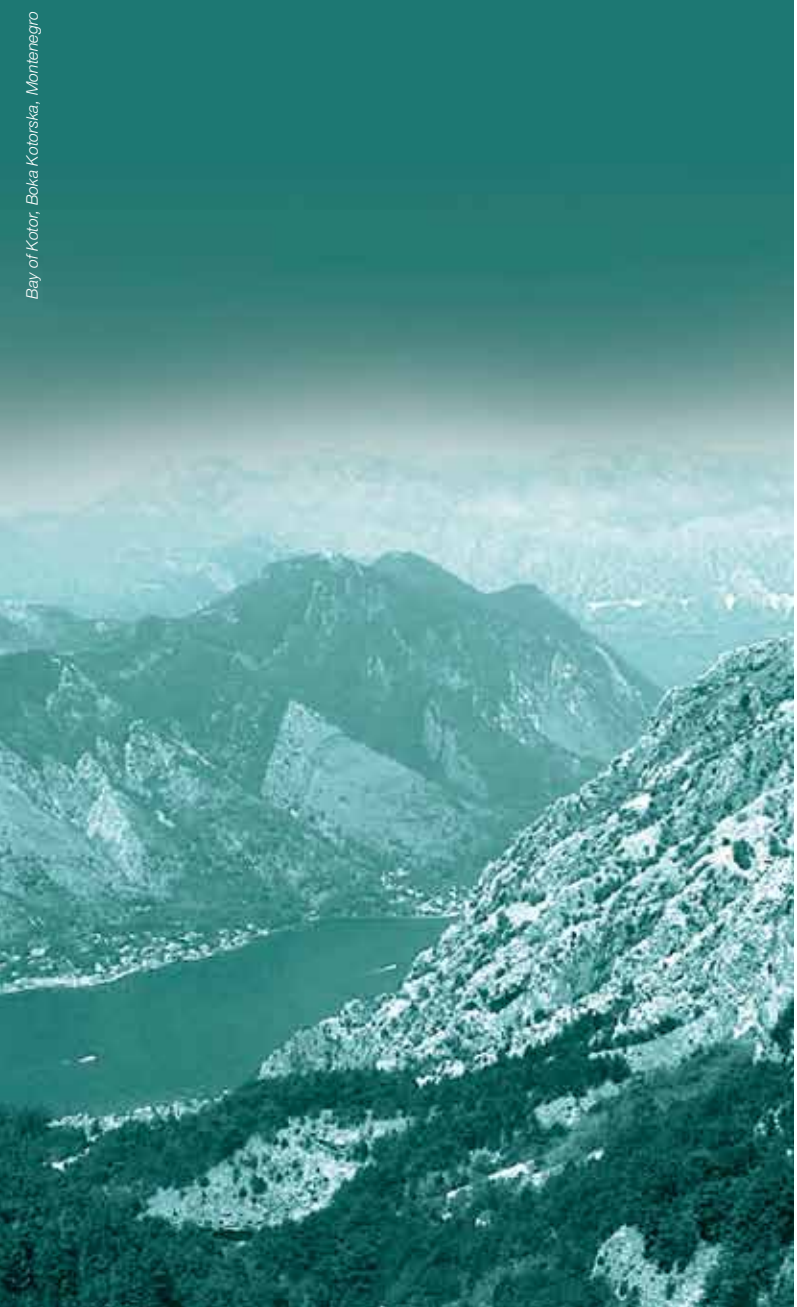
In addition, the Ministry of Education, Science and Technology has proposed the creation of a Fund for Scientific Research. Kosovo recognises that it urgently needs to develop its research activities in the areas of information and communication technologies (ICT), environment, food safety, health and medical research, as well as in social sciences, because this would best support Kosovo's socio-economic development while at the same time facilitating compliance with EU standards.

Its plans for bolstering research recognise the importance of engaging in research with the EU. Kosovo has taken initial steps in this direction with the nomination of a National Contact Point (NCP), whose role is to inform the public about the Union's research programme and offer support and advice to potential applicants and project participants.

The Rector of the University of Prishtina and the Minister of Energy and Mining at the foundation laying ceremony of the first geological laboratory in Kosovo

Searching for EU research projects at University of Prishtina

MONTENEGRO



Bay of Kotor, Boka Kotorska, Montenegro

The smallest of the Balkan states with around 628 000 inhabitants, Montenegro is also one of Europe's newest countries. Montenegro gained independence in 2006 following a split with Serbia. But the young state did not take long to establish itself domestically or on the world stage – a constitution was adopted the following year and it was immediately recognised by the EU as a potential candidate country. The SAA was signed in October 2007 and in December 2008 Montenegro applied for EU membership. In 2009, the Council of Ministers invited the European Commission to submit an opinion on the application. As part of this process, questions and answers on the EU *acquis*, including on Chapter 25 (on science and research) are being examined to assess Montenegro's ability to comply with EU research policy requirements and objectives.

Politically speaking, European integration is one of Montenegro's strategic priorities and this is well reflected in the way it intends to pursue research cooperation. Moreover, as required by the European Partnership with Montenegro adopted in January 2007, Montenegro is expected, as a medium-term priority (by 2010-2011), to 'design and start applying an integrated research policy to support research and development activities' ([1]).

In July 2008, the government adopted a 'Strategy for scientific-research activity 2008-2016', largely based on the Lisbon strategy and aiming to create a knowledge-based society and bring the country in line with the ERA objectives. In this context, the strategy established a roadmap for increasing spending on R&D to 1% of GDP by 2011 and 1.4% by 2013. Taking into account that the level of investment in R&D in 2007 was about 0.13% of GDP, which due to lack of data does not include investments by the private sector, this means that serious efforts will be required if the 1% target is to be achieved by 2011. No concrete measures to encourage investment in research have yet been taken.

[1] Council Decision 2007/49/EC of 22 January 2007, OJ L 020, 27/01/2007, p. 16.

'For a small country international research cooperation is important and Montenegro declared Research cooperation with the EU its priority'

Students from University of Montenegro, Faculty of Biology, engaged in research on organic food.

In terms of research priorities, Montenegro will support research cooperation through co-financing in the areas of science and education; natural and cultural heritage, demographic structure, national identity and language; ecology; tourism; agriculture; healthcare, and energy. As part of its national strategy, Montenegro intends to bring the research areas more in line with its natural, technological and scientific assets.

As one would expect of a small country, human research capacity is limited. In 2008, Montenegro had 766 full-time researchers, who together with part-time colleagues and external research associates work in the 2 public universities, 9 private higher education institutions, and government and private sector. Researchers currently account for 0.48% of the employed population. In addition, in common with other countries of the region, Montenegro suffers from brain drain following the war. To address the issue, several support measures have been taken, such as actions and programmes, together with non-governmental organisations (NGOs), to attract young people to science studies; support for researcher career development by paying part of the fees for postgraduate studies and facilitating training abroad by allowing for unpaid leave or through making housing attractive for scientists. The University of Montenegro is now in a position to offer housing to all its PhD holders employed by the University. An Action Plan to ensure mobility of researchers is part of the National Strategy, including setting up the national EURAXESS portal. No special actions on gender are necessary as female scientists are well represented in Montenegro.

The country also lacks modern research infrastructure: according to a recent survey conducted by the WBC-INCO.NET project, Montenegro has very few research institutes and faculties that could qualify as modern research infrastructures. This, combined with the economic recession, continues to hamper the development of sufficient capital necessary to attract Montenegrin scientists back to their homeland.

The MoES was reorganised in 2009, and was split into a department for science, research and technological development, and a department for higher education. The MoES defines and implements scientific policy; as the main funding body in the country, it organises calls and monitors the implementation of the funded research projects. A Council for Scientific Research Activities was established in 2006 that acts as an independent body under the administrative management of MoES. The Council analyses specific research areas and advises the government. It consists of nine members, one-third from the government and two-thirds from the research community. Its main task so far has been to propose the national strategy to the government. The Bureau for International Scientific, Educational, Culture and Technological Cooperation (ZAMTES), founded in the 1970s, carries out the tasks with third countries.

Another important stakeholder is the University of Montenegro, founded in 1974, which comprises 19 faculties and 3 research institutes spread over several towns throughout the country. The Montenegrin Academy of Sciences and Arts is the most significant scientific institution in the country. Founded in 1973 as the Montenegrin Society for Science and Arts and renamed in 1973, the Academy has a total of 25 committees engaged in natural sciences, social sciences and arts. The privately owned University Mediterranean also engages in research through its independent faculties for scientific research.

As the research community in Montenegro is small, it is of vital importance that it engages in research cooperation with third countries. The EU has been identified as a priority, and to demonstrate this, Montenegro requested association to FP7 as soon as it gained independence. Its association to FP7 became effective on 1 January 2008. As the section on research cooperation shows, Montenegro has been successful in a number of important research projects with partners from the EU and the Balkan region.

SERBIA

Kalemegdan fortress in Belgrad © Shutterstock, 2009

On 6 June 2006, the Republic of Serbia became the legal successor to the State Union of Serbia and Montenegro, following a referendum in Montenegro to opt for independence. Just six days later, the EU Council also recognised the Republic of Serbia as the legal successor to the State Union. Serbia ratified its new constitution in October 2006 and parliamentary elections were held for the first time in 2007. Serbia counts 7.4 million inhabitants.

Serbia is a potential candidate country for accession to the EU that submitted its request to become Member State in December 2009. The SAA and an Interim Agreement on Trade and Trade-related issues between the EU and Serbia were signed in April 2008.

Notwithstanding the economy's rapid expansion with an average growth rate of 6.5% between 2004 and 2008, Serbia is still feeling the effects of the war: in the 1990s, more than 500 000 people left the country, with most émigrés being young university graduates. Serbia is also strongly affected by the global economic crisis, resulting in a serious decline in the economic growth rate (less than 4% in 2009). Against this background, the economic situation is imposing new constraints on Serbia, which is at the same time aware of the need to strengthen its national research capacity which requires substantial financial efforts. Moreover, young people are continuing to leave the country in search of opportunities elsewhere, while those already abroad are postponing their decision to return to their native land.

The budget allocation for research has stagnated at about 0.3% of GDP for years, and investments in technology by industry remain insignificant. Serbia should therefore prioritise the creation of an 'integrated research policy', as expected by the EU Council in the new European Partnership Agreement adopted on 18 February 2008 ([1]).

[1] Council Decision 2008/213/EC of 18 February 2008, OJ L 080, 19/03/2008, p. 46.

'Science is a high-status field in Serbia with a tradition of producing top-quality scientists'

Visit of Commissioner for Research J. Potočnik at the Institute of Molecular Genetics and Genetic Engineering (IMGGE) in Belgrade on 28 June 2009 (http://www.imgge.bg.ac.rs)

In 2008, the new Serbian government declared that bringing the country closer to the EU was a key priority. The new government also adopted a law establishing new ministries, including a separate Ministry for Science and Technological Development (MSTD). The MSTD is made up of five sections, including one responsible for international cooperation and European integration. In June 2009, the MSTD launched a public debate on a strategy for research, declaring that investing in research and technology is the only way to create a sustainable economy and society. The goal is to reach R&D expenditure levels of 1% of GDP by 2014, to focus on key scientific areas, and to forge research partnerships – both between the public and private sectors, and with international partners and stakeholders.

In terms of human resources, in 2007 Serbia counted about 10 580 researchers, or 0.36% of the total workforce (i.e. 2.9 million). But Serbia realises that there are too few young researchers, and many scientists will soon retire. In addition, the number of students opting for natural sciences and mathematics at universities keeps decreasing. However, Serbia is one of the 5 countries in Europe with researcher gender parity: about 43% of its scientists are women.

The MSTD is responsible for both policymaking and funding. In 2009 it financed about 501 projects using 50.2% of its budget in the area of basic research, and 471 projects or 39.2% of its budget in the area of technological development. The remaining funding was allocated to developing human resources, nuclear and radiation safety and international cooperation. But about 80% of the funding represents researcher salaries, leaving only 20% for scientific experiments.

The University of Belgrade is the biggest and most important university in Serbia. It consists of 31 faculties and 11 institutes covering different fields of science and boasting leading faculties in mathematics and physics. In addition, there are several private universities in Serbia which are also active in research. The Serbian Academy of Sciences and Arts also engages actively in scientific research projects in cooperation with local and international research teams.

Serbia is also very much aware of the need to link research to innovation. In this respect, the leading Serbian R&D Institute Mihajlo Pupin (also known simply as the Pupin Institute), which is also the largest and oldest in the whole of south-eastern Europe, plays an important role.

As shown in the report on infrastructure by the WBC-INCO.NET project, Serbia has a number of research institutes and laboratories which have the potential to become larger-scale facilities. However, the main obstacle to upgrading and developing research capacity is the lack of funding. In 2009 the MSTD was proactive in seeking partners to support the development of its infrastructure: a recent result was the approval of a loan by the EIB to upgrade strategic projects in the field of science and science education.

Science is a high-status field in Serbia and the country has a tradition of producing top-quality scientists. Therefore, it comes as no surprise that Serbia was among the first Balkan countries to request association to FP7. Its association became effective on 1 January 2007. Since then it has substantially increased its research cooperation activities with EU Member States and with research entities in the Balkan region. In March 2008 Serbia established a Consultative Bureau for International Projects, whose main purpose is to provide support and guidance to Serbian scientists seeking to engage in research cooperation under FP7 and with other international partners. As outlined in the section on research cooperation, Serbia is well embedded in the European scientific community.

OVERVIEW

of main economic factors and indicators*

	Capital	Population	GDP (billion EUR)	GDP per capita
Albania	Tirana	3 170 050	7.9 (2007)	2 491
Bosnia and Herzegovina	Sarajevo	3 843 440	12.6 (2008)	3 290
Croatia	Zagreb	4 436 400	47.4 (2008)	10 678
former Yugoslav Republic of Macedonia	Skopje	2 045 180	5.8 (2007)	2 834
Montenegro	Podgorica	627 480	2.8 (2007)	4 484
Serbia	Belgrade	7 365 510	29.5 (2007)	4 002
Kosovo (UN SCR 1244)	Pristina	2 153 140	3.4 (2007)	1 612

*Based on Eurostat or statistics from national offices or UNESCO statistics

Purchasing Power Standards (PPS) in % of EU-27 average	R&D intensity in % GDP	Number of scientists (of workforce)	Status
25	below 0.2% (2009)	NA	potential candidate country/ requested membership 28.04.2009
30	0.07 - 0.1% (2008)	3 000 (2006)	potential candidate country
63	0.81% (2007)	3.4 per 1 000 labour force	candidate country/ negotiations opened
32,5	0.18% (2007)	3 600 (2008)	candidate country
46	0.13% (2008)	766 (2008)	potential candidate country/ requested membership 15.12.2008
37	0.30% (2008)	10 580 (2007)	potential candidate country/ requested membership 22.12.2009
6.9	NA	NA	European partnership

RESEARCH COOPERATION:

from participation on a project basis as third country to association to the Seventh EU Research Framework Programme (FP7)

The 1980s: research with the former Republic of Yugoslavia

In the 1980s, the International Scientific Cooperation programme for research and technological development implemented by the Directorate-General for Research had access to an annual budget of EUR 3 million to promote S&T cooperation with the then Republic of Yugoslavia. Joint research was promoted mainly in physics, fine chemistry, environment and biotechnology. Over this period, experienced postdoctoral Yugoslav scientists also benefited from short-term funded fellowships.

During the war period, research cooperation with the Western Balkan region ended. When it gradually resumed, it did so in line with political commitments made at EU level.

Research under FP5: a first dedicated call

Under the Fifth Framework Programme for Research (1998-2002), for the first time a special call was organised allowing the funding of several projects mainly focusing on environment and health. A budget of EUR 5 million had been made available that allowed, among others, to address the problems relating to coal ash disposal in the Tuzla region (BiH) or provide for an assessment of the waste water treatment in the region (BiH, Croatia and the former Yugoslav Republic of Macedonia) in order to verify if the market for ceramic products could be developed.

Research under FP6: thematic research and capacity building

Given the success of the projects funded under FP5 and the growing political importance the Western Balkans took at EU level, it was decided to continue with the organisation of dedicated calls under the Sixth Research Framework Programme (2002-2006). The calls under FP6 focused, in line with the Thessaloniki agenda, on both thematic areas (environment, health and energy) and on capacity building.

On environment, for example, the ECO-PCCM project involved research institutes from Serbia and the former Yugoslav Republic of Macedonia as well as teams from Bulgaria, Spain Italy and Hungary. All worked together to develop new eco-friendly and cost-effective materials for use in the construction sector. The Faculty of Metallurgy in Skopje played a considerable part, taking on responsibility for testing materials in the favourable micro-climate around Lake Ohrid. Following the project, the country's Ministry of Environmental and Physical Planning announced that it would consider tax relief for the production of eco-compatible composite construction materials.

The former Yugoslav Republic of Macedonia is one of the 5 countries in Europe with gender parity: more than 44% of scientists are female. Picture taken at Faculty of Technology and Metallurgy, co-coordinator in FP6 ECO-PCCM project

Several projects focused on the post-conflict and post-trauma health problems resulting from the war. The CONNECT project, for example, examined the components and organisation of healthcare and community-based interventions for people with posttraumatic stress disorders. A survey of more than 800 persons who had experienced traumatic stress allowed the research team to identify mechanisms and major components of the trauma, as well as ways in which to aid recovery. The project was coordinated by the Queen Mary and Westfield College of London, UK and involved research institutes from Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Germany, Italy and Serbia.

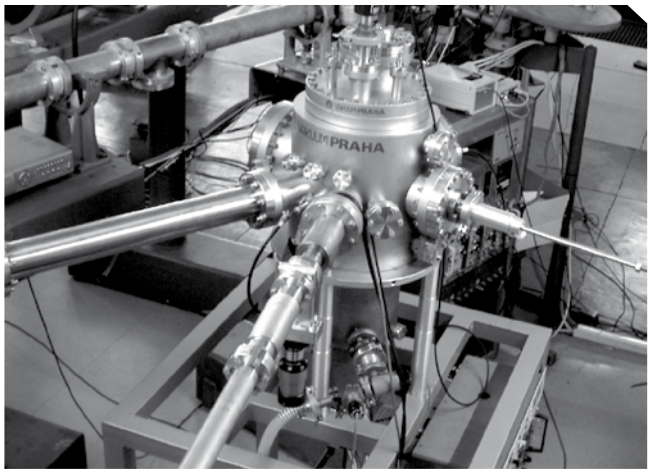
Additional capacity-building projects

In 2004 and 2005, a total of EUR 8.5 million in FP6 funding was allocated to capacity-building actions. This allowed the financing of 30 projects, selected from more than 294 submissions.

As illustrated below, the projects supported networking between scientists; training and/or the replacement or upgrade of S&T equipment or training on how to engage in research cooperation with international partners. They created a real dynamic within the Balkan research community as they allowed scientists from the region to meet and exchange views with counterparts from the EU, putting an end to their isolation.

The RBI-AF project has enabled the upgrading of the electrostatics accelerator facility at the Ruder Boškovic Institute in Zagreb (Croatia). The facility is used by researchers from various sectors and fields, such as nuclear and atomic physics, materials science, environmental science and those dealing with cultural heritage. The facility is now able to carry out far more precise measurements and analyses of materials, thereby increasing not only the attractiveness of the institute for scientists from the entire Balkan region, but also facilitating links with clients and service providers.

Dual beam end-station in place ▼
(provided under Work package 3
of the RBI-AF project)



The Institute of Physics in Belgrade (Serbia) was selected for four support actions: two on nanotechnology, one on optics and one on computing. Through the CX-CMCS project, the Scientific Computing Laboratory (SCL), which works with grid computing and simulations of complex systems, received funding which enabled the institute to hire young researchers, provide training and mobility opportunities for research staff, and upgrade the computing infrastructure.

▲ Institute of Physics in Belgrade.
Photo and design by Igor Smolic (Serbia)

This reinforced capacity meant that the SCL was able to become a partner in Europe's flagship GRID project and obtain funding from other stakeholders (a NATO grant and bilateral projects with France, Germany, Slovenia and Switzerland). It also convinced the government to launch an ambitious seven-year initiative that will lead to the creation of the new Blue Danube supercomputing facility at the Belgrade Institute for Physics, located on the beautiful flanks of the Danube. The SCL's quest for sustainability has also led to it forging an academic partnership with IBM.

The RETEXRESALB project led to the reinforcement of human and material capacities at the Textile Technology Research Centre in Tirana (Albania). Lecturers from the textile departments of Ghent University in Belgium and TEI Piraeus in Greece led courses for Albanian teaching staff and researchers, while students and staff from Albania also spent three months in either Belgium or Greece, taking part in research activities and receiving specialised training.

From the very beginning, industry was involved in this project, and through seminars and workshops knowledge was transferred on new production technologies and the opportunities for eventually making the move from more traditional to technical textiles. Funding also covered the purchase of equipment for the quality control of textiles. The project has triggered other funding possibilities: two Albanians were successful in obtaining an Erasmus Mundus Basileus grant, allowing them to continue three-year postdoctoral studies at the department of textiles at Ghent University in Belgium.

Support project for all Western Balkans

Notwithstanding these successes, the Western Balkan countries' participation under FP6 remained very low. A support action was granted to enhance the quality and quantity of the research entities from the Balkan countries in the EU framework programmes. The ERA WESTBALKAN and later ERA WESTBALKAN PLUS projects organised training on how to set up a network of NCPs in a country, how to find research partners and use CORDIS (the Community Research & Development Information Service), and to understand better the contractual and financial aspects of framework programme collaboration.

Projects aiming at structuring research efforts

SEE-ERA.NET and SEE-ERA.NET PLUS

At the core of the ERA is the need to overcome the fragmentation of research efforts through better coordination and cooperation. A specific instrument – the ERA.NET scheme – was designed under FP6 to bring together national and regional programme makers and managers of a given research topic or region, with the aim of better coordinating research efforts and organising joint calls. All of an ERA.NET's additional coordination costs are met by the European Commission.

For the Western Balkan region, an ERA.NET covering all south-east European countries – SEE-ERA.NET – was established. It brought together the ministries of science and research funding agencies from each of the six Western Balkan countries as well as Bulgaria, Romania and Turkey (all EU candidate countries at the time) and Austria, France, Germany, Greece, Hungary and Slovenia, comprising a consortium of 17 institutions from 14 countries. The five-year project (2004-2009) was coordinated by the Austrian Centre for Social Innovation in Vienna. This project led to converging actions in and for the Balkan region but above all it gave significant visibility to the Western Balkan region in the EU research community. It also elaborated a White Paper for future actions ([1]) that gives a good insight into the state of the art in the region.

Through the exchange of information and best practices, the Western Balkan ministries acquired knowledge on how to design a national S&T strategy. Non-Balkan participants gained information on how their international and bilateral S&T programmes could best meet the needs of the Western Balkan countries. SEE-ERA.NET was a real success – it went as far as organising a Pilot Joint Call that attracted the submission of 200 research proposals, of which 32, involving 160 research teams from 14 countries, were selected. Although the budget of EUR 800 000 was modest, the consortium managed to achieve exactly what the European Commission expected: convergence among national programmes and vis-à-vis third countries so as to create critical mass and avoid fragmentation. The significant oversubscription shows a real demand and potential for joint research.

This potential is now the subject of ERA.NET PLUS, a subsequent European Commission scheme launched under FP7 to encourage national ministries to organise joint calls. SEE-ERA.NET PLUS launched a single call for Joint European Research Projects (JERPs) in 2009 and is expected to fund around 23 transnational research projects in Southeast Europe in the areas of agro-food and ICT. The planned call budget is around EUR 3.5 million (EUR 2 675 million from national funding, with the balance being covered by FP7 funds).

WBC-INCO.NET

A new approach to international S&T cooperation under FP7 aimed at integrating international research collaboration across all FP7 programmes and themes. This objective is being supported through new instruments.

[1] SEE-ERA.NET White Paper – Transition Studies Review, vol. 14, No. 2, 2007, Springer Wien, New York.

Under the International Cooperation programme within the FP7 Capacities Specific Programme, instruments are designed to encourage a policy dialogue with international research partners, either at bilateral or regional level or on specific issues. INCO-NETs, for example, are designed to strengthen the regional coordination of S&T cooperation, including research priority-setting and dialogue with partners.

The first FP7 call for proposals in 2006 included a call for an INCO.NET addressing the Balkan countries specifically. In doing so, it allowed for the continuation of the activities started by the FP6 capacity-building project SEE-SCIENCE.EU, which was already successfully bringing research ministries from the Balkan region together.

The INCO.NETs establish a coordination platform through:

- bringing together different stakeholders (policymakers, researchers and the private sector);
- representatives from the target region with other EU and third country stakeholders to identify research priorities;
- raising awareness and organising dissemination activities;
- carrying out strategic analysis of S&T trends and mapping research capacities in the targeted region;
- monitoring and reviewing cooperation.

The WBC-INCO.NET ([2]) was launched on 1 February 2008 in Ljubljana and involves 26 partners from 15 countries. It is coordinated by the Centre for Social Innovation in Vienna, Austria and provides for both analytical and operational support, with the ultimate goal facilitating the integration of the Balkan region into the ERA. The project website provides regular updates on S&T. In addition, a study on barriers to cooperation has identified the major obstacles to mobility of scientists from the Balkans; a report has identified the accessibility of large-scale infrastructure in the region; other reports have covered cooperation patterns and S&T policies towards global issues. Each study has been presented in ad hoc workshops but also within the Steering Platform on research, where a more policy-oriented debate can take place.

Working groups are also looking at research themes of interest for all the Western Balkan countries with the aim of joining forces at regional level. Furthermore, several training activities have addressed topics including statistical indicators and project financing and targeting researchers, research managers, NCPs and policymakers. At more of an operational level, the WBC-INCO.NET provides technical support to the Steering Platform on Research and disseminates information on research opportunities available for the Western Balkan countries through FP7 and other instruments. A newsletter on the latest events and actions of interest is published regularly on the WBC-INCO.NET website.

wbc-inco.net
Co-ordination of Research Policies with the Western Balkan Countries

Association to FP7

As of 1 January 2009, all Western Balkan countries have been associated to FP7. Research entities from Kosovo can participate as a third country partner.

This means that these countries share the same research opportunities as the EU Member States and other countries associated to FP7 (Iceland, Israel, Lichtenstein, Norway, Switzerland and Turkey).

As under FP7 the bulk of the research cooperation takes place under the Cooperation Specific Programme (EUR 34 billion of the EUR 50 billion FP7 budget), this also means that as associated countries, the Western Balkan countries have to seek more and more for effective research collaboration projects if they are to be selected for funding and increase levels of participation.

Statistics illustrate how association status increased participation for most Western Balkan countries from the outset: (see table on the next page)

These figures are, however, approximate and give only trends of the degree of participation. In addition, irrespective of association status, it is also difficult to compare participation under FP6 and FP7 given that the approach to international cooperation has changed. Also, Croatia was already associated for the last year of FP6, and for Serbia and Montenegro there are no disaggregated statistics under FP6.

[2] See http://www.wbc-inco.net online.

pictures below ▼

Signing ceremony in Brussels on association to FP7 with respectively:
Croatia, Former Yugoslav Republik and Serbia on 13 June 2007
Albania on 17 December 2007
Montenegro on 25 January 2008
Bosnia and Herzegovina on 24 November 2008

	FP6 (2002-2006)	FP7 (2007- 2009)	
	Applicants/contracted	Applicants Contracted & mainlisted	Proposals Contracted & mainlisted
Albania	42	24	20
Bosnia and Herzegovina	44	20	19
Croatia	156	162	122
former Yugoslav Republic of Macedonia	67	51	41
Montenegro (and Serbia)	121	24	21
Serbia (and Montenegro)		123	101

Research under FP7: engaging in effective research collaboration

CEUBIOM: a research consortium on biomass availability for bio-energy

The 16 partners within the 'Classification of European biomass potential for bio-energy using terrestrial and earth observations' (CEUBIOM) project are developing a common methodology for collecting information on the potential of biomass using terrestrial and earth observation. The partners include research entities from Bosnia, Croatia and the former Yugoslav Republic of Macedonia. The end products will be the establishment of a harmonised approach and an e-training tool for sharing information on biomass potential and best practices.

Earth observation (EO) satellites enable scientists to monitor the environment efficiently, reliably and at low cost. Monitoring takes place over time at global, regional and local scales. The combined use of EO-derived data with measurements from agricultural and forestry surveys is a powerful tool for assessing biomass potential ([3]).

SHARE: a research consortium on earthquake hazards assessment

Montenegro's Seizmoloski Zavod Crne Gore is one of 17 partners developing a unified framework and computational infrastructure for seismic hazard assessment within the 'Seismic hazard harmonization in Europe' (SHARE) project. The project aims at developing common methodology and tools to evaluate earthquake hazards in Europe. The work includes a definition of engineering requirements, the collection of data and the formulation of the most effective

[3] See also http://ceubiom.org online.

and efficient procedures for hazard assessment. The three-year project will also carry out an assessment covering the whole of the EU as well as the Maghreb countries and Turkey. The results will be used by critical industries such as the energy infrastructures and the re-insurance sector ([4]).

FOCUS BALKANS: a network for safer food

The FP7 Focus Balkans project funded under the thematic area 'Food, agriculture and fisheries, and biotechnology' aims at improving competencies and understanding in the field of consumer food science in the Western Balkan countries. Under the coordination of the Swiss Institute AGRIDEA, the project is setting up a network of stakeholders including academia, industry and consumer organisations active in the field of food consumer science. The goal is the development of joint research and increased understanding of food consumers in the region, with a focus on products with positive nutritional properties (fruits and health/diet foods) and/or sustainability (organic and traditional food products). The project includes training for the participating Balkan institutes, enabling them to become familiar with state-of-the-art methodologies, practical techniques and theories. This project ultimately contributes to capacity-building in public health and consumer protection ([5]).

BECAN: a public health project

The kick-off meeting of the Balkan Epidemiological study on Child Abuse and Neglect (BECAN) project took place in Athens, Greece on 7 December 2009. The aim is to map the incidence and prevalence of child abuse and neglect among children aged between 11 and 16, both in and out of school, in 5 Balkan countries (Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, and Serbia) as well as in Bulgaria. Reliable and comparable data are essential to raise awareness and understanding of the phenomenon, while bringing it under control and preventing it. However, existing data on child abuse and neglect are incomplete in the region and the BECAN project's first major task will therefore be to collect data through joint research that will enable comparisons and lead to solutions to common problems ([6]).

ICT projects

The WINS-ICT project aims at a creating a sustainable network on S&T cooperation on IT by bringing together innovative ICT researchers from the Western Balkans and their EU counterparts.

The project is also building up the capacities and capabilities (through training and mentoring), as well as the visibility of the region's researchers, with a view to them participating in FP7 on equal terms with Member States. Training workshops and networking events to foster FP7 participation have been organised for each Western Balkan partner.

The WINS-ICT portal ([7]) is becoming a key reference point for information on ICT in the Western Balkan countries as well as offering opportunities for collaboration within FP7.

Research Potential Actions

While it is recognised that association status increases opportunities to strengthen research capacity and participate in research projects with European partners, the Western Balkan countries share the socioeconomic imbalances experienced in the convergence regions of the EU Member States. Entities established in the Western Balkan countries are therefore able to participate in the calls organised under the Research Potential programme of the FP7 Specific Programme Capacities.

4 See also http://www.share-eu.org online.

5 See also http://www.focus-balkans.org online.

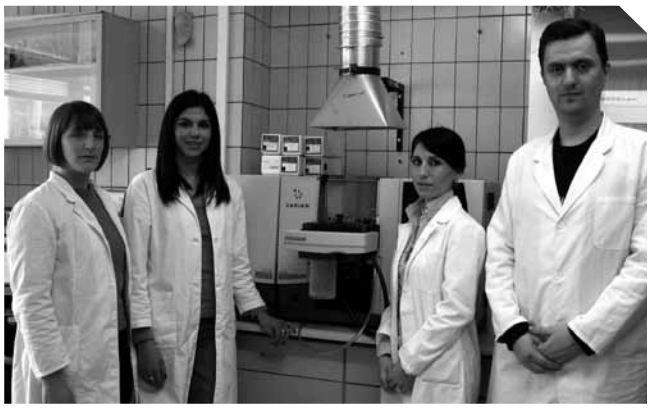
6 See also http://www.becan.eu online.

7 See http://www.wins-ict.eu/index.html online.

The ‘Research Potential’ activity is designed to unlock and develop research potential in the EU’s convergence and outermost regions by helping to strengthen research capacity through support actions. It helps regions acquire research equipment, supports the secondment of research staff, helps in the organisation of workshops and conferences that facilitate the transfer of knowledge, and supports the evaluation of research facilities.

The calls in 2007 and 2008 allowed, for example, for the purchase of an Ultra Performance Liquid Chromatograph measurement instrument necessary to detect chemical contaminants in food by the Laboratory of Chemical Contaminants at the Faculty of Technology in the University of Novi Sad in Serbia. Through further support for training, workshops and networking with other EU leading food safety institutes, the laboratory was recognised as a Centre of Excellence in Food Safety and Emerging Risks (CEFSER). With these qualifications, CEFSER is now capable to contribute to the food safety targets in the ERA and has become an attractive partner for collaborative research. CEFSER is also a member of the Food Cluster Initiative, which consists of 39 cooperating regions with the ambition of building the ERA in food by using national, regional and Community funding.

Four new researchers employed for 34 months at the Faculty of Technology in Novi Sad (Serbia) within the CEFSER project



The Chromatography Laboratory at the Institute of Chemistry in the Faculty of Sciences and Mathematics in Skopje (the former Yugoslav Republic of Macedonia), has also been able to reinforce its food quality control functions thanks to funding under the Research Potential programme, which allowed for the purchase of modern equipment and an analysis by international experts on the quality and efficiency of the research institute. Local wine that previously had to be analysed and tested outside the country, can now have this done by national experts trained by the Chromlab-Antioxidants and Swot-Chemistry-food projects.

Marie Curie Fellowships

Scientists from the Balkans are eligible for Marie Curie Fellowships for training in another EU research laboratory. They can also apply for a Marie Curie fellowship to fund their return to their home country. As the Western Balkan countries are associated to FP7, they are also eligible to apply for training in a third country (Japan or the U.S., for example). To date, scientists from the Balkans have not made much use of, or been successful in the FP7 People Specific Programme.

The programme has however created some Western Balkan Fellows. It allowed, for example, a young scientist born in Split, Croatia to take up a one-year EU Marie Curie Fellowship at the Graz University of Technology in Austria. There he worked on the ‘Advanced Vision-Based Concurrent Localisation and Mapping’ (AViCMaL) project, which set out to establish how a mobile agent such as an autonomous robot could orientate itself using computer vision. The Marie Curie fellowship allowed for training in the use of such a robot, something that the scientist could not have obtained in his country.

Support for integration into ERA

EURAXESS – researchers in motion

EURAXESS is key for enhancing researcher careers. This pan-European (currently 37 members – the 27 EU Member States and 10 of the 12 countries associated to FP7) initiative provides a wealth of information on research careers across Europe, personalised assistance to researchers moving to another European country or returning to Europe, as well as information on rights and obligations of researchers and research organisations. To facilitate the search for information, the EU has set up a network of over 200 Services Centres and a EURAXESS web portal. The portal provides a single entry point for all information related to the key elements of mobility, such as labour market opportunities and vacancies for researchers or fellowships, practical modalities (social security systems, residence permits and family issues), information to ensure fair and open recruitment (European Charter for Researchers and the Code of Conduct for recruitment), and information for scientific diaspora to maintain links with European researchers abroad.

▲ Neven Duic (HR) presenting EURAXESS Croatia at special Workshop for Western Balkans at Conference in Potsdam in March 2009 on Mobility of Scientists

Furthermore, the service centres provide personalised assistance to researchers and their families on practical issues such as visas, work permits, accommodation and legal issues. In other words, EURAXESS ([8]) is the EU's tool to facilitate the free circulation of researchers and ensure brain circulation within the ERA.

Following their association to FP7, the European Commission is providing support to the Western Balkan countries so that they can set up a EURAXESS portal at national level. In Croatia and Serbia the service centres and portals are up and running, and in Montenegro and Bosnia and Herzegovina the launch is foreseen for early 2010.

ERAWATCH

ERAWATCH ([9]) provides information on European, national and regional research policies, actors, and programmes, and covers primarily the 27 Member States. Croatia and the former Yugoslav Republic of Macedonia have already been profiled, including details of each country's research system, funding system and more. Information on the other Western Balkan countries will be available in 2010.

[8] See http://ec.europa.eu/euraxess online.

[9] See http://cordis.europa.eu/erawatch/ online.

OUTLOOK

Hopefully this brochure has given a good idea of what research cooperation with the Western Balkans already offers. If much has been said about research cooperation as a tool to facilitate the future integration of the Western Balkans into ERA and prepare them for accession to the EU, even more could and should be said about scientific excellence in this part of Europe. After all, this is what matters: increasing Europe's scientific capacity and knowledge through cooperation.

Producing excellent research necessitates well-equipped laboratories and multidisciplinary infrastructures. This has almost become a precondition to attracting the best researchers and engaging in collaborative work. But the state of the art requires substantial funding that in many instances cannot be provided by one single country, and indeed it should not be. Research should be conducted in teams and through networking, allowing ideas to be exchanged amongst researchers worldwide. Research infrastructure should be a collective undertaking, involving both public and private partners.

A lack of funding for research is a specific problem in the Western Balkan countries. This is partly due to the huge impact that the war had on the region, but also the effects of the global financial and economic crises, the results of which were felt even more severely in these countries than elsewhere because they have not yet fully made the shift to a knowledge-based economy.

The region is rich in its diversity: it is a melting pot of cultures, each country bordering several others, each with its own unique culture and ideas, and each with its own geographic challenges. Every country has a different level of development, from a GDP per capita of EUR 10 678 (Croatia) to EUR 2 491 (Albania). Levels of R&D intensity as a percentage of GDP also vary, between 0.07% (BiH) and 0.81% (Croatia). One could therefore question whether it is appropriate to treat all Western Balkans as a single bloc and to propose a common set of solutions.

In fact, these figures should encourage the Western Balkan countries to join forces among themselves and with the EU. This is particularly true for investment in research infrastructure as this should, amongst other activities, enable:

- the development of regional centres of excellence closely connected with higher education institutions and the business community;
- the establishment of research infrastructures open to other European researchers;
- the creation of cross-border regional clusters.

Such infrastructure should in turn lead to more advanced training for scientists, encourage mobility and make the science profession more attractive. Support for the development of the research workforce is another challenge requiring attention as a matter of priority in the coming years.

Support must come from all levels, beginning with the national level, because even in times of economic crisis, raising investment in research should be a priority and high on the political agenda. With respect to infrastructure, support at regional level is essential to ensure that researchers have access to large-scale facilities using the latest available technologies. Other stakeholders such as the World Bank, the Bank for Reconstruction and Development and the EIB, who are already very supportive towards developing research capacity in the region, play an important role in this respect. The potential of the IPA to support research capacity at national and regional levels should also be better exploited.

The Joint Statement adopted at the Ministerial Conference in Sarajevo, Bosnia and Herzegovina on 24 April 2009, on developing a regional strategy on R&D for the Western Balkans, reflects well the priorities for action at regional level.

Each of the region's countries is small in size. Each should therefore focus research efforts on a limited number of priorities: it is not possible for all countries to be excellent in all scientific fields. In setting priorities, the focus should be the scientific assets of the countries of the region.

