

Screening report

Republic of Serbia

Chapter 25 – Science and Research

Dates of screening meetings:

Explanatory meeting: 4 October 2014

Bilateral meeting: 1 December 2014

I. CHAPTER CONTENT

The areas of research and technological development are governed by Title XIV (Articles 179 to 190) of the Treaty on the Functioning of the European Union (TFEU). Promotion of scientific and technological advance is an objective of the Union, with a specific legal basis on the European Research Area aiming at free movement of researchers, scientific knowledge and technology. Acting on research and technological development is done on the basis of shared competences - the Union has competence to act in so far as the exercise of its competence does not prevent Member States from exercising theirs.

The *acquis* in Chapter 25 – Science and Research – does not require transposition of EU rules into the national legal order.

The *acquis* requires Member States to ensure the necessary implementing capacities to pursue the EU objectives and activities in the field of research and innovation. Member States need to adhere to and implement specific science and research objectives and activities as developed by the open method of coordination. Implementation capacity relates to the existence of conditions necessary for the effective participation in the Union's programmes on research and innovation including a good administrative capacity. It also requires good research and innovation capacity at national level so as to contribute to Europe's scientific excellence, competitiveness and growth in line with the targets and actions identified in the Innovation Union flagship including the European Research Area (ERA) and the Europe 2020 strategy. In this context, the level of investment in research as a percentage of GDP compared to the EU target of 3% is a key indicator to measure progress. Equally important are measures to strengthen human capital building, modernising the infrastructure and creating the right framework conditions to facilitate integration into the ERA.

In addition, the EU has concluded a number of international, bilateral and multilateral, agreements on science, technology and nuclear research, which need to be implemented in coordination with Member States.

For the implementation of the Union's framework programmes, the Framework Programme for Research and Innovation 2014-2020 (Horizon 2020) and the Research and Training Programme of the European Atomic Community 2014-2018 (EURATOM), the Commission is assisted by specific Programme Committees. For the policy actions, coordination and advice take place in the European Research and Innovation Committee (ERAC).

Finally, a number of ad hoc decisions in specific areas exist, such as on agricultural research governed by the Standing Committee for Agricultural Research (SCAR), the Research Fund for Coal and Steel and actions and undertakings on the basis of Article 185 and Article 187 of the TFEU aiming at strengthening EU research efforts on specific research issues.

II. COUNTRY ALIGNMENT AND IMPLEMENTATION CAPACITY

This part summarises the information provided by Serbia and the discussion at the screening meeting.

Serbia stated that it can accept the *acquis* regarding Science and Research and indicated that it does not expect any difficulties to implement the *acquis* by accession.

II.a. Policy on Research and Innovation

Institutional framework

The Ministry of Education, Science and Technological development (MESTD) is the main body in charge of science and research in Serbia both for funding research activities and designing and implementing the strategy on research and innovation. The MESTD is responsible for the negotiation and implementation of international agreements on science and technology including the association agreement to the Union's programme on research and innovation Horizon 2020.

The government is assisted by the National Council for Scientific and Technological Developments (NCSTD), which has an advisory role in preparing and proposing science and research strategies and actions and consults for that purpose with all relevant stakeholders. The NCSTD is an independent body under the administrative management of the MESTD consisting of a Chairperson and sixteen members (representing academics, scientists, universities and business sector) appointed by the government for a period of five years.

In addition, for the Autonomous Province of Vojvodina, the Provincial secretariat for Science and Technological Development is in charge of designing, funding and implementing actions on research and innovation at regional level.

National funding

The funding of research and innovation activities is governed by the Law on Scientific Research Activity, the Law on Innovation Activity, the Strategy of Scientific and Technological of the Republic of Serbia 2010-2015 and the Action Plan for Strategy Implementation.

Serbia has identified seven national thematic areas¹ for prioritized funding. In addition, Serbia is funding basic research and technological development, financing innovation activities and co-funding integrated and interdisciplinary research. Serbia stated that the type of actions and thematic areas funded by Serbia are similar to the funding areas under Horizon 2020, in particular under Pillar 3 on Societal Challenges.

Funding decisions are taken on the basis of competitive calls and evaluated by national experts and often by international experts, taking into account the competence of the project leader and members in the proposal, the impact of the project, the competence of the accredited organisation implementing the project, wider social significance and connectivity with the economy. Only accredited and registered scientific research organisations and registered innovation organisations can submit proposals and obtain funding. The duration of projects varies between five years (basic research) and six months (innovation). The average success rate for research programmes is 87.5 % and 38% for innovation projects. Funding per project, depending on type of programme, ranges between EUR 90.000 and EUR 8.8 million.

Besides the funding of research by the MESTD, other Ministries (i.e. Health, Energy and Agriculture and Environment) finance research activities.

¹ Bio-medicine and health; new materials and nano-sciences; environmental protection and climate change; agriculture and food; energy and energy efficiency, information and communications technologies and improvement of decision-making and affirmation of national identity.

International Scientific and Technological Cooperation

Serbia has concluded scientific and technological cooperation agreements with several Member States and third countries, in particular with its neighbours. It is in the process of concluding (or re-activating) further international agreements with a number of third countries in the near future.

At Multilateral and inter-governmental level, Serbia is cooperating under COST (European Organisation for Science and Technology), EUREKA, NATO and European Organisation for Nuclear Research (CERN). At regional level, Serbia signed the Western Balkans Regional Research and Development Strategy for Innovation in October 2013 in Zagreb aiming at strengthening the capacity at Regional level through joint efforts governed by the Western Balkan Research and Innovation Facility called WISE.

II.b. Framework Programmes

EU Framework Programme

In the Sixth Framework Programme for Research and Technological Development (2002-2006), Serbia participated as a third country. In 2007, Serbia became associated, through a Memorandum of Understanding, to the Seventh EU research and technological development programme (2007-2013) (FP7) and in July 2014, the association agreement to Horizon 2020 was signed with retro-active effect as from 1 January 2014.

Serbia has nominated representatives in all Horizon 2020 programme committees and attends on regular basis the meetings as observer. Serbia has developed a network of National Contact Points (NCPs) including representatives from the MESTD, universities and the private sector. Serbia organises at regular intervals info-days and promotion activities on Horizon 2020 as well as general science promotion activities. Representatives from Serbia participate in Horizon 2020 networking events with Member States and regional partners.

Serbia has nominated a representative in the European Research and Innovation Area Committee (ERAC) and attends regularly meetings as an observer.

EURATOM Framework Programme

Serbia has so far limited experience in cooperation on nuclear research under the Euratom Treaty and is not associated to the Research and Training Programme of the European Atomic Community (the Euratom Programme 2014-2018).

At national level several public institutes are conducting nuclear research mainly in the fields of nuclear safety, radioactive waste management and radiation protection. Serbia is not engaged in fusion research. Serbia is an associated member of CERN.

Cooperation with the Joint Research Centre

Serbia is cooperating with the Joint Research Centre (JRC) and has for this purpose concluded in February 2010 a Memorandum of Understanding identifying areas for increased cooperation.

Through its association to Horizon 2020, Serbia has been invited and nominated an observer in the Board of Governors of the Joint Research Centre.

Rules of Ethics

Serbia stated that it is complying with the rules of ethics as set in the rules of participation under Horizon 2020.

Prior to national funding, all projects are subject to ethical evaluation conducted by the MESTD; project proposals undergo an evaluation by the ethics committee composed by two international and one national expert and during the project lifecycle, projects are monitored on an annual basis by the MESTD. Review is conducted on the basis of the Constitution of the Republic of Serbia (Articles 24 and 25) and the different laws determining the freedom and autonomy of scientific research/scientific freedoms and conditions to respect when conducting research on given areas. Serbia stated its intention to further streamline the system in order to take better into account various opinions issued by ethical commissions of universities and other public bodies.

II.c. Innovation Union including European Research Area

Actions relating to the 3% objective

The national budget for research is determined by the National Budget Law. In 2012, the public budget for research, development and innovation, allocated to and implemented by the MESTD, amounted to EUR 107 million or 0.48% of Serbia's GDP. The total GERD in 2012 amounted to 0.97% of GDP of which 0.45 % from business expenditure. This result is lower than Serbia's own target of reaching 1.05% of GDP by 2015.

There is no specific plan to increase public research funding. Serbia intends to take, as a matter of priority, measures to stimulate investment by the private sector. Serbia intends to engage in the Smart Specialisation Strategy as a way to link better research to the economy. It also expects the new strategy "Research for Innovation 2020", under preparation, to boost investment in research. Finally it also expects funding from other sources, notably from its participation in Horizon 2020 to raise the research intensity.

Actions relating to mobility of researchers

Serbia follows closely the actions taken at EU level on mobility of scientists and human capital building addressed in the Steering Group on Human Resources and Mobility (SGHRM) and the Human Resources Strategy for Researchers (HRS4R). Serbia has nominated delegates in both ERA Groups responsible for analysing and implementing human resource strategies.

The number of registered scientists in 2013 amounted to 12.555 which is equivalent to 9.294 full-time employments (FTE); from the total workforce, 0.5% employed people are scientists. Serbia is suffering from an ageing scientific population (average 44.3 years) and from brain drain. There are no official statistics on the number of scientists abroad, although a recent study estimates the number at 6.000 in the US and 4.000 in the EU.

To increase the number of scientists, Serbia is taking a limited number of measures notably by supporting PhD students doctoral programme focussed on industrial innovation. Serbia promotes scientific careers, notably through Science Festivals; summer schools or thematic events (May Month of Mathematics; Days of Future on Robotics). With respect to diaspora, the government gives support for short return visits and has a programme to motivate Serbian diaspora to return to the country but in the absence of a good data base of diaspora the outreach of the measures is limited.

The Serbian Euraxess portal is operational and offers services to ensure mobility of scientists. The University of Nis is the Bridgehead organisation. Five research organisations have endorsed the

principles of the European Charter for Researchers and Code of Conduct for the Recruitment of researchers and in March 2015, the University of Nis received the HRS4R Logo.

Research infrastructure:

Infrastructure is managed by the MESTD and the Project Implementation Unit (PIU), a limited liability company and body under MESTD responsible for investment in science equipment and infrastructure buildings. The MESTD supports smaller equipment and material; innovation infrastructure, acquisition of foreign literature and training activities. PUI was established in 2010 to implement a loan of EUR 200 million from the European Investment Bank. In addition, funds are also provided by the Council of Europe Development Bank, by contributions from national institutes and through some funding from the Pre-Accession Instrument (IPA).

Serbia has nominated a delegate member in the European Research Forum on Infrastructure (ESFRI) but is attending on irregular basis the meetings.

Serbia has not provided a ESFRI Research Infrastructure Roadmap, but it compiled a partial inventory of existing equipment. The ESFRI Roadmap is under preparation and should be available in the course of 2016.

Actions relating to Science with and for Society (SWAFS):

A Centre for the Promotion of Sciences (CPS) was established by the Law on Scientific Research in 2010. The CPS organises on regular basis seminars; round-tables and events to promote sciences; it keeps records of scientific societies and supports the government in promoting Horizon 2020.

The CPS is responsible for the implementation of the SWAFS principles relating to gender; ethics; open access; science education; governance; engagement and science communication. The CPS represents Serbia on the H2020 Programme Committee SWAFS and Societal Challenges.

As far as gender is concerned, gender equality is guaranteed by the Constitution and regulated by the Gender Equality Act of 2009. About 50% of the total number of persons employed in science are women. However, the employment of woman at higher level is lower (e.g. out of 61 research institutes, 14 women directors and of the 16 universities, only two are rectors).

Actions relating to Innovation Union

The MESTD is responsible for designing and financing innovation activities. Actions to stimulate innovation are mainly governed by the Law on Innovation Activity and implemented by six accompanying bylaws establishing and regulating the Innovation Activity Register and conditions for public funding of innovations. The national Strategy of Scientific and Technological Development defines the objectives and conditions for promotion of applied science by establishing national innovation systems through partnerships between research organisations and industry.

The Law on Innovation Activity established an Innovation Fund providing funding for innovation. The Fund is a public independent body operating under the surveillance of the MESTD. The Fund manages the financing and seeks funding opportunities from international and domestic institutions and private sector. Between 2011 and 2014, it has funded in total 53 projects (mini grants and matching funds) out of 471 applications (success rate of 11.5%).

Support for innovation resulted, amongst others, in new innovative products, patents and international partnerships and operations of incubators and hubs at universities stimulating entrepreneurship among the young.

Transfer of Knowledge and Intellectual Property Rights (IPR)

Through the Law on Innovation Activity, Serbia supports cooperation between Research Organisations (ROs) and SMEs aiming at strengthening the patenting and the transfer of knowledge towards industry. Since 2005, nine Science and Technology Parks and Business Technology incubators have been established and since 2010 four Technology Transfer offices have been established within the Universities.

In 2013, there were 201 national patent applications. They mainly came from private individuals (151), followed by the industry (31) and public research institutions (19). A database of citations across domestic journals is prepared by an NGO Centre for Evaluation in Education and Science (CEES).

Serbia nominated a representative in the Working Group on Transfer of Knowledge (a sub group of ERAC) who has not attended meetings, yet.

Bio-economy and Agricultural Research

In the Strategy on research and technological development, research in the area of bio-economy is recognised as a priority. In 2012, Serbia adopted a Strategy for the sustainable utilisation of natural resources and goods. The country counts seven research centres/institutes dealing with bio-economy. Under FP7, Serbia was successful in the thematic area Food, Agriculture and Biotechnology compared with results in other thematic areas.

In 2009, Serbia nominated a national expert in the Standing Committee on Agriculture Research (SCAR) who attends meetings on irregular basis.

