European Commission

ERA Country Report 2024
Serbia

Independent
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Report

Research and Innovation

ERA Country Report 2024: Serbia

European Commission
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EUROPEAN COMMISSION

ERA Country Report 2024

Serbia

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2025 Directorate-General for Research and Innovation EN

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Key takeaways

- Despite having not formally committed to any ERA Action, Serbia is aligning its R&I framework with ERA priorities, making progress in open science, increasing open-access publications, and improving gender equality in research.
- Serbia actively participates in 14 EU partnerships and projects like Processes4Planet and the European Rare Diseases Research Alliance, showcasing its commitment to fostering innovation, sustainability, and international collaboration.
- While progress is evident in several actions, challenges remain in translating research outputs into economic benefits and retaining talent, highlighting the need for sustained investment and reforms.

1. National context

Serbia is among the medium-sized associated countries and categories as an *Emerging Innovator* in the latest 2024 European Innovation Scoreboard. Its Vojvodina region is also categorised as an emerging innovation region on the latest 2024 Regional Innovation Scoreboard. Serbia‘s share of female researchers remains equal with 51 percent.

As an Associated Country Serbia’s R&I policies are evolving to align more closely with European Research Area (ERA) priorities without having made specific commitments to ERA Policy Agenda actions. Key national strategies, such as the Smart Specialisation Strategy (S3) for 2020-2027 and the Strategy for Scientific and Technological Development 2021-2025 ("The Power of Knowledge"), provide a comprehensive framework for fostering innovation and research excellence. The S3 strategy emphasises areas like digitalisation, biotechnology, and eco-smart solutions, aiming to integrate Serbia into global and European research ecosystems. The action plans under these strategies operationalise objectives such as fostering interdisciplinary research and enhancing knowledge valorisation through targeted investments.

The restructuring of governance through the establishment of the Ministry of Science, Technological Development, and Innovation (NITRA) highlights a strategic realignment to prioritise science and innovation. Policies such as the Law on Innovation Activity and tax incentives for intellectual property investments aim to create a supportive environment for research and enterprise.

Table 1 Structural Key Indicators

Indicator	EU27	Serbia		
	2023	2023	Average 2018-2020	Average 2021-2023
GDP in current prices, per capita	35,790.00	9,070.00	6,116.67	7,890.00
Gross Domestic Expenditure on R&D (GERD) as a share of GDP	2.27	0.97	0.91	0.98
Size of the population (million)	448.80	6.64	6.96	6.77
Researchers (in FTE) per million inhabitants	4,681.34	2,349.68	2,104.37	2,302.05

Source: Annex 1

Despite progress in areas like gender equality and international collaboration, challenges remain, including low R&D investment levels, limited private sector involvement, alongside difficulties in retaining skilled researchers due to limited domestic opportunities and resources. Addressing these barriers will be critical for Serbia to fully leverage its integration into ERA and achieve sustainable development goals.

2. Status of the Implementation of the ERA Policy Agenda

Chapter 2 briefly summarises **new developments in Serbia since the publication of the ERA Country Report 2023**. Despite Serbia has not indicated commitments to actions identified in the ERA Policy Agenda 2022-2024, this chapter briefly presents developments in

Serbia towards the overarching ERA Priorities. The findings are based on qualitative desk research and interviews.

ERA Priority 1: Deepening a truly functioning internal market for knowledge

In 2024, Serbia made strides in advancing Open Science (OS) in relation to **ERA Action 1**. Held on November 5, 2024, at the University of Belgrade, the fifth edition of Open Science Day brought together researchers, librarians, and policymakers to discuss Serbia's progress in adopting OS principles. Notably, this edition was organised by the research community without a dedicated budget or major project support, indicating a growing grassroots commitment to OS practices in Serbia.[1] At the Open Science Day event, the new draft of Serbia's national open science policy was presented. Building on the 2018 Open Science Platform, which mandated open access to publications and recommended data sharing, the new policy expands the scope. It proposes mandatory Data Management Plans (DMPs) for publicly funded research, use of digital identifiers, adoption of open-source practices, transparent access to research infrastructure, and open science training.[2] A Serbian consortium received seed funding through the TIER2 2024 open call to foster research practices and promote Open Science by creating a new Reproducibility Network. This initiative is expected to enhance the reliability and transparency of scientific research in Serbia.[3] While not exclusive to Serbia, the launch of the EOSC EU Node in October 2024 represents a significant milestone in the development of a federated infrastructure for open sharing and re-use of research data across Europe. Serbian research institutions are anticipated to benefit from and contribute to this integrated digital research ecosystem.[4]

In 2024, Serbia continued to develop its legal framework concerning copyright and data protection, aligning with European standards to support research and innovation (**ERA Action 2**). Serbia's digital copyright framework, governed by the Law on Copyright and Related Rights, aligns with international standards in the Berne Convention. However, enforcement mechanisms need strengthening, public awareness of digital copyright laws remains low, and the framework must continuously adapt to address challenges posed by emerging technologies. Improving these areas is crucial to fully safeguard digital content and foster innovation in the digital landscape.[5] The Law on Personal Data Protection (LPDP), modelled after the EU General Data Protection Regulation (GDPR), continues to govern data protection matters in Serbia. This law applies to the processing of personal data carried out by controllers or processors with a registered office, residence, or domicile in Serbia, ensuring that data privacy regulations bind various entities, including public and private organisations.[6] Notable development in the legal framework concerning copyright and data protection in Serbia was adoption of tax incentives for intellectual property. In August 2024, the Serbian government introduced a new Rulebook on Exemption from Capital Gains Tax on the Transfer of

[1] EIFL. "Open Science Day V: Highlights from Serbia." EIFL.net. https://www.eifl.net/blogs/open-science-day-v-serbia.
[2] Ibid.
[3] EurekAlert. "Serbia Launches New Reproducibility Network to Foster Open Science." EurekAlert.org. https://www.eurekalert.org/news-releases/1057420.
[4] European Open Science Cloud. "European Commission Announces EOSC EU Nodes Transition to Full Production." https://open-science-cloud.ec.europa.eu/news/european-commission-announces-eosc-eu-nodes-transition-full-production.
[5] Generis Online. "Understanding Digital Copyright Standards in Serbia: Protections, Licensing, and Enforcement." https://generisonline.com/understanding-digital-copyright-standards-in-serbia-protections-licensing-and-enforcement.
[6] CEE Legal Matters. "Serbia Data Protection 2024." https://ceelegalmatters.com/data-protection-2024/serbia-data-protection-2024.

Copyright and Related Rights and Industrial Property Rights. This rulebook provides tax exemptions for individuals who invest intellectual property into resident legal entities, aiming to develop the creative economy and encourage the creation of intellectual property within Serbia.[7]

During Open Science Day V, the OSTrails project and its forthcoming Serbian national pilot were introduced (**ERA Action 3**). OSTrails aims to advance processes and instruments for planning, tracking, and assessing scientific knowledge production, enhancing existing infrastructure, and connecting key components. The full pilot results are anticipated to be presented at the next Open Science Days in 2026.[8]

In relation to **ERA Action 4,** the Regional Youth Leadership Mobility Program (RYLMP) 2023-2024 empowered 19 young researchers from Albania, North Macedonia, and Serbia by enhancing their research, leadership, advocacy, and public engagement skills on key youth-related issues while forming lasting connections across the region.[9] The Astronomical Observatory of Belgrade announced a public call for co-financing the mobility of researchers from Serbia and Italy for the period 2024 to 2026. This initiative aims to foster scientific collaboration and exchange between the two countries.[10]

Throughout 2024, Serbian research organisations continued to develop and implement Gender Equality Plans (GEPs) to comply with Horizon Europe requirements (**ERA Action 5**). Institutions such as the University of Novi Sad, the Institute Mihajlo Pupin, and the Mathematical Institute of the Serbian Academy of Sciences have been actively working on GEPs to promote gender equality in research and innovation.[11] In October 2024, Serbia hosted two satellite events under the regional Women's Entrepreneurship EXPO 2024 initiative. These events brought together over 180 participants, providing a platform for women entrepreneurs to connect, showcase their businesses, and explore potential collaborations with some of the country's most influential companies. The initiative aimed to empower women entrepreneurs and promote their role in driving economic growth in Serbia.[12]

In 2024, Serbia faced challenges related to academic freedom and foreign interference in research and innovation (**ERA Action 6**). The Freedom House Report from March 2024 highlighted a decline in civil rights and freedoms in Serbia, marking the sharpest decrease in Europe. The report noted that while academic freedom has largely been upheld, recent practice and legal changes have raised concerns about political influence.[13] In November 2024, over 1 000 university students in Belgrade protested outside the chief prosecutor's office,

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[7] Lexology. "Serbia: New Rulebook on Exemption from Capital Gains Tax on Intellectual Property." https://www.lexology.com/library/detail.aspx?g=483a52f1-9a81-444b-9e01-7cb987d08037.

[8] OSTrails. "OSTrails in Serbia: Showcasing the Future of Open Science with National Pilot." https://ostrails.eu/ostrails-in-serbia-showcasing-the-future-of-open-science-with-national-pilot.

[9] SciDev Center. "Regional Youth Leadership Mobility Program 2023-2024 Concluded with a Final Event in Tirana." https://scidevcenter.org/2024/10/29/regional-youth-leadership-mobility-program-2023-2024-concluded-with-a-final-event-in-tirana.

[10] Astronomical Observatory of Belgrade. "Public Call for Co-Financing of the Mobility of Researchers from Serbia and Italy from 2024 to 2026." https://www.aob.rs/en/news-en/calls/275-public-call-for-co-financing-of-the-mobility-of-researchers-from-serbia-and-italy-from-2024-to-2026.

[11] Western Balkans Info Hub. "Gender Equality Plans in Serbia." https://www.westernbalkans-info-hub.eu/news/gender-equality-plans-in-serbia.

[12] UN Women ECA. "EXPO 2024: Women Entrepreneurs Continue to Lead and Drive Economic Growth in Serbia." https://eca.unwomen.org/en/stories/feature-story/2024/11/expo-2024-women-entrepreneurs-continue-to-lead-and-drive-economic-growth-in-serbia.

[13] Freedom House. "Decline in Civil Rights and Freedoms in Serbia." Freedom House Report 2024. https://freedomhouse.org/country/serbia/freedom-world/2024.

demanding justice for the collapse of a concrete canopy in Novi Sad that resulted in 15 deaths, reflecting broader concerns about institutional integrity in Serbia.[14]

According to the latest Global Innovation Index for 2024, Serbia is ranked 52nd out of 133 countries, advancing one place compared to 2023. This improvement reflects Serbia's ongoing efforts to enhance its innovation ecosystem and knowledge valorisation capabilities (**ERA Action 7**).[15] In 2024, the BIO4 initiative secured significant funding and finalised architectural plans for the construction of research and innovation hubs. Future plans include the completion of the BIO4 research complex by 2026, enhanced collaboration with European research infrastructures, and targeted programs to foster interdisciplinary research in biotechnology and life sciences.[16]

In 2024, Serbia also undertook several initiatives to strengthen its research infrastructures (**ERA Action 8)**. Serbia engaged in the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap 2026 update process, underscoring Serbia's commitment to integrating its national research infrastructures within the broader European landscape and the alignment with European standards and facilitating broader access to research facilities.[17] On November 25, 2024, the Ministry of Science, Technological Development, and Innovation of Serbia hosted the second EU-Serbia Joint Research and Innovation Committee meeting. Key achievements highlighted during the discussions included Serbia's increasing participation in Horizon Europe, with a record number of funded projects in 2024, and advancements in the integration of Serbian researchers within European consortia. The BIO4 biotechnology campus project and the SAIGE initiative exemplify Serbia's focus on bolstering infrastructure and linking research with innovation-driven entrepreneurship, indicating a policy shift towards sustainable growth and economic transformation.

ERA Priority 2: Taking up together the green transition and digital transformation and other challenges with impact on society and increasing society's participation in the ERA

Related to **ERA Action 10,** in July 2024, Serbia and the European Union signed a Memorandum of Understanding to strengthen collaborations in sustainable raw materials, battery production chains, and electric vehicles (EVs). This partnership facilitates Serbia's integration into European industrial value chains, promoting the green transition and aligning with EU missions focused on climate neutrality and smart cities.[18] As of 2024, Serbia is involved in 14 partnerships under the ERA framework but does not currently coordinate any partnerships. This level of engagement demonstrates Serbia's active participation as a contributing partner rather than as a lead entity. Serbian organisations have participated in 15 joint calls, resulting in 24 funded projects. These projects underline the country's growing capacity to engage in collaborative research and innovation activities. Nine Serbian organisations are registered in the ERA database, showcasing a range of contributions across various sectors, including

[14] Associated Press. "Striking Students in Serbia Tell Chief Prosecutor to 'Fight for Law and Justice'." https://apnews.com/article/b2aa7a208e53006dab4e086588b7355d.
[15] Intellectual Property Office of the Republic of Serbia. "Global Innovation Index 2024: Serbia Ranked 52nd." https://www.zis.gov.rs/en/vesti/2024-gii-issued.
[16] European Commission. "2nd EU-Serbia Joint Research and Innovation Committee Meeting." https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/2nd-eu-serbia-joint-research-and-innovation-committee-meeting-2024-11-29_en.
[17] ESFRI. "Roadmap 2026." European Strategy Forum on Research Infrastructures (ESFRI). https://www.esfri.eu/roadmap-2026.
[18] Reuters. "Serbia, EU Agree Closer Ties on Sustainable Raw Materials, Battery Production, EVs." https://www.reuters.com/sustainability/serbia-eu-agree-closer-ties-sustainable-raw-materials-battery-production-evs-2024-07-19.

geology, agriculture, education, and public administration. The Serbian Ministry of Education, Science and Technological Development participates in seven networks and two joint calls. It plays a pivotal role in driving education and scientific innovation through ERA partnerships.[19] Serbian institutions take part in the European Rare Diseases Research Alliance (ERDERA), which aims to strengthen international collaboration in areas such as multinational clinical studies and advanced therapeutic medicinal products through the establishment of a European Clinical Research Network and Acceleration Hub. Additionally, Serbia participates in the EuroHPC Joint Undertaking, leveraging high-performance computing (HPC) for applications that address global challenges. Serbian institutions are also part of the Photonics Partnership, contributing to a thriving EU photonics ecosystem comprising over 5,000 SMEs and large companies. This partnership focuses on identifying future R&I priorities and publishing Horizon Europe call topics for 2023 and 2024. Furthermore, Serbia engages in Processes4Planet (P4Planet), which works towards technological sovereignty and sustainability through innovations in plastics circularity and recycling, promoting efficient resource use and environmental stewardship.[20]

Related to **ERA Action 11**, Serbia's Ministry of Environmental Protection released a Draft Environmental Protection Strategy (2024-2033) in September 2024 outlining the national environmental policy for the next decade. Aligned with the Green Agenda principles, the strategy emphasises: climate change and decarbonisation, circular economy, addressing air, water, and soil pollution to enhance public health, biodiversity and ecosystem protection, and sustainable food systems and rural development. The strategy was open for public consultation in October 2024.[21]

Throughout 2024, the United Nations Development Programme (UNDP), together with EU support, continued the "EU for Green Agenda in Serbia" initiative. The initiative selected 23 innovative projects for implementation in 2024 in areas such as wetland habitat preservation, green transition of the economy, and air quality improvement.[22] These calls provide co-financing and technical assistance to selected projects. The initiative supports for civil society organisations by funding projects aimed at enhancing natural values in protected areas, contributing to biodiversity conservation and climate resilience (**ERA Action 12**). The initiative also aims to assists municipalities in developing and implementing air quality plans and energy efficiency measures.[23] The European Bank for Reconstruction and Development (EBRD) achieved a record investment of EUR 846 million in Serbia in 2023, marking a significant increase from previous years. In September 2024, EIT Manufacturing launched its first national-level programme in Serbia, implemented in collaboration with the Serbian Association of Regional Development Agencies (SARRA) and REDASP Sumadija and Pomoravlje. This initiative is designed to mobilise and interlink manufacturing stakeholders across Serbia, fostering cooperation between national and regional actors and EIT Manufacturing to create inclusive, digital, and green manufacturing ecosystems. One of the standout features of this programme is its strong emphasis on inclusion, with a clear focus on fast-tracking the

[19] ERA LEARN, https://www.era-learn.eu
[20] European Commission (2024). Performance of European Partnerships: Biennial Monitoring Report 2024 on Partnerships in Horizon Europe. Directorate-General for Research and Innovation. Luxembourg. DOI: 10.2777/991766.
[21] Balkan Green Energy News. "Serbia Publishes Draft Environmental Protection Strategy for 2024–2033." https://balkangreenenergynews.com/serbia-publishes-draft-environmental-protection-strategy-green-agenda-2024-2033/.
[22] EU for Green Agenda in Serbia. "Open Calls." https://zelena-agenda.euzatebe.rs/en/open-calls.
[23] EU Delegation to Serbia. "Serbia Goes Green: About the Green Future of Serbia." https://europa.rs/serbia-goes-green-about-the-green-future-of-serbia/?lang=en.

transition of Serbian manufacturing ecosystems to better account for diversity, youth engagement, and gender equality.[24]

The Serbian government has been implementing the "Strategy for Development of Education in Serbia by 2030," accompanied by action plans that emphasise the integration of digital technologies and sustainable practices within HEIs (**ERA Action 13**). This strategic approach aims to enhance the quality of education and research, fostering an environment conducive to innovation and interdisciplinary collaboration.[25] Serbia has also been implementing the "Program for the Development of a Circular Economy (2022-2024)," recognizing the pivotal role of HEIs in promoting sustainable resource utilisation and innovation. This programme encourages universities to incorporate circular economy principles into their curricula and research agendas, aligning with the broader goals of the green transition.[26] In November 2024, Belgrade hosted the "Sustainable Development Forum 2024," themed "The Green Transition – Economy, Energy & Health." Organised in partnership with the University of Cambridge and the Serbian Chamber of Commerce, the conference brought together global leaders, experts, and academics to discuss pressing environmental challenges and the role of HEIs in addressing them.[27] The Science Fund of Serbia has expanded its funding mechanisms, increasing the number of supported programmes from 8 to 11 and the budget from EUR 74.5 million to EUR 107.5 million. This enhancement facilitates greater opportunities for HEIs to engage in innovative research, particularly in areas pertinent to the green and digital transitions.[28]

Finally, related to **ERA Action 14**, the Centre for the Promotion of Science, under the auspices of the Ministry of Science, Technological Development, and Innovation of Serbia, announced a second public call for funding citizen science research projects from September 10 to October 10, 2024. This initiative aims to strengthen collaboration between researchers and citizens, addressing societal challenges and promoting innovative research approaches.[29] In 2024 a project led by the nature conservation NGO 'Frame of Life' around a river protected area in western Serbia involved citizens in creating a comprehensive biodiversity database. This effort aimed to expand the existing protected area fivefold, preventing the construction of a dam and preserving local ecosystems.[30]

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[24] EIT Manufacturing (2024). EIT Manufacturing launches national-level programme in Serbia. https://www.eitmanufacturing.eu/news-events/news/eit-manufacturing-launches-national-level-programme-in-serbia/

[25] Eurydice - European Commission: "Strategy for Development of Education in Serbia by 2030." https://eurydice.eacea.ec.europa.eu/national-education-systems/serbia/legislation-and-official-policy-documents

[26] Regional Center for Circular Economy (RCEL): "Program for the Development of a Circular Economy in the Republic of Serbia (2022-2024)." https://rcel.rs/en/program-for-the-development-of-a-circular-economy-in-the-republic-of-serbia-between-2022-2024-the-green-transition-challenge/

[27] Sustainable Development Forum: "The Green Transition – Economy, Energy & Health." https://sustainable-devforum.org

[28] Western Balkans Info Hub: "2024 Enlargement Package: Key Findings on Serbia Related to the Knowledge Economy." https://www.westernbalkans-infohub.eu/documents/2024-enlargement-package-key-findings-on-serbia-related-to-the-knowledge-economy

[29] Western Balkans Info Hub. "Serbia Announces 2nd Public Call for Citizen Science Research Projects." https://www.westernbalkans-infohub.eu/calls/serbia-2nd-public-call-for-citizen-science/.

[30] European Rangers. "Citizen Science in Serbia: 6 New Species Worldwide and 29 Hearts for Nature." https://www.europeanrangers.org/citizen-science-in-serbia-6-new-species-worldwide-and-29-hearts-for-nature.

ERA Priority 3: Enhancing access to research and innovation excellence across the Union and enhancing interconnections between innovation ecosystems across the Union

Serbia's Smart Specialisation Strategy (S3) 2020-2027 framework is directly rooted in its participation in the ERA, focusing on enhancing R&I performance through targeted investments and reforms. The implementation of S3 has been operationalised through the new Action Plan for 2023-2025, adopted in December 2023. Strategy for Scientific and Technological Development 2021-2025 ("Power of Knowledge") represents Serbia's national roadmap for integration into the ERA, emphasising the importance of R&I in national development (**ERA Action 16**). In September 2024, the World Bank approved an additional EUR 25 million in financing for the Serbia Accelerating Innovation and Growth Entrepreneurship (SAIGE) Project. This funding aims to strengthen links between scientists and innovators, support artificial intelligence (AI) solutions and biotechnology, and mobilise private capital. The resources are directed to Serbia's Science Fund and Innovation Fund, key institutions that play a transformative role in building and consolidating the science and innovation ecosystem in Serbia.[31]

University of Kragujevac from Serbia joined the EURAXESS Startup Hub with a group of other institutions from the Western Balkans in July 2024. This expansion is part of the ERA TALENT project with the objective to support the career development of researchers in Europe, opening up new career paths in academia, industry, business, the public, and non-governmental sectors (**ERA Action 17**).[32]

ERA Priority 4: Advancing concerted research and innovation investments and reforms

Serbia has made notable progress in aligning its research and innovation (R&I) policies with ERA priorities. In October 2022, Serbia restructured its R&I governance by establishing the Ministry of Science, Technological Development, and Innovation (NITRA). NITRA is responsible for developing the country's R&I system and policies, coordinating reforms under the Serbia Accelerating Innovation and Growth Entrepreneurship (SAIGE) project.

3. Contribution of ERA Actions to national performance in reaching ERA objectives

This chapter provides a qualitative assessment of how the joint ERA Actions contributed to Serbia's performance in achieving the ERA objectives as defined in the Pact for R&I during the period 2022-2024.

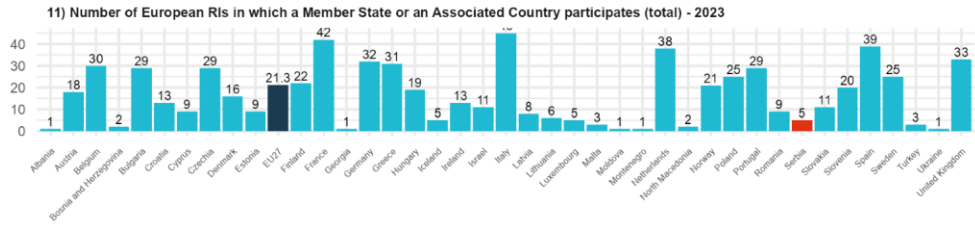
ERA Priority 1 is addressed through a range of initiatives focussing on **ERA Actions 1 to 9** which aim to create structural reforms and other interventions. Although Serbia has not committed to ERA, the country is designing its policies and aligning infrastructure to integrate into

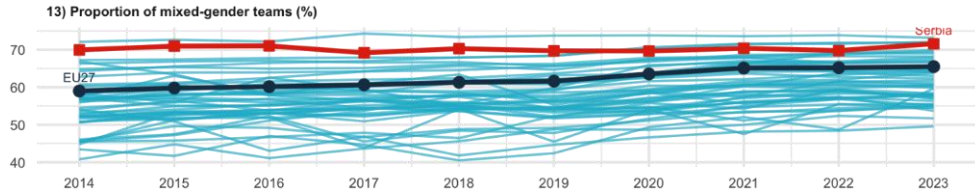
[31] World Bank. "Serbia to Enhance Competitiveness by Boosting Science-Innovation Links, Artificial Intelligence, and Biotech with World Bank Support." https://www.worldbank.org/en/news/press-release/2024/09/26/serbia-to-enhance-competitiveness-by-boosting-science-innovation-links-artificial-intelligence-and-biotech-with-world-ba.
[32] EURAXESS Serbia (2024). "Startup Hub welcomes six new members." https://www.euraxess.rs/serbia/news/startup-hub-welcomes-six-new-members

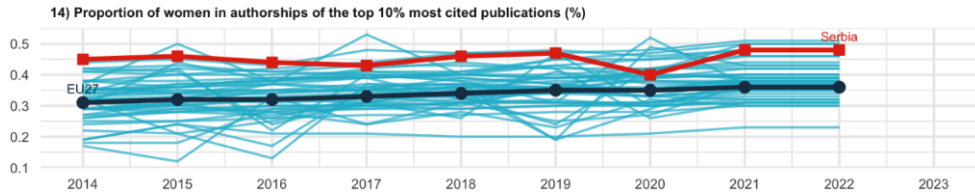
the EU R&I framework. This report also finds necessary investments are underway to implement Serbian R&I policies.

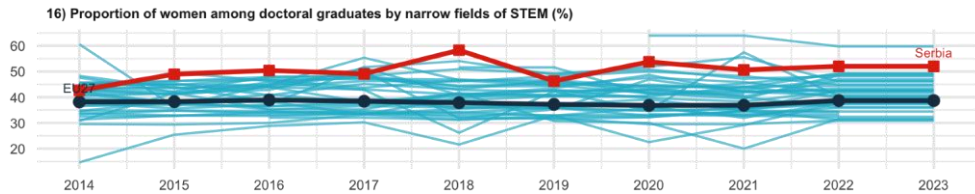
Serbia has developed policies and several projects in relation to **open science**. These efforts have translated into positive trends as evidenced by data. ERA Dashboard Indicators 6-8 show positive developments in this area in the last five years. In particular, the number of open-access publications is steadily increasing and above the EU27 average. Yet, the Serbian level of investment in EOSC and open sciences remains still low, which could impact the sustainability of these reforms. The number of repositories also is quite low compared to other EU countries. Another important topic in ERA is **gender equality** in research and innovation. ERA Dashboard Indicators 12-15 all show an overall positive trend in Serbia in recent years, e.g., in regard to the proportion of mixed-gender teams or women of Grade A among academic staff/researchers. Moreover, in majority of these indicators Serbia ranks above other EU average.

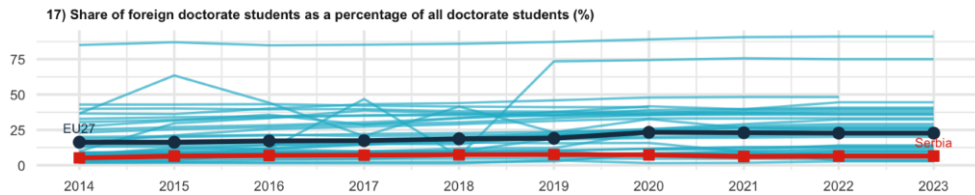
Figure 3-1 Indicators for ERA Priority 1

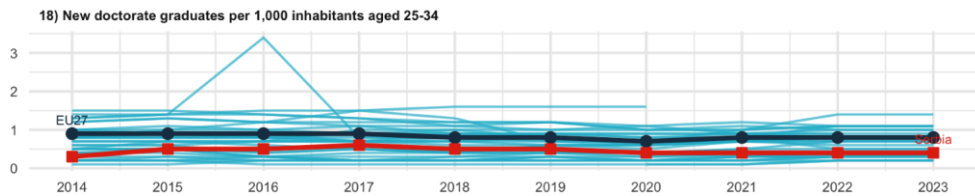

11) Number of European RIs in which a Member State or an Associated Country participates (total) - 2023
1
18
30
2
29
13
9
29
16
9
21.3
22
42
1
32
31
19
5
13
11
8
6
5
3
1
1
38
2
21
25
29
9
5
11
20
39
25
3
1
33
Albania
Austria
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Latvia
Lithuania
Luxembourg
Malta
Moldova
Montenegro
Netherlands
North Macedonia
Norway
Poland
Portugal
Romania
Serbia
Slovakia
Slovenia
Spain
Sweden
Turkey
Ukraine
United Kingdom

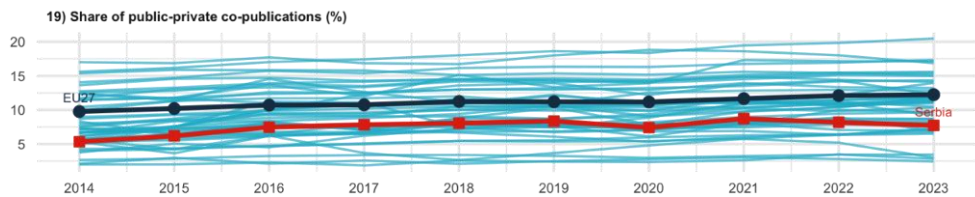

13) Proportion of mixed-gender teams (%)
Serbia
EU27
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


14) Proportion of women in authorships of the top 10% most cited publications (%)
Serbia
EU27
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


16) Proportion of women among doctoral graduates by narrow fields of STEM (%)
Serbia
EU27
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

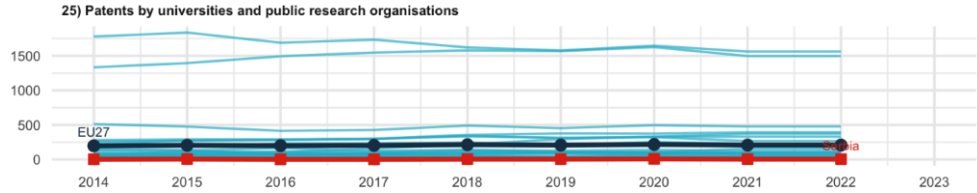

17) Share of foreign doctorate students as a percentage of all doctorate students (%)
EU27
Serbia
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

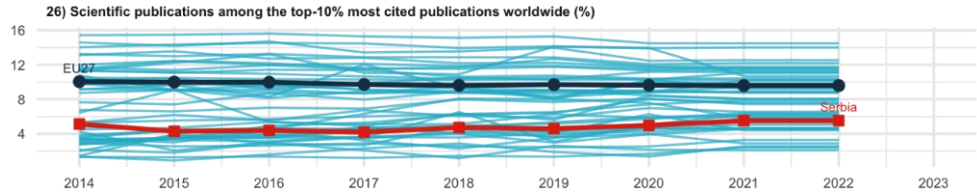

18) New doctorate graduates per 1,000 inhabitants aged 25-34
EU27
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

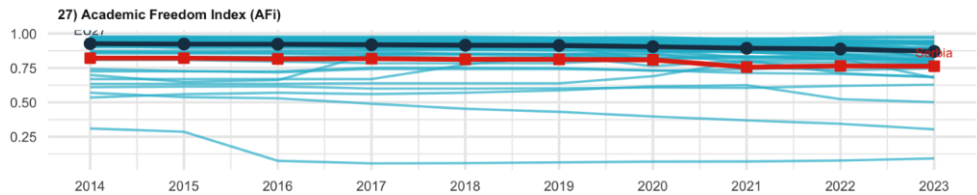

19) Share of public-private co-publications (%)
EU27
Serbia
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

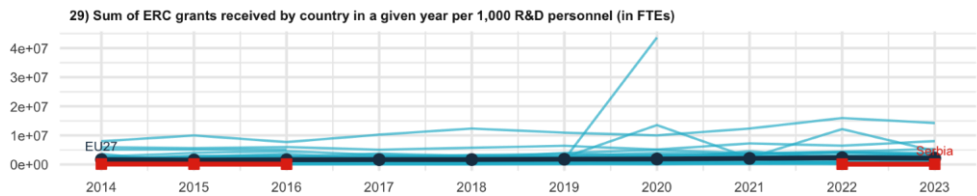

20) Best practice examples and methodologies for knowledge valorisation - 2023
30
20
10
0
10
25
2
2
6
4
1
7
9
11
2
1
7
13
3
4
3
1
21
1
11
1
1
1
6
13
6
6
Austria
Belgium
Croatia
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
Poland
Portugal
Romania
Serbia
Slovakia
Slovenia
Spain
Sweden
United Kingdom

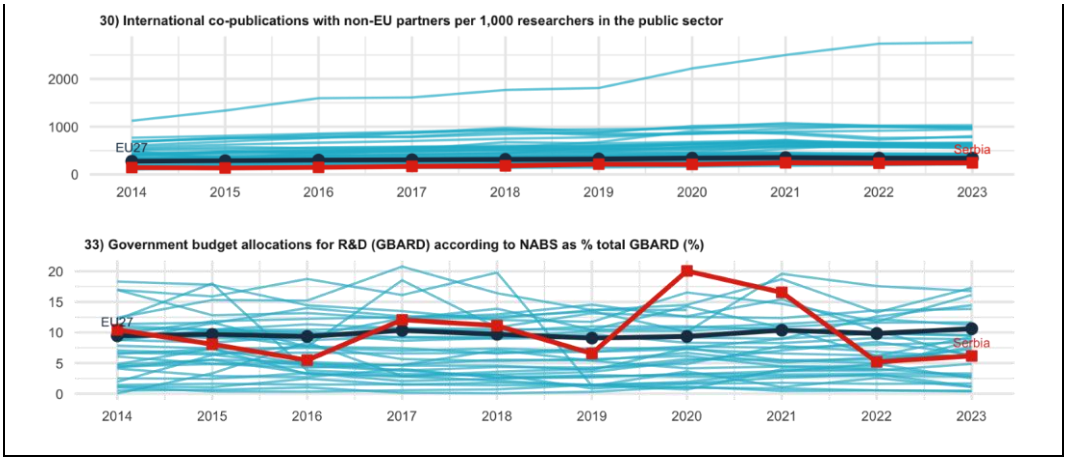

22) Share of innovating firms collaborating with HEI/PRO out of all innovative firms
40
30
20
10
EU27
Serbia
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


25) Patents by universities and public research organisations
1500
1000
500
0
EU27
Serbia
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


26) Scientific publications among the top-10% most cited publications worldwide (%)
16
12
8
4
EU27
Serbia
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


27) Academic Freedom Index (AFi)
1.00
0.75
0.50
0.25
Serbia
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

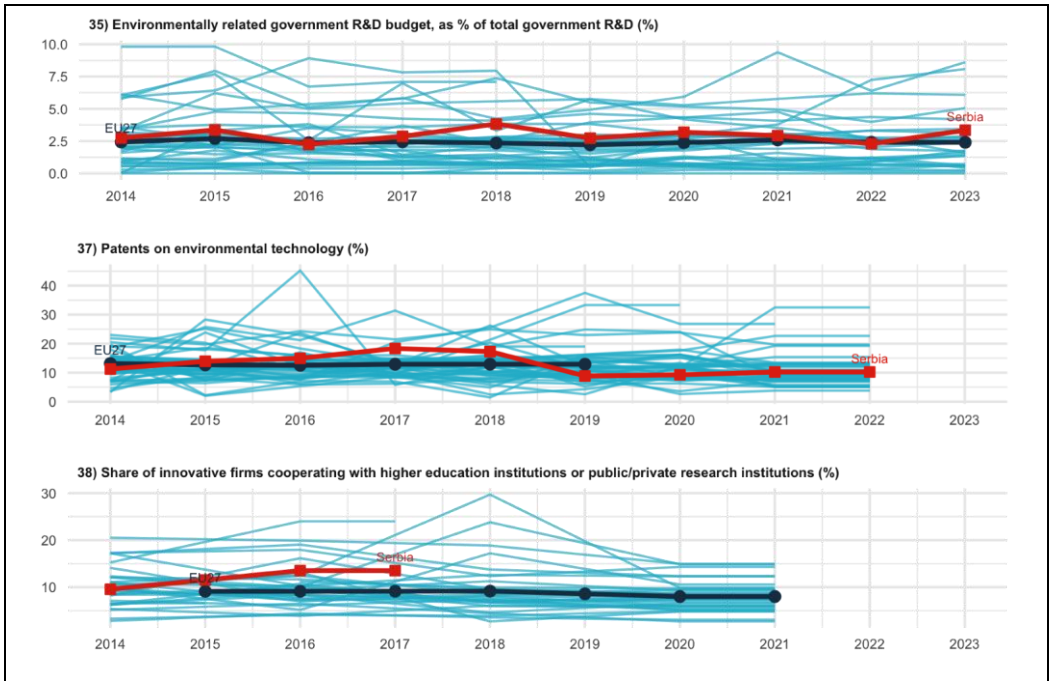

29) Sum of ERC grants received by country in a given year per 1,000 R&D personnel (in FTEs)
4e+07
3e+07
2e+07
1e+07
0e+00
EU27
Serbia
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

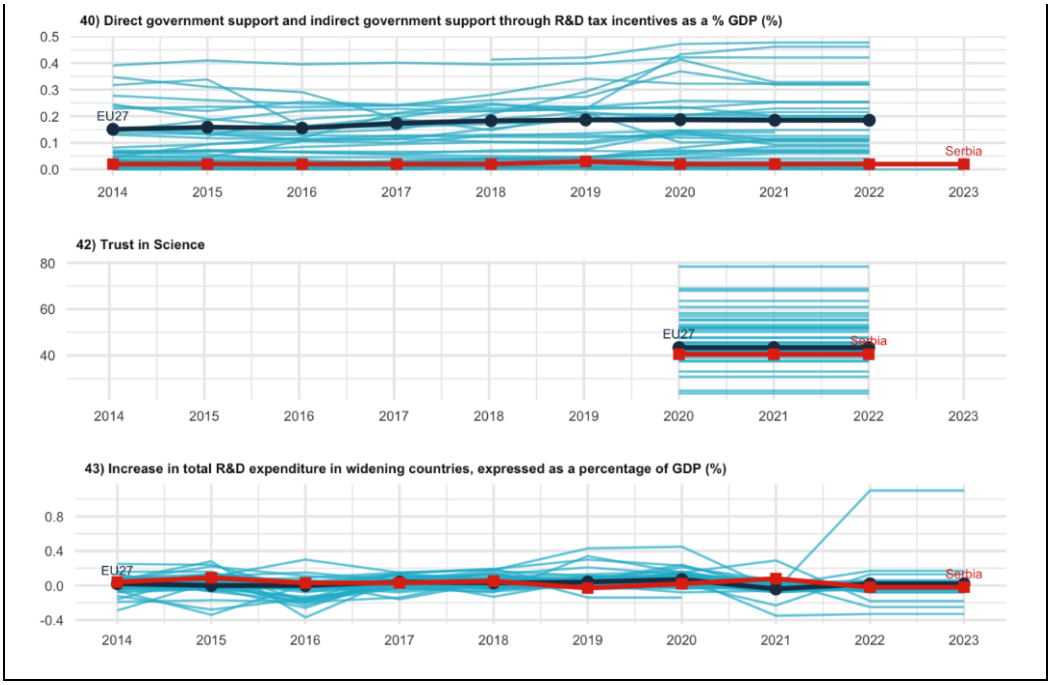


Source: Annex 1

ERA Priority 2 is addressed through various activities and measures through national initiatives on all ERA Actions (Missions, Partnerships, Green transformation, green/digital transition of industrial ecosystems, and Science to Citizens). Regarding **challenge-based ERA Actions,** ERA Dashboard Indicators 34-37 show a mixed picture, partly also because data points for more recent years are missing. It seems that overall, Serbia is mostly performing similar to the EU27 or in some instances bellow, with the overall trend not changing much. ERA Dashboard Indicator 42 shows that these remain important, as in Serbia, the trust in science is lower than in the EU27.

