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ERA Country Report 2024
Bulgaria

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Report

Research and Innovation

ERA Country Report 2024: Bulgaria

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ERA Country Report 2024
Bulgaria

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Key takeaways

- Bulgaria has committed to seven out of 20 ERA Actions (4, 7, 8, 12, 13, 16, 17), covering three out of the four Priority Areas. The National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017-2030, the Innovation Strategy for Smart Specialisation (2021-2027), and the National Roadmap for Research Infrastructure 2020-2027 are the main national strategies on R&I in Bulgaria.

- Overall, Bulgaria is making progress within a number of ERA Actions addressing the barriers and enabling conditions. This is especially valid in making research careers more attractive and improving gender equality. At the same time, despite growth in the R&I budget, the available funding remains limited across a fragmented R&I system.

- There is an alignment between ERA Action implementation and national R&I priorities and strategies. One of the main priorities of the national R&I policy remains to achieve better synergy between Horizon Europe and the national funding instruments.

- The frequent parliamentary elections in the country (6 since 2021) result in the frequent change of executive power affecting the efficiency of the R&I planning process and the reporting on planned R&D programmes and act.

1. National context

Bulgaria is a *medium-sized* EU Member State in terms of its population. Its researcher base is concentrated in the public sector, and in particular - in universities. Bulgaria is categorised as an *Emerging Innovator* in the latest 2024 European Innovation Scoreboard.[1] Bulgaria's share of female researchers is high at 51%. Thanks to the strongly developing ICT sector, the share of ICT professionals in Bulgaria has grown from 3.8% to 4.3% in 2023 but is still below the EU average (in 2023).

Table 1 Structural Key Indicators

Indicator	EU27	Bulgaria		
	2023	2023	Average 2018-2020	Average 2021-2023
GDP (in million €) in current prices, euro per capita	35 790.00	13 270.00	8 080.00	10 826.67
Gross Domestic Expenditure on R&D (GERD) as a share of GDP	2.27	0.75	0.81	0.76
Government Budget Allocations for R&D (GBARD) as share of GDP	0.73	0.23	0.22	0.23
Business Enterprise expenditure on R&D (BERD) as a share of GDP	1.52	0.51	0.56	0.51
Expenditure on R&D procurement as a percentage of GDP	0.06	0.02	/	0.02
Size of the population (million)	448.80	6.45	6.66	6.49
Researchers (in FTE) per million inhabitants	4 681.34	2 697.58	2 509.20	2 626.60
Share of female researchers, all sectors of performance (%)	33.71	/	46.38	/

Source: Annex 1

2. Status of the Implementation of the ERA Policy Agenda

Bulgaria has committed to seven out of 20 ERA Actions, covering three out of the four ERA Priority Areas (see Table 2; Actions Bulgaria has committed to are coloured). The National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017-2030 and the National Roadmap for Research Infrastructure 2020-2027 are the main national strategies on R&I in Bulgaria. They have been developed in view of the strategic documents at national level – National Development Programme BULGARIA 2030 and Innovation Strategy for Smart Specialisation 2021-2027.[2] Focus areas of the national ERA implementation are ERA Priority Areas 1, 2, and 3.

[1] See https://projects.research-and-innovation.ec.europa.eu/en/statistics/performance-indicators/european-innovation-scoreboard/eis-2024#/eis/countries/BG

[2] It should be noted that Bulgaria held six parliamentary elections during the period from 2021 until 2024. Before the most recent elections in June 2024, there were five interim governments. These interim governments, which normally are limited to terms of three months, had longer mandates and were involved in internal and foreign affairs in a critical period, including the Covid-19 pandemic and the Russian invasion of Ukraine, and the reforms in relation to the Recovery and Resilience Plan. This affected the efficiency of the planning process and the reporting on R&I policy.

Table 2 Commitment to ERA Actions

1: Deepening a truly functioning internal market for knowledge								
1. Enable Open Science, including through EOSC	2. Propose an EU copyright and data legislative framework for research	3. Reform the Assessment System for research, researchers and institutions	4. Promote attractive research careers, talent circulation and mobility	5. Promote gender equality and foster inclusiveness	6. Protect academic freedom in Europe	7. Upgrade EU guidance for a better knowledge valorisation	8. Strengthen research infrastructures	9. Promote international cooperation
2: Taking up together the challenges posed by the twin green and digital transition, and increasing society's participation in the ERA					**3: Amplifying access R&I excellence across the Union**		**4: Advancing concerted research and innovation investments and reforms**	
10. Make EU R&I missions and partnerships key contributors to the ERA	11. An ERA for green transformation	12. Accelerate the green & digital transition of Europe's key industrial ecosystems	13. Empower Higher Education Institutions	14. Bring Science closer to citizens	16. Improve EU-wide access to excellence	17. Enhance public research institutions' strategic capacity	19. Establish an ERA monitoring system	

Source: European Commission (Note: Actions 15, 18 and 20 were not implemented)

Chapter 2 briefly summarises **new developments in Bulgaria since the publication of the ERA Country Report 2023**, based on the commitments to ERA Actions. The findings are based on qualitative desk research and interviews.

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

ERA Action 4) Promote attractive research careers, talent circulation and mobility

The doctoral stipends have been increased by 23% in 2024 and in the legislation, there is currently a link between the remuneration of researchers and the average wage. This is expected to attract young and motivated people as lecturers in HEI and as researchers in scientific organisations. More specifically, the minimum basic salary for the lowest academic position in state HEI is now set at not less than 125% of the average gross salary for the country for the last 12 months. The salary of researchers, specialists and experts hired by HEI is now set to not less than the average gross salary for the country for the last 12 months for the positions for which higher education is required.[3] The two national programs for the reintegration of Bulgarian scientists and attracting foreign researchers to work in Bulgaria ("VIHREN" and "Petar Beron") will be continued. A Swiss-Bulgarian reintegration programme PROMYS is under implementation. Competitions for young scientists, doctoral students and postdoctoral students and additional doctoral scholarships are introduced. Specialisations of scientists in leