

*Olga Stevanović\**

*Institute for Political Studies, Belgrade*

## **THE EU RESEARCH AND INNOVATION POLICY AND INTEGRATION OF THE REPUBLIC OF SERBIA INTO THE REFORMED ERA\*\***

### **Resume**

This paper addresses the subject of the EU research and innovation policy in the context of the European Research Area reform, with special focus on its external aspect. The first goal of this paper is to describe the leading developments in research and innovation which have taken place in the last decade, with emphasis on their significance for the EU integration process. Starting from Leuffen et al's concept of external differentiation, in this paper the ERA is considered a policy regime which expands beyond the EU borders. Consequently, the second goal of the paper is to present the Serbian research and innovation policy with respect to the ERA integration after the chapter on science and research was provisionally closed. Through thematic analysis of research and innovation strategies, this paper will discern if Serbian R&I policy

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\* E-mail address: [olga.stevanovic@ips.ac.rs](mailto:olga.stevanovic@ips.ac.rs).

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converges with the priorities and guidelines of the new ERA, thus rendering it a part of the broader European research landscape.

**Keywords:** EU, European Research Area, research and innovation policy, Serbia

## INTRODUCTION

The EU research and innovation (hereinafter: R&I) policy has gained salience in light of the ongoing processes of technological development and various new challenges in the last decade. Accordingly, this policy area became a more prominent subject of interest in the academic literature.<sup>1</sup> The European Research Area (hereinafter: ERA) has been reforming since 2018 (EC 2023a), which reflects the relevance of R&I in the EU. Taking into account that the geographical scope of the ERA exceeds the territorial borders of the EU (Leuffen et al. 2022, 25), this policy reform has an impact on countries and other pertinent actors across Europe. Moreover, the new ERA has a noticeable “geopolitical dimension” (e. g. EC 2020a, 22), which puts into attention the external aspect of the EU R&I policies. Considering that Serbia is a candidate country for the EU membership, is an associated country of the EU Framework Programme (FP), as well as that the Chapter 25 – Science and research – was the first one provisionally closed in the process of negotiation,<sup>2</sup> this paper addresses the question of convergence of Serbian R&I policy with the guidelines of the reformed ERA. We find that the R&I policy of the Republic of Serbia (hereinafter: Serbia) can be considered in the context of the EU integration process, especially the integration of Serbian R&I system into ERA, with acknowledgment of preferences and interdependence of both sides in this policy area. However, we will primarily focus on the research component of this policy, considering the scope of the paper.

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<sup>1</sup> According to the analysis done by Queirós and Carvalho (2019, 4), science, technology and innovation policies represent “a consolidated strand of research”, however the Europeanization of research and innovation is still an understudied subject in the academic literature (4).

<sup>2</sup> Only two chapters were provisionally closed in the negotiation process so far, one of which is Chapter 25, on December 13, 2016 (EC n. d. a).

This paper proceeds as follows. The first part of the paper presents approaches to the EU external R&I policy, with special focus on the context of the EU integration process. The second part of the paper presents the ongoing reforms in the EU R&I policy, particularly the ERA reform, with a subsection dedicated to the relevant strategic documents in this policy area. The third part of the paper addresses the Serbian R&I policy in the context of EU integration, including a subsection on pertaining Serbian strategic documents with emphasis on areas of convergence.

## ANALYTICAL FRAMEWORK OF THE PAPER

There are a few approaches to the EU external R&I policy that can be taken into consideration, and this section briefly discusses the theoretical concepts applied in different approaches.<sup>3</sup>

First of all, R&I can be viewed as *a form of power* that can be projected beyond the EU borders. For instance, Mitchell Young and Pauline Ravinet make a case for Europe as a “knowledge power”,<sup>4</sup> as opposed to the EU as a normative or market power (Young and Ravinet 2022, 982–983).<sup>5</sup> Research and innovation can also be related to the EU’s common security and foreign policy, especially in the context of global challenges the EU is facing, in which “knowledge is growing, and becoming more explicit” (Young and Ravinet 2022, 987). They can therefore be considered *instruments of EU’s external action* as well (Tocci 2017, 38).<sup>6</sup>

<sup>3</sup> Queirós and Carvalho (2019, 5) enumerate five general themes in the discussion on Europeanization of science, technology and innovation policies from 2000 to 2018 – “ERA Framework”, “Convergence”, “Collaboration”, “International Mobility” and “Universities Mission”.

<sup>4</sup> This concept of “knowledge power” (Young and Ravinet 2022) can be linked with the power of producing meaning and knowledge through discourse (Vukasović 2021, 16), especially construction of the international identity in terms of the EU’s expertise in R&I (Young and Ravinet 2022, 990) which can relate to “the discourse of the EU as an ideal model/normative power” (Vukasović 2021, 21). Similarly, Gengnagel et al. (2022, 1586) point to the “symbolic power” stemming from the social scientific discourse proposed by the EU, which in return “affirm[s] and legitimate[s] the authority of the EU”.

<sup>5</sup> The 2021 Strategy for international cooperation in R&I reiterates the EU’s determination to “lead by example” (EC 2021a, 1, 2) in R&I cooperation by creating a system which relies upon rules and values presented in the European Pact for R&I (EC 2022a, 3) which can be connected to the “knowledge power”.

<sup>6</sup> The Strategy on international cooperation in R&I precisely mentions the concept of science diplomacy as a way of projecting soft power, interests, and values of the EU (EC 2021a, 4).

Another strand of literature is based on a similar, yet narrower approach as it focuses on *the science diplomacy*, a concept defined as “supporting from a scientific–technical perspective the definition and achievement of foreign policy objectives (science in diplomacy), facilitating international scientific cooperation (diplomacy for science), and using international scientific cooperation to improve relations between different countries (science for diplomacy)” (Royal Society and AAAS, 2010 in Arnaldi 2023, 9), also accepted in this formulation by the EU (EEAS 2022). It is, however, in Pierre-Bruno Ruffini’s opinion different from international scientific cooperation, since it necessarily involves promoting specific scientific or non-scientific interests of a certain polity (Ruffini 2023, 21; 24). Similarly, according to Young (2023, 38–39) EU uses science diplomacy with two goals – scientific and “as a part of its foreign policy and global strategy”. As Young (2023, 37) points out, even though some forms of science diplomacy have been present since the 1950s, the novelty of current usages of science diplomacy is its interpretation as a foreign policy instrument.<sup>7</sup>

Having acknowledged the external aspect of this policy area, but also considering that Serbia has been an associated country of Horizon 2020/Horizon Europe, this subject can be treated from the standpoint of integration theories. Specifically, the concept of *external differentiation*, concocted by Leuffen, Rittberger, and Schimmelfennig (Leuffen et al. 2022) can be of use in this regard.<sup>8</sup> External differentiation refers to situations where EU rules are adopted by both Member States and states beyond the EU borders (Leuffen et al. 2022, 38). Even though more authors focus on *de iure* differentiation, there are cases of *de facto* differentiation (Schimmelfennig 2023, 6; Princen et al. 2022, 5), which is a relevant point in this case.<sup>9</sup> This concept allows the process of European integration to be considered at the level of a particular policy instead of the whole EU (Leuffen et al. 2022, 56). Secondly and more importantly, it can be applied to both members and non-members, which is important

<sup>7</sup> Horizon Europe introduces the possibility of limitation of participation in the framework programme in order to safeguard the EU’s strategic assets, interests, autonomy or security”, which can be interpreted as a foreign policy instrument (EC 2023c).

<sup>8</sup> Čeranić (2018, 66) points at renewed relevance of the concept of differentiated integration in the context of Brexit and conflicting trends of integration and disintegration.

<sup>9</sup> Although participation in the FPs is regulated by the Association Agreements, there are other informal rules pertinent to this policy area.

considering Serbian status. Similarly, when talking about the “forms of integration into the European system of rules that remain below the threshold of membership”, Lavenex and Schimmelfennig (2009, 792) have also used the concept of *external governance*.

This involves a distinct perception of the EU as a “system of differentiated integration” (Leuffen et al. 2022, 38). Leuffen et al. (2022, 40) suggest there are different “policy regimes” which include both EU Member States and non-members. Similarly, Trondal et al. (2022, 27) conceive the EU as “an institutionally polyarchic architecture of concentric circles” consisting of core members, members with opt-outs, candidate countries and different neighborhood arrangements. Hence, we consider the new ERA an emergent policy regime or one of the concentric circles, especially after the 2018 reform which accelerated the integration of R&I policies across Europe. However, considering that the R&I policy still entails “flexibility in implementation”, a certain level of differentiation is expected.<sup>10</sup> In accordance with this, we propose that Serbia is already a part of it through voluntary rules compliance and participation in the EU programmes and expect to find evidence that Serbia’s R&I policy has continued to reform after the negotiation of Chapter 25 with the goal of further integration into the ERA, thus rendering overall convergence with the EU R&I policy, albeit with certain areas requiring further development.

## THE EU RESEARCH AND INNOVATION POLICY AND THE ERA REFORM

The European Research Area was created in 2000 with the goal of integrating national research systems and it progressed towards creating an internal market in the field of science, research, and innovation (EC 2020b, 2).<sup>11</sup> Even though this policy area remains in the competence<sup>12</sup>

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<sup>10</sup> According to Princen et al. (2022, 2) “flexibility in implementation” involves “giving Member States discretion during implementation” which, if put into effect, results in “differentiated implementation”.

<sup>11</sup> According to Leuffen et al. (2022, 41) the level of vertical integration in the research and development (innovation) area has evolved from 1958 to 1987 (0 to 3.5), and in 1999 to 4 out of 5 (ordinary legislative procedure).

<sup>12</sup> According to the Treaty on the Functioning of the European Union, the EU has competences in defining and implementing programmes, as long as it doesn’t prevent Member States in carrying out their activities regarding science and technological development (TFEU, art. 4, sec. 3). The activities of the EU are meant

of Member States and associated countries, it can be argued that the EU authority has expanded since the creation of the ERA.<sup>13</sup> Consequently, the ERA was promoted into an objective of the EU in 2009 (EC 2020b, 2; TFEU, art. 179, sec. 1). Additionally, this stance is based on various recommendations, communications, and other forms of “soft law” designed to govern this policy area,<sup>14</sup> proposed and new institutionalized bodies in R&I, and stricter monitoring of the implementation process. This change reflects the growing relevance of the R&I policy area, first in the context of “knowledge economy” (e. g. Corbett and Hantrais 2023, 4; Young and Ravinet 2022, 985), and most recently with regard to new challenges such as Brexit, Covid-19, and the global energy crisis spurred by the war in Ukraine (EC 2023b, 10).<sup>15</sup> Hence, the 2022 *Science, R&I Performance of the EU* report puts R&I into the center of “social, economic, and environmental sustainability” (Hobza et al. 2022, 5).

Last decade witnessed a more prominent role of the EU in guiding and monitoring the implementation of ERA on national level. Prior to the official reform process, *ERA Roadmap 2015-2020* was first introduced in 2015 by the European Research Area and Innovation Committee (ERAC) to “guide Member States [and Associated Countries (ERAC 2015, 2)] in structuring their implementation of ERA at national level” (ERAC 2015, 2). With respect to the ERA countries’ autonomy (ERA 2015, 3), ERA Roadmap relied upon flexibility, but also provided examples and recommendations on specific actions regarding ERA objectives. Furthermore,

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to complement the member states’ activities in research and development (TFEU, art. 180), and they are meant to be coordinated and mutually consistent (Art. 181). The EU activities can be summed up as implementation of programmes in this field, promotion of cooperation, dissemination of research results and promotion of mobility (Art. 180). Those activities are carried out through a “multiannual framework programme” (Art. 182).

<sup>13</sup> Similarly, Katri Eeva’s study puts into focus educational policy at the EU level, a policy area akin to R&I, suggesting that there’s “more regulated EU-wide soft policy coordination in the field of education” (Eeva 2021, 2).

<sup>14</sup> The EU soft law is defined as “a non-binding EU instrument with the potential to exert influence on Member States, but [is] not subject to enforcement by supra-national institutions” (Zhelyazkova et al. 2023, 450). Some forms of the soft law in the EU include “codes of conduct, resolutions, communications, declarations, guidance notes and action plans” (Cappellina et al. 2022 in Zhelyazkova et al. 2023, 449).

<sup>15</sup> Radaelli (2022, 13) suggests that crises can be an “explanatory variable of integration”, as they can lead to more (or less) integration based on policy learning during crisis (18).

it included a monitoring mechanism (EMM), although only in Member States (EC, and Whittle et al. 2022). Since 2016, ERA countries have adopted National Action Plans in accordance with the ERA Roadmap, and specifically with ERA priorities (EC, Whittle et al. 2022, 26).<sup>16</sup>

The ERA reform which has started in 2018, also entails a more detailed approach of the EU to the area of R&I. First of all, there are several documents which contain priorities, goals, rules of conduct and recommendations. Most importantly, the EC Communication on the new ERA provided a base for the reform of R&I policy area (EC 2020b). Secondly, specific values R&I should strive for are listed for the first time in the new *Pact for R&I in Europe*.<sup>17</sup> Even though these documents aren't legally binding, they have certain effects (Capellina et al. in Zhelyazkova et al. 2023, 449). Concomitantly, the strategic documents issued by the Commission's Directorate-General for Research and Innovation – Strategic Plan 2020-2024 and ERA Policy Agenda – elaborate what was broadly set out in the Communication, so planned policy priorities and actions reflect the reformed ERA guidelines (EC 2020a, EC 2023a).

The new ERA also suggests greater horizontal integration. First, there are certain alterations in the ERA governance, with a new governance body *ERA Forum for Transition*, designed to ensure inclusiveness of the EU, Member States, associated countries and other interested parties, in the process of designing, implementation and monitoring the ERA policy agenda (EC 2023a).<sup>18</sup> The prior constraint of the ERA implementation monitoring in all participating countries should be resolved with this body. Secondly, Horizon 2020 was available to associated countries, while Horizon Europe, as a FP which replaced it, has been available to both associated countries and a broader range of interested

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<sup>16</sup> This study presents in great detail the impact of ERA Roadmap to research and innovation systems of select countries, including potential areas for further improvement. See more in (EC, and Whittle et al. 2022).

<sup>17</sup> Values and principles on research and innovation, as proclaimed in the Pact for Research and Innovation, are: "Ethics and integrity of research and innovation; Freedom of scientific research; Gender equality and equal opportunities for all; Free circulation of researchers, staff, knowledge and technology; Pursuit of excellence; Value creation and societal and economic impact; Coordination, coherence, commitment; Global outreach; Inclusiveness; Societal responsibility" (EC 2022a).

<sup>18</sup> According to Eeva (2021, 1–2) "compliance develops when actors feel that they are co-constructing policy". Similarly, Lavenex and Schimmelfennig (2009, 796) talk about the expansion of the EU rules "in a more participative manner" through external governance.

countries beyond Europe (EC n. d. b; EC 2023c). Agreements on association to the FPs imply equal access and conditions for participation of the EU Member States and non-members' legal entities (EC n. d. b; EC 2023c). Additionally, Horizon Europe is an instrument for policy alignment and sharing access to knowledge, researchers and infrastructure between Member States and associated countries (EC 2021a, 3). These countries pertain to the same policy regime in R&I, nevertheless their official member status. Consequently, countries associated with Horizon 2020/Horizon Europe are deemed "an integral part of the ERA" (EC 2020b, 18) and designated as the "ERA countries" (EC 2019a, 5). In line with this, five respondents from Serbia were included in the consultation for the Horizon Europe Strategic Plan 2025-2027 (EC 2023b, 35). Finally, the participation in the ERA is presented as a facilitating factor in accession to the EU. This is particularly mentioned with regard to the enlargement policy and the Western Balkans (EC 2020b, 18; EC 2020a, 22).

### **The Strategic Plan 2020-2024 and the ERA Policy Agenda 2022-2024**

There are several documents pertaining to the reformed ERA, but two of them deserve further attention in this paper – DGRI's Strategic Plan 2020-2024 and the ERA Policy Agenda 2022-2024 (hereinafter the Strategic Plan and the Policy Agenda, respectively). Therefore, this subsection of the paper is dedicated to the thematic analysis of those documents, with the goal of presenting and describing the most prominent themes these documents entail, so they can be compared to the focal points of Serbian R&I strategy later on.

In line with aforementioned salience of R&I policy and its enhanced role in achieving economic, social, and environmental goals, the Strategic Plan is structured to address objectives of Von Der Layen's Commission (EC 2020a, 6). The Policy Agenda is structured around four priority areas of the ERA. Although both documents entail similar themes, they are differently formulated, so the Strategic Plan is mainly directed at potential application of R&I results, whereas the Policy Agenda is more focused on the policy area of R&I itself. The themes are also organized in different order, considering the Strategic Plan prioritizes social challenges, while the Policy Agenda puts the R&I system integration first. In other words, the Strategic Plan defines the overall objectives and course of action, whereas the Policy Agenda precisely enumerates specific measures.



Taking into account the context it originated from, the twin energy and digital transition has a central place in the Strategic Plan (EC 2020a, 10). Specific goals in the first objective (“A European Green Deal”) reflect the EU’s efforts to transition to clean energy, and position R&I in the centre of this. Accordingly, they encompass innovative solutions in service of preserving “biodiversity, ecosystem and natural resources” (EC 2020a, 12), directing budgetary expenditures and investments towards the climate (13), and using instruments of missions and partnerships within Horizon Europe (12–13). The second general objective of the Strategy (“A Europe fit for the digital age”) also rests upon the R&I area as a pillar for achieving the digital transition (EC 2020a, 14). The main instrument for the digital transition is Horizon Europe, particularly the European Innovation Council and public-private partnerships endorsed by the FP (EC 2020a, 14).

The third general objective (“An economy that works for the people”) puts R&I in the centre of the economy, with a specific goal of creating new jobs and economic growth (EC 2020a, 21). When it comes to the application of results to the economy, the proposed R&I component of the European Semester country specific recommendations (EC 2020a, 21) can be considered a form of soft law mentioned above. The fourth general objective (“A stronger Europe in the world”) encompasses the geopolitical component of the ERA, while the specific goal entails “broader association policy” for further integration of the R&I landscape (EC 2020a, 24). The fifth general objective (“Promoting our European way of life”) is connected to improving living conditions, especially preparedness for crises and preventing diseases (EC 2020a, 27), whereas the sixth (“A new push for European democracy”) involves social inclusiveness in the R&I area.

In accordance with the goal of creating a unique European research landscape and coordination of national R&I policies, the first priority area in the Policy Agenda entails actions which should contribute to deepening the internal market for knowledge (EC 2021c, 4).<sup>19</sup> Proposed actions encompass creating the European Open Science Cloud, supported

<sup>19</sup> The objectives of the new ERA are the following: 1. “prioritizing investments and reforms”, 2. “improving access to excellence”, 3. “translating R&I results into the economy”, and 4. “deepening the ERA” (EC 2020b, 5). In the Policy Agenda they are defined as “deepening a truly functioning internal market for knowledge”, “taking up the challenges posed by the twin green and digital transition”, “amplifying access to research and innovation excellence across the Union”, and “advancing concerted research and innovation investments and reforms” (EC 2021c, 2).

by the new EU legislative and regulatory framework for copyright and data (EC 2021c, 5). As stated in the Policy Agenda (EC 2021c, 5) this action is a continuation of “a long-term process of alignment and coordination pursued by the European Commission (EC) since 2015 with diverse stakeholders of the European research landscape.” In line with this, proposed actions also focus on the labour market in the R&I area, with special attention given to balanced mobility of researchers, their skills and work conditions, and prevention of gender inequality or other harmful practices (EC 2021c, 7-8). These policy actions are developed on the base of The European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers, but they also involve new initiatives on the EU level, such as ERA Talent Platform or ERA4You (EC 2021c, 7). In line with the Pact for R&I, actions are proposed for monitoring the level of academic freedom (EC 2021c, 9). Enhanced role of the EU is promoted in knowledge valorisation, with proposed standardization and management of intellectual property (EC 2021c, 10). The Policy Agenda also proposes updating of the European research infrastructure, with the European Research Infrastructure consortium as a focal point (EC 2021c, 11).<sup>20</sup>

The second priority area focuses on the digital and energy transition, and participation of the society in the ERA (EC 2021c, 13). The Policy Agenda proposes using two instruments – European partnerships and Horizon Europe’s missions – in coping with the challenges posed by the twin transition (EC 2021c, 13). With regard to the energy transition, proposed actions include a cooperation framework Strategic Energy Technology Plan which should be used for aligning the national energy and climate plans, and a pilot action for green hydrogen (EC 2021c, 14). Cooperation with the industrial sector where the R&I results could be applied in the context of green energy transition is also included in the Policy Agenda, as well as connecting with universities (EC 2021c, 16).

The third priority area is dedicated to excellence through further development of regional and national R&I ecosystems (EC 2021c, 18). That entails measures such as creating ERA Hubs and promoting science managers (EC 2021c, 18–19). Investments and reforms, set as the fourth priority area in the Policy Agenda, revolve mainly around the

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<sup>20</sup> The research infrastructure is further analyzed through the ESFRI Roadmap 2021, including both implemented (landmarks) and proposed (projects) research infrastructures (ESFRI 2021, 12). Serbia is an associated country within the ESFRI (242).

ERA implementation and monitoring, with respect to the national research systems' distinctions (ERA 2021c, 19–20).

## SERBIAN RESEARCH AND INNOVATION POLICY AND INTEGRATION INTO THE ERA

Following Leuffen et al.'s (2022, 85) analytical framework, both horizontal and vertical integration increase with “international interdependence, homogeneity of state preferences and capacities, [less] severity of compliance problems, low politics' policy characteristics”.<sup>21</sup>

The connections between academics and scientists greatly benefited from “the use of internet as a channel for scientific communication” (Heise and Pearce 2020, 1) in the last few decades, thus contributing to deeper international interdependence in R&I. Accordingly, Serbian researchers have been involved in collaboration projects with researchers from over thirty countries (EC 2022c), and record a significant number of co-authorships (Strategija naučnog i tehnološkog razvoja Republike Srbije [SNTR] 2021, 24). Additionally, R&I is considered the first policy area to be integrated into the EU, with FP6, FP7, and Horizon 2020 (SNTR 2021, 68).

When it comes to the policy area of R&I, preferences were clearly stated in the Negotiation position of the Republic of Serbia, where it's said that Serbia “accepts the *acquis* of the EU covered by the Chapter 25 Science and Research as it stands on 1 January 2016” (Government of the Republic of Serbia 2016, 2) with plans for further alignment (10). Along with the common interests and challenges Serbia faces as a part of Europe, the EU contributes to funding of the R&I system in Serbia (SNTR 2021, 66), which affects the interdependence and preferences. This is especially important in the context of the funding recipients (private for-profit entities, higher education establishments, SROs; R&I Country Profile 2023), which contribute to the overall domestic preference for integration.

There's low politicization in the issue area of R&I, so there aren't many obstacles regarding integration in this field.<sup>22</sup> In the introductory statement of the negotiating position, Serbia renounced specific adaptations

<sup>21</sup> This is a general framework based on the theory of intergovernmentalism (Leuffen et al. 2022, 84).

<sup>22</sup> External differentiation is expected in the “low politics” areas (Leuffen et al. 2022, 13).

and expressed no expectation of difficulty regarding the implementation of *acquis* within the Chapter 25 (Government of the Republic of Serbia 2016, 2).

Preferences of the EU regarding Serbian integration into the ERA were expressed in the Common position of the EU on the Chapter 25, which maintains that Serbia can “contribute to EU activities on research and innovation” (Ministry of European Integration [MEI] n. d., 1). The common position also expected no difficulty in negotiation of this chapter taking its nature into account, however, it announced that the EU would monitor “the alignment with and implementation of the *acquis*” (MEI n. d., 5). The EU preferences for Serbian integration into the new ERA can be related to the broader objective of creating an integrated European research landscape, as noted in several mentioned documents, and dealing with global challenges in a more coordinated manner. With respect to the capacities, annual progress reports of the EC for Serbia issued in the period 2016-2022 have evaluated this policy area as being “at good level of preparation” (EC 2016, 74; EC 2018, 77; EC 2019b, 83; EC 2020c, 101; EC 2021b, 103; EC 2022b, 111), but they also conveyed certain remarks and recommendations for further improvement.<sup>23</sup>

Since closing this chapter, Serbia has continued to implement priorities and guidelines of the ERA, to participate in the EU FPs, and carry out legislative, institutional, and other policy reforms, therefore not showing many problems with compliance. European Commission highlighted the following achievements of Serbia in the process of integration into ERA: “adoption of National Roadmap for Research Infrastructure (2018), Participation in four European Research Infrastructure Consortia (ERIC), Adoption of Serbian Smart Specialization Strategy (4S) (2020-2027) and Open Access policy, Publication of Research for Innovation Strategy 2016-2020” (EC 2022c). It also commended Serbian participation in or collaboration with several associations, strategies, and programmes which address R&I on European or regional level.<sup>24</sup>

<sup>23</sup> For instance, the R&I strategy from 2016 to 2020 lacked an Action plan (EC 2016, 74), so the Action plan was adopted in 2018 (EC 2019b, 83), and the subsequent strategy came with an incorporated action plan.

<sup>24</sup> Programmes: COST, EUREKA, Science and Peace for Security, Central European Exchange Programme for University Studies; Strategies: Western Balkan Regional R&D Strategy for Innovation, EU Strategy for the Danube region; Associations: South East European International Institute for Sustainable Technologies, European Institute of Innovation and Technology’s (EIT) Knowledge and Innovation Communities, European Universities Association (EC 2022c).

Organizations from Serbia were also active within Horizon 2020, with around four thousand project proposals, although their success rate was relatively low (12.5%) (R&I Country profile 2023). Nevertheless, approved projects received funding of around 135 million euros, out of which 36% was allocated to the research organizations (R&I Country profile 2023). As of January 2023, Serbia also became an associated country of Horizon Europe.<sup>25</sup>

The Serbian legislative framework in the R&I area has changed since the chapter was preliminary closed to include two new laws – the Law on Science and Research and the Law on the Science Fund of the Republic of Serbia – as well as several strategies<sup>26</sup> aiming at different aspects of the R&I system.<sup>27</sup> Accordingly, the institutional structure of the national R&I system has changed to include new institutions and reform some of the existing practices. First, funding of the scientific research organizations (SROs) has been institutional since 2019 (SNTR 2021, 27). Secondly, two new organizations were established – the Science Fund and the Innovation Activity Fund (27). Four science-technology parks (in Belgrade, Novi Sad, Niš, and Čačak) and the Centre for Promotion of Science (28) were added to the institutional framework. Furthermore, a new Ministry of Science, Technological Development and Innovation was created in 2022 (Ministarstvo nauke, tehnološkog razvoja i inovacija n. d.).

Besides the institutional and legal reforms, the current state of research and innovation in Serbia has been improving in the last decade, however, there's space for further development, especially in the areas of funding, human resources, and excellence. Even though Serbia has increased allocated funds to R&I from 2009 to 2019, they are still below

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<sup>25</sup> The Agreement between the EU and Serbia was signed on March 23, 2022 (OJ EU L 95/63), and it was confirmed in January 2023 (Government of the Republic of Serbia 2023).

<sup>26</sup> Most importantly, the Smart Specialization Strategy and Strategy for Artificial Intelligence Development (SNTR 2021, 18).

<sup>27</sup> At the moment of negotiation of the Chapter 25, Serbian legislative framework in this area was based on the 2015 Law on Scientific and Research Activity and 2013 Law on Innovation Activity (Government of the Republic of Serbia 2016, 2). Strategic documents in this area consisted of the Strategy of Scientific and Technological Development of the Republic of Serbia 2010-2015 and of Action Plan for implementation (2). Institutional structure rested upon the Ministry of Education, Science and Technological Development, and the Serbian Academy of Sciences and Arts and Matica Srpska (3).

the EU average (SNTR 2021, 33). This is especially the case when it comes to investments from the economy to R&I (35), but it's also salient for other sources of funding. Budget of the Republic of Serbia for R&I in 2021 was around RSD 62 billion, allocated to the business (non-financial) sector (45%), the higher education<sup>28</sup> (28%) and the government sector (27%) (Republički zavod za statistiku [RZS] 2022b). The number of researchers in 2021 was 16962, which was 71% of the overall number of people employed in R&I in Serbia (RZS 2022b). However, the number of researchers per mill in Serbia is still twice smaller than in the EU,<sup>29</sup> and their sectoral assortment suggests concentration in the higher education area and the state sector (RZS 2022b), while their participation in the economy remains low (SNTR 2021, 39-40).<sup>30</sup> On the other hand, there's favourable gender distribution (51.4% of women researchers and 34% of women in top positions)<sup>31</sup> and the advantage of relatively young researchers (SNTR 2021, 41-42).

The overall number of scientific outputs in 2021 was 13151, comprising of basic (7408), applied (3365) and experimental research (2378), with the higher education sector (including SROs) as primary contributor, followed by the government and the business sector (RZS 2022c, 398). This shows there's space for improvement, especially in sectors other than higher education. In addition to this, the Strategy of scientific and technological development of the Republic of Serbia 2021-2025. "The Power of Knowledge" (The PoK Strategy hereinafter) adopted by the Serbian Government in February 2021 (Vlada Republike Srbije 2021) includes several measures for the research and innovation policy reform.