Figure 3-2 Indicators for ERA Priority 2

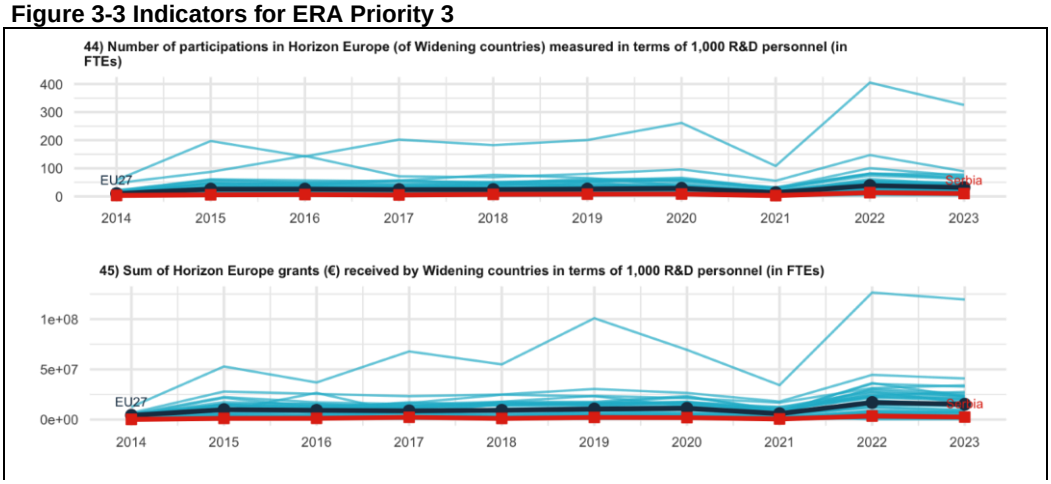


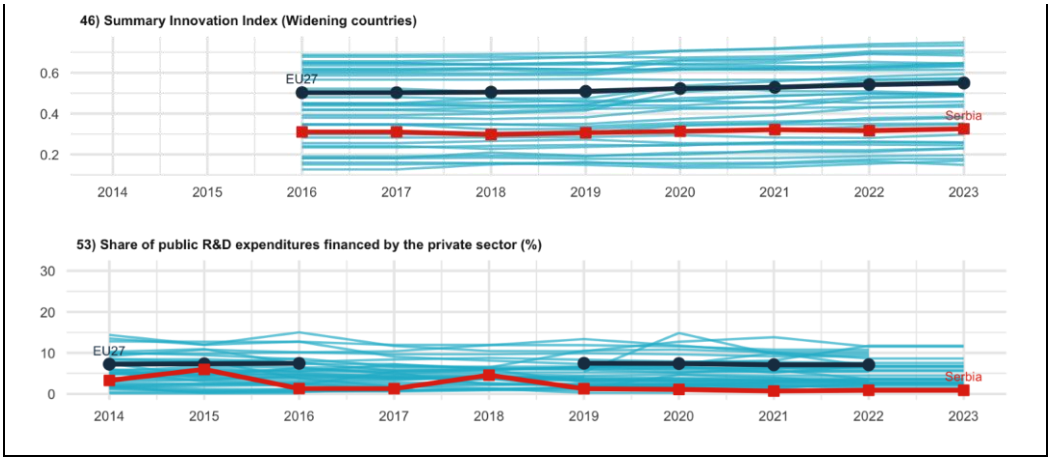


Source: Annex 1

ERA Priority 3 is addressed through a commitment to enhancing the strategic capacity of Europe's public research-performing organisations. The following ERA indicators tackle the interface between industry, business and academia. They showcase that Serbia is performing for many bellow the EU average, particularly for the private expenditure in R&D.

Figure 3-3 Indicators for ERA Priority 3

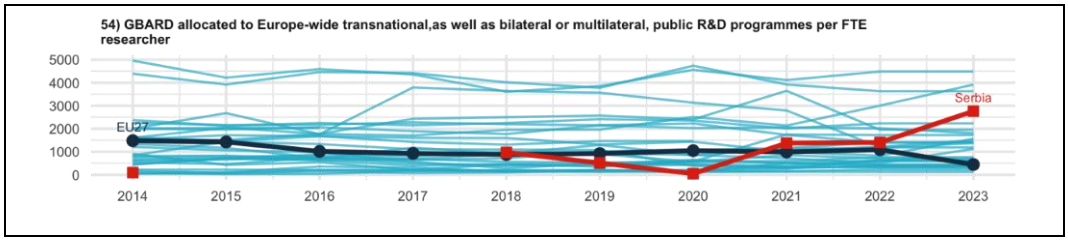




Source: Annex 1

In relation to **ERA Priority 4** Serbia has made ample progress, as measured by the respective ERA Dashboard Indicator 54. In 2023, Serbia's performance has been above the EU27 average.

Figure 3-4 Indicators for ERA Priority 4



Source: Annex 1

4. Effects of ERA Action implementation on the national R&I system

This chapter presents a qualitative assessment of the ERA Action commitments of Serbia and their effects on the national R&I system, including the quantitative performance in the ERA Dashboard.

The ERA Actions have influence on the Serbia's national research and innovation (R&I) system by fostering alignment with European priorities and facilitating integration into transnational research networks. Serbia's national R&I strategies, such as the Strategy for Scientific and Technological Development 2021-2025 and many other related R&I policies, emphasise goals consistent with ERA priorities, including fostering open science, advancing digitalisation, and addressing societal challenges like climate change and energy transition. Policies on knowledge transfer, innovation ecosystems, and international collaboration have been also set in motion indicating a deliberate effort to harmonise national priorities with ERA's overarching goals.

For example, ERA Action 9, which fosters international collaboration based on reciprocity, aligns with Serbia's aspirations to strengthen its participation in EU Framework Programmes like Horizon Europe and EU partnerships. National R&I funding calls have increasingly adopted criteria that encourage alignment with ERA principles, such as promoting interdisciplinary collaboration and capacity building in underdeveloped research areas. This alignment has resulted in enhanced opportunities for Serbian institutions to access EU funding and collaborate with international partners, strengthening the national R&I ecosystem.

Progress on achieving the ERA Priorities through related ERA Actions is partially reflected in available Dashboard Indicators for the 2022-2024 period. Serbia has shown improvement in areas such as international co-publications, participation in Horizon Europe projects, and investments in R&D as a percentage of GDP. However, challenges remain, particularly in the translation of research outputs into tangible economic benefits and the retention of skilled researchers within the country. The correlation between ERA Actions and dashboard indicators demonstrates a positive trajectory, but gaps persist in data collection and reporting, which limit comprehensive assessment. Continued efforts to align national policies with ERA priorities will be essential for further integration and leveraging the benefits of European collaboration in R&I.

5. Conclusions

Serbia, an Associated Country within the ERA, has not formally committed to specific ERA Policy Agenda Actions for 2022-2024. Despite this, Serbia has made significant strides in aligning its national research and innovation (R&I) framework with ERA priorities. Key developments include advancements in open science, as highlighted by the organisation of Open Science Day V and the presentation of a draft national open science policy. These efforts have led to positive trends, such as an increasing number of open-access publications and above-average performance compared to the EU-27 in this domain. Additionally, Serbia continually progresses in gender equality within research and innovation, with indicators showing a growing representation of mixed-gender teams and women in senior academic positions. However, challenges remain, including low investment in open science and a limited number of research institutions.