The Western Balkans are, for example, rich in natural resources with many hectares of forest for timber, reserves of iron ore, zinc and mercury, and many lakes and rivers that could be utilised for hydropower. Exploitation requires, however, updated equipment and know-how on technological developments for extraction, as well as economically viable and sustainable processing methods. The lack of access to the newest techniques and production methods prevents the full development of the region's economic potential. Concentrating research efforts in support of industrial and economic development should be another driving force of national S&T strategies.

Strengthening research capacity requires a great deal of effort and is work in progress. At the same time, the innovation dimension – bringing research results faster and closer to the market place – should also be considered. Turning knowledge into new and innovative products and services is another challenge for the region, as it is for the 27 EU Member States.

While there are challenges ahead, the foundations already laid over the past 10 years suggest that the Western Balkan research community will, without a doubt, contribute fully to the objectives of the ERA.

FURTHER READING

Commission Progress Reports for candidate and potential candidate countries:

http://ec.europa.eu/enlargement/how-does-it-work/progress_reports/index_en.htm

WBC-INCO.NET:

http://www.wbc-inco.net

SEE-ERA.NET:

http://www.see-era.net/start.html

SEE-ERA.NET PLUS:

http://plus.see-era.net/start.html

Dall, Elke (ed.),

Science and Technology in the Western Balkans, Wien, 2008.

ISBN 978-3-200-01190-8, Printed by Spolecnost pro odbornou literaturu - Barrister & Principal, CZ 602 00 Brno
http://www.spol.org

She figures and the report

'Benchmarking policy measures for gender equality in science – 2008'

http://ec.europa.eu/research/science-society/document_library/pdf_06/benchmarking-policy-measures_en.pdf

Factsheet by UNESCO

on trends in number of researchers in developing and developed countries

http://www.uis.unesco.org/template/pdf/S&T/Factsheet_No2_ST_2009_EN.pdf

European Commission

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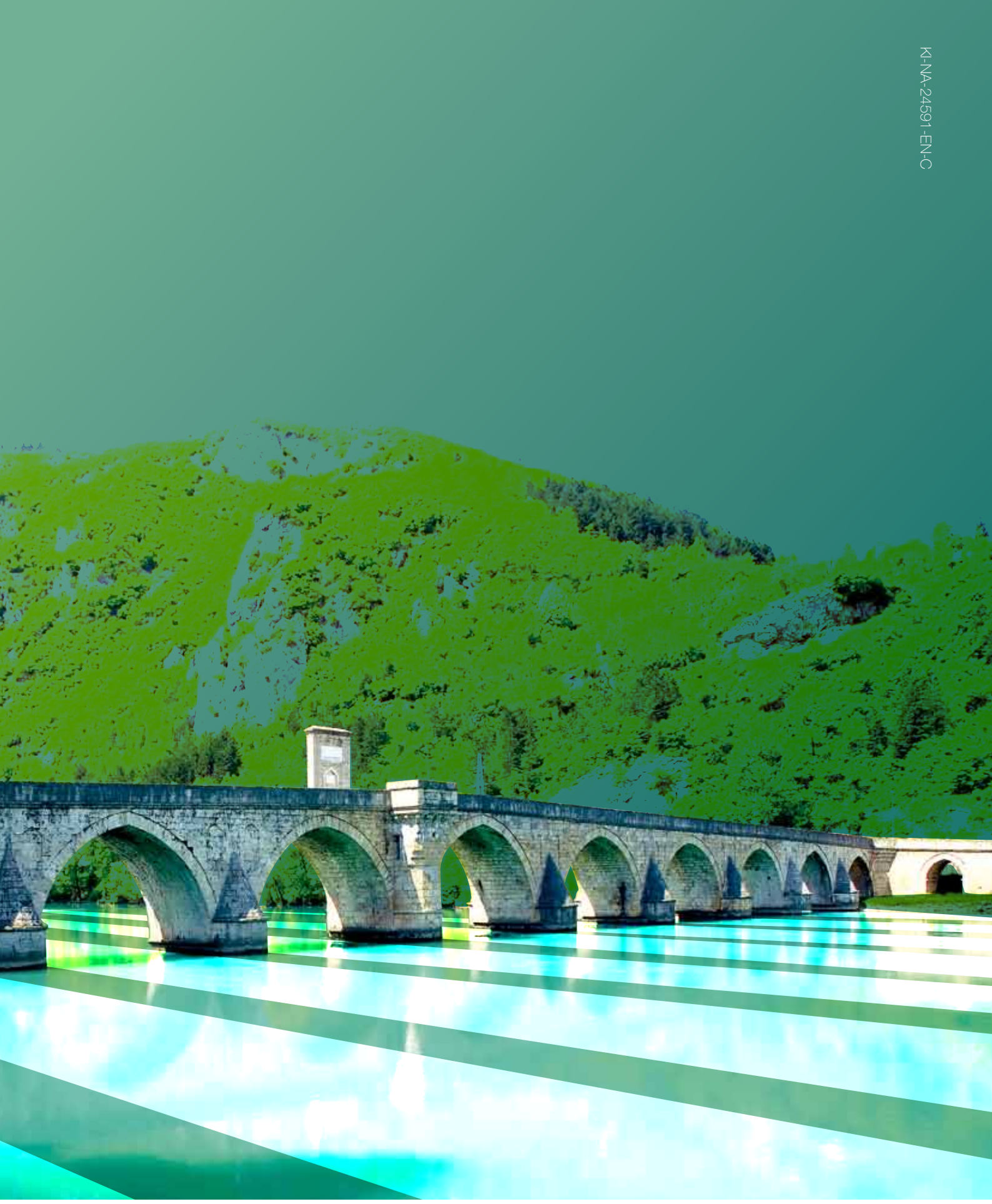

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