### **The "Power of Knowledge" Strategy 2021-2025.**

This section of the paper is dedicated to the Serbian strategy on R&I, with special focus on the main priorities and policy actions, as well as their position vis-à-vis the main themes in the above-mentioned EU documents.

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<sup>28</sup> Also including SROs.

<sup>29</sup> Additionally, the percentage of people with PhD in the Serbian population with higher education was only 2% in 2021 (RZS 2022a).

<sup>30</sup> Scientific research organizations are predominantly geographically situated in the region of Belgrade (63%) (RZS 2022b).

<sup>31</sup> An interesting discussion on the position of women in Serbian science can be found in (Todorović Lazić 2023).

Preferences for integration into the ERA remain salient in the PoK Strategy, which states that “The Republic of Serbia, as a candidate country for the EU membership, follows the legal *acquis* of the EU, and carries out necessary reforms and activities in this area in order to join the European Research Area” (SNTR 2021, 14). Besides, its structure, main policy goals and methods of their achievement are in compliance with the ERA guidelines which were in effect at the time.<sup>32</sup>

The general goal of the PoK Strategy is for “the science-technology and innovation system to contribute to the accelerated development of the Republic of Serbia through advancement of quality and efficacy of science, technological development and innovations, and to further integration into the European Research Area, thus helping the achievement of developed economies standards” (SNTR Srbije 2021, 51). In comparison to the new Strategic plan 2020-2024, however, this document primarily focuses on R&I application in the economy, although it also contains measures directed at the digital transition, while the environmental goals are present but less elaborated.

Both Strategic plan 2020-2024 and the EU reports on Serbia recommended increasing budgetary expenditures for R&I, and better connections between science and the economy (EC 2019b, 83; EC 2020a, 15). In line with these recommendations, the PoK Strategy suggests increasing domestic expenditures for R&I, especially matching the investments from the economy with the budgetary funds (SNTR 2021, 55). Besides funding, the first specific goal of the PoK Strategy (“Providing necessary conditions for the dynamic development of science, technology development and innovation”) also addresses researchers and research infrastructure (54). Measures for increasing the number of researchers include programmes and stipends for young researchers and programmes for repatriates, but they also encompass attracting foreign researchers, researchers from Serbian diaspora, and from the region to participate in research activities in Serbia (SNTR 2021, 55). This is compatible with the Policy Agenda’s goal of balanced mobility (EC 2021c, 7–8), considering that it would simultaneously limit the “brain drain” from Serbia, and attract researchers to be involved in R&I in Serbia. The last section

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<sup>32</sup> They include: 1. A more efficient national research system; 2. An integrated approach in coping with social challenges, optimal financing and using a big research infrastructure in accordance with ESFRI; 3. Transparency and an open market for researchers; 4. Gender equality; 5. Open-access science and knowledge transfer; 6. International cooperation (SNTR 2021, 14-15).

of this goal entails investing into research infrastructure, including digitalization (SNTR 2021, 55–56). Not only is this measure compatible with the goal of digital transition of the Strategic Plan (EC 2020a, 14), but the new R&I platform of eScience (eNauka) also contributes to the open access policy<sup>33</sup> and better management of scientific results (SNTR 2021, 57), thus providing a base for Serbian integration into the planned European Open Science Cloud (EC 2021c, 4).

The second specific goal (Increasing efficacy of usage of scientific research system's results) is focused on the efficacy of the national research system, through measures of monitoring the realization of research activities, structural reforms of pilot SROs, social application of scientific knowledge and contribution to public policy and cultural development (SNTR 2021, 58–61). The first two measures are directed at strengthening the institutional framework and they are compatible with the Policy Agenda's measure of reforming the assessment system for research and researchers (EC 2021c, 6). The remaining measures under this specific goal regarding the application of scientific results,<sup>34</sup> can relate to the Policy Agenda's second priority area (EC 2021c, 14-15), and especially the Strategic Plan 2020-2024 in general. Both documents are directed at broader population's participation (EC 2021c, 17), albeit the Strategic Plan 2020-2024 to a greater extent (EC 2020a, 31).

The third specific goal (Nurturing top-quality science and technological development and increasing the economy's competitiveness) is directed at the quality of science in Serbia, namely at the support for researchers whose papers were published in journals with high impact factor and highly cited researchers, as well as facilitating access to literature and journals (SNTR 2021, 62–63). In other words, these measures should promote excellence, which is both a value under the EU Pact for R&I (EC 2022a) and a priority area of the Policy Agenda (EC 2021c, 18–19). This goal also incorporates plans on improving the usage of scientific results in the economy, with special focus on strengthening the so-called “innovation-based economy” (SNTR 2021, 64). This

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<sup>33</sup> The “standards of open science, open access and protection of intellectual property” are an explicit part of the second specific goal of the PoK Strategy (SNTR 2021, 60).

<sup>34</sup> The PoK Strategy gives special attention to social sciences and humanities (SNTR 2021, 60), whereas the Strategic Plan 2020-2024 only mentions them (EC 2020a, 31), and they're not included in the Policy Agenda.



is convergent with the EC's position on knowledge, and the central role of R&I for the economy.

The fourth specific goal (Focusing research on social challenges and priorities) of the PoK Strategy involves coping with social challenges, such as public health, food and water safety, environment protection, and priority technologies, i.e., artificial intelligence, informational technology etc. (SNTR 2021, 66). The PoK Strategy, which was issued in the specific context of the COVID-19 pandemic, doesn't specifically mention the global energy crisis. Although it's indirectly included through this measure, this is the part of the PoK Strategy which can be expanded in greater detail. Furthermore, EC annual reports for 2021 and 2022 call for better integration into the new European Research Area (EC 2021b, 103; EC 2022b, 111). Therefore, this area of R&I policy can be of use not only in the process of ERA integration as a goal for itself, but also for tackling the current energy crisis unfolding in Europe, which affects Serbia, as well.

Finally, the last specific goal of the PoK Strategy is enhancing international cooperation, where the role of the EU could be the most prominent as the new ERA entails a significant international dimension. The goal of strengthening international cooperation is mainly directed at the EU, and it entails further participation in the EU programmes, especially Horizon Europe, as well as programmes involving EU such as EU-REKA, and COST (SNTR 2021, 68–69). This converges with the EC's emphasis on Horizon Europe for the new ERA, although there's space for growth in the area of partnerships under this FP (EC 2021c, 13; EC 2020a, 11). The second part of this goal involves bilateral and regional cooperation, as well as for Serbia to extend presence in various research infrastructures in Europe (SNTR 2021, 69–70). This provides a base for Serbian involvement in the proposed regional institutional arrangements such as ERA Hubs (EC 2021c, 18), as well as proposed research infrastructure projects under the ESFRI (ESFRI 2021).

## CONCLUSION

The first part of the paper was dedicated to the policy area of R&I, especially its external dimension, which can be considered a form of power, foreign policy instrument, or as part of science diplomacy. In this paper we tried to put the external aspect of the EU R&I policy in the context of the European integration process, with special focus on

Serbia as a candidate country for the EU membership, an ERA country, and an associated country of Horizon Europe. Based on the conception of the EU as a system of differentiated integration, this paper presents the main developments in the R&I area, which cumulatively indicate that the reformed ERA has been advancing towards a policy regime, although with certain flexibility. This inference is based on the common priorities and agenda, rules of conduct, standards, and institutional bodies connecting not only the EU Member States, but associated countries, and other pertinent actors across Europe, especially in the context of the ERA reform. This paper specifically focused on two EU documents, the EC Strategic Plan and the ERA Policy Agenda, that convey and adopt the guidelines of the reformed ERA.

The second part of the paper addressed the Serbian position in the forming European research landscape. It presented the main points in the negotiation process, and reforms Serbia has implemented after closing Chapter 25 with respect to the ERA priorities and guidelines. Further integration into ERA is based on the continuous preferences of both the Government and other actors which benefit from the integration, as well as the fact that this policy area pertains to “low politics”. Consequently, Serbia has been compliant with the EU recommendations in this policy area. With regard to this, we analysed the Serbian “Power of Knowledge” Strategy, which showed a great level of convergence with the aforementioned EU documents, even though there are certain areas which demand further attention.

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**Олга Стевановић\***

*Институт за политичке студије*

**ПОЛИТИКА ИСТРАЖИВАЊА И ИНОВАЦИЈА  
У ЕВРОПСКОЈ УНИЈИ И ИНТЕГРАЦИЈА  
РЕПУБЛИКЕ СРБИЈЕ У РЕФОРМИСАНИ  
ЕВРОПСКИ ИСТРАЖИВАЧКИ ПРОСТОР**

**Резиме**

У овом раду се разматра политика истраживања и иновација у Европској Унији у контексту реформе Европског истраживачког простора, са посебним освртом на његову спољну димензију. Први циљ овог рада је да опише главне промене у истраживању и развоју до којих је дошло у претходној деценији, са нагласком на њихов значај за процес европских интеграција. Полазећи од концепта екстерне диференцијације Лојфена и др., у овом раду се ЕИП посматра као режим управљања који се простира ван граница Европске Уније. У складу са тиме, други циљ овог рада је представљање српске политике истраживања и иновација у контексту интеграције у ЕИП након затварања поглавља о науци и истраживањима. Кроз тематску анализу стратегија у области истраживања и иновација, овај рад ће утврдити да ли је српска политика у овој области подударна приоритетима и упутствима новог ЕИП, чинећи је на тај начин делом ширег европског истраживачког поља.

**Кључне речи:** ЕУ, Европски истраживачки простор, истраживање и иновације, Србија

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\* Имејл-адреса: [olga.stevanovic@ips.ac.rs](mailto:olga.stevanovic@ips.ac.rs).

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