Further contributions to ERA objectives include Serbia's engagement in EU R&I partnerships and initiatives supporting green and digital transitions. As of 2024 Serbia is involved in 14 partnerships under the ERA framework. This level of engagement demonstrates Serbia’s active participation as a contributing partner. The country is actively involved in several ERA-related projects, such as the Processes4Planet initiative and partnerships like the European Rare Diseases Research Alliance. These activities underline Serbia's commitment to fostering innovation and international collaboration.

While Serbia's integration into ERA structures is ongoing, necessary reforms and investments are being implemented to strengthen its national R&I ecosystem. Progress is evident, but sustained investment and infrastructure development are critical for long-term alignment and integration into the ERA framework.

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Annex 1 – Full list of ERA priorities and indicators

The indicators used in the report are taken from the ERA Dashboard 2024. The full ERA Dashboard Report and the supporting Data Replication Package can be downloaded at https://european-research-area.ec.europa.eu/era-monitoring-reports. However, *GDP (in million €)*, *Size of the population (million)*, and *Share of female researchers, all sectors of performance (%)* were added to provide additional context and directly retrieved from the Eurostat website.

Additionally, EU and country averages are for 2023, except *Share of female researchers, all sectors of performance (%)* (2021).

Table 1 Structural Key Indicators:

Indicator number	Indicator	Source
/	GDP in euro per capita, current prices	Eurostat https://doi.org/10.2908/TEC00001
1	Gross Domestic Expenditure on R&D (GERD) as a share of GDP	Eurostat
2	Government Budget Allocations for R&D (GBARD) as share of GDP	Eurostat
4	Business Enterprise Expenditure on R&D (BERD) as a share of GDP	Eurostat
5.2	Expenditure on R&D procurement as a percentage of GDP	EC/European Innovation Procurement Observatory
/	Size of the population (million)	Eurostat, https://doi.org/10.2908/TPS00001
3	Researchers (in FTE) per million inhabitants	Eurostat
/	Share of female researchers, all sectors of performance (%)	Eurostat, https://doi.org/10.2908/TSC00005

Figure 3.1 Indicators for ERA Priority 1

Indicator number	Indicator	Source
6	Share of publications available in open access (green, gold, and diamond)	OpenAIRE
7	Number of open-access research datasets by country	OpenAIRE
8	Number of repositories by country	EOSC - Re3data
9	Country investments in EOSC and Open Science (in ranges of investment)	EOSC Observatory
10	Share of national public R&D expenditure committed to European research infrastructures	ESFRI
11	Number of European RIs in which a Member State or an Associated Country participates	ESFRI
12	Proportion of women of Grade A among academic staff/researchers	Women in Science - She Figures
13	(Corrected) Proportion of mixed-gender teams	EC_Scopus
14	(Corrected) Proportion of women in authorships of the top 10% most cited publications	EC_Scopus
15	Women in Digital index (0-100)	EC-Women in Digital Scoreboard

16	Proportion of women among doctoral graduates by narrow fields of STEM	Eurostat
17	Share of foreign doctorate students as a percentage of all doctorate students	Eurostat
18	New doctorate graduates per 1,000 inhabitants aged 25-34	Eurostat
19	Share of public-private co-publications	EC_Scopus
20	(Cumulative number of) Best practice examples and methodologies for knowledge valorisation	Knowledge Valorisation Platform
21	Number of PCT patent applications divided by GDP in million Euros/Dollars	OECD, Eurostat & World Bank
22	Share of innovating firms collaborating with HEI/PRO out of all innovative firms	Eurostat CIS (own calculations)
23	Business enterprise researchers as % of total researchers	OECD
24	Business enterprise researchers in full-time equivalent per thousand employment in industry	OECD
25	Patents by universities and public research organisations	EPO PATSTAT - Fraunhofer ISI calculations
26	% of scientific publications among the top-10% most cited publications worldwide	EC_Scopus
27	Academic Freedom Index (AFi)	V-Dem Varieties of Democracy
28	Average ranking score of top 10 universities by country and year	QS World University Ranking
29	Sum of ERC grants received by country in a given year per 1,000 R&D personnel (in FTEs)	EC-ERC
30	International co-publications with non-EU partners per 1,000 researchers in the public sector	EC_ScienceMetrix and Eurostat/OECD
31	Share of patents with foreign co-inventors	OECD
32	European and international co-patenting in EPO applications at national and EU level	Eurostat
33	Government budget allocations for R&D (GBARD) according to NABS as % total GBARD	Eurostat

Figure 3.2 Indicators for ERA Priority 2

Indicator number	Indicator	Source
34	Note: The ERA Dashboard Indicator 34 was removed from the Dashboard in January 2025. As a consequence, the indicator has also been omitted from the Country Report, while, however, keeping the original numbering of the indicators.	
35	Environmentally related government R&D budget, as % of total government R&D	Eurostat
36	National public and private investments as suggested in the SET Plan progress report 2021 (EUR million)	SETIS R&I data
37	% Patents on environmental technology	OECD
38	Share of innovative firms cooperating with higher education institutions or public/private research institutions	Eurostat CIS
39	Enterprises that purchased or licensed-in patents or other IPRs from public research organisations, universities or higher education institutions	Eurostat CIS

40	Direct government support and indirect government support through R&D tax incentives as a % GDP	OECD
41	Green bond issuance as a percentage of total bond issuance	Eurostat - EEA
42	Trust in Science	Eurobarometer 95.2
43	Increase in total R&D expenditure in widening countries, expressed as a percentage of GDP	Eurostat, OECD, UNESCO

Figure 3.3 Indicators for ERA Priority 3

Indicator number	Indicator	Source
44	Number of participations in Horizon Europe (of Widening countries) measured in terms of 1,000 R&D personnel (in FTEs)	Cordis - Eurostat
45	Sum of Horizon Europe grants (€) received by Widening countries in terms of 1,000 R&D personnel (in FTEs)	Cordis - Eurostat
46	Summary Innovation Index (Widening countries)	EC_EIS
47	Share of enterprises using public funds from different governance levels (local or regional, national, and EU) for R&I activities	Eurostat CIS
48	Number of Seal of Excellence projects on the InvestEU Portal per 1,000 R&D personnel (in FTEs)	EC - Invest EU
49	Number of collaboration networks of RPOs in Widening countries with other EU countries	Cordis - Horizon Dashboard
50	Average number of partners from non-widening countries per institution from a Widening country participating in the Horizon programme each year	Cordis - Eurostat
51	Share of patents registered by a Widening country together with partners from other EU countries	OECD
52	Share of innovative enterprises that cooperated with RPOs located in other countries	Eurostat CIS
53	Share of public R&D expenditures financed by the private sector	Eurostat

Figure 3.4 Indicators for ERA Priority 4

Indicator number	Indicator	Source
54	GBARD allocated to Europe-wide transnational, as well as bilateral or multilateral, public R&D programmes per FTE researcher	Eurostat

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