Tackling climate change, sustainable development and biodiversity: towards a circular economy

At national level, limited funding relates to climate change as such or research on sustainable development or bio-diversity. Such research is funded on an *ad hoc* basis through the Co-Funding of Integrated and Interdisciplinary Research (IIIR) programme of the current national research strategy.

European Research Fund for Coal and Steel (RFSC)

Research on coal relates to technological development in area of mining, energy and energy efficiency consisting of two groups of about 45 researchers. Steel research is almost non-existing: institute for metallurgy, linked to the steel mill Železara Smederevo, closed in 2004; no other specialised research institute on steel exists. Some research on steel is carried out at the Faculty of Technology and Metallurgy at the University of Belgrade.

Article 185 and 187 Initiatives

Serbia has so far participated in 5 ERA-Net projects, most notably in the SEE-ERA.NET (2007-2009) and the SEE.ERA.NET PLUS (2010-2012).

Serbia has expressed interest in a number of ongoing Article 185 initiatives, notably the Eurostars 2, aiming at strengthening the capacity for Eureka membership, the Active and assisted Living Research and Development programme (AAL 2), the European Metrology Research and Development Programme (EMPIR) and the European-Developing Countries Clinical Trials Partnership 2.

III. ASSESSMENT OF THE DEGREE OF ALIGNMENT AND IMPLEMENTING CAPACITY

Overall, Serbia has reached a good level of alignment with the *acquis* and has capacity to implement it.

In order to prepare for the full application of the *acquis*, Serbia will need to take a number of additional actions and adjust and update the existing measures. Serbia will need to ensure continuous and adequate availability of budgetary resources and a legal framework conducive to private sector investment. Serbia furthermore needs to undertake actions to facilitate the integration of its research institutes and innovation actors into the European Research Area by strengthening the capacity of its research infrastructures and science facilities. Serbia will also have to take more actions to stimulate innovation in line with the Innovation Union commitments. Serbia should also render the funding at national level more competitive and fund multi-disciplinary research including innovation actions so as to cover the entire chain from the research lab to the market.

III.a. Policy on Research and Innovation

Serbia is well aware of the importance to design and implement a comprehensive strategy on research and innovation and takes into account the developments, actions and best practices established at EU level.

Serbia is already taking many actions to strengthen its research and innovation capacity: it has a national strategy on research and technological development; it has a law on innovation and an innovation fund; it is funding both fundamental and applied research in areas corresponding to EU priorities. At the same time, several actions have been implemented with delay due to lack of administrative capacity and lack of national funding.

Reforms are necessary to increase the degree of competitive funding and concentrate research efforts to create a critical mass and leverage both at regional and European levels on research issues of mutual interest for Serbia and the EU and to address common challenges such as climate change or energy efficiency, while complying with the rules on ethics. This is particularly relevant for the successful participation in the Union programme on research and innovation Horizon 2020.

III.b. Framework Programmes

EU Framework Programme

As a country associated to the EU research framework programmes for the entire period (2007-2013), Serbia has acquired good knowledge regarding the cooperation with EU Member States, established a good administrative capacity and achieved a good level of participation of its researchers. Further efforts are required to increase scientific excellence in general, increase participation of SMEs, involve more industry and support more multi-disciplinary research to ensure good participation in the societal challenges. Given the size of the country, efforts should be focussed. Therefore, Serbia should start designing a Smart Specialisation Strategy.

EURATOM Framework Programme

Serbia has demonstrated some activity and potential in the field of nuclear research. It is willing to participate in research cooperation opportunities under the EURATOM programme in preparation of its full participation upon accession. Substantial efforts will be necessary to increase the research capacity on nuclear research and compete at EU level.

III.c. Innovation Union including European Research Area

Serbia has started to take actions on most ERA priority actions and contributed on a voluntary basis to the 2014 European Research Area progress report. Additional efforts are necessary to further comply with key ERA priority actions, notably on funding modalities and research topics at national level, mapping of infrastructure, stimulating transfer of technology and adhering to principles of open recruitment of scientists. Serbia needs to step up investment in research, both from the private and the public sector, and monitor progress made to meet its own national targets.

Bio-economy and agricultural Research

Research on biotechnology and agriculture is a priority for Serbia. On that basis, Serbia is prepared to contribute to the EU objectives on bio-economy and the agenda on agricultural research.

European Research Fund for Coal and Steel (RFSC)

Participation in the RFSC is reserved to Member States only. Serbia has potential to participate in research actions on steel and coal under the RFSC.

Article 185 and 187 Initiatives

Serbia is not yet a formal member of any of the EU Article 185 or 187 initiatives and undertakings but has expressed interest in increasing research efforts in areas of strategic importance with a view of joining such initiatives. Since it has already participated in ERA-Net projects, notably SEE-ERA.NET, it has experience in joint programming and funding of research projects in areas of common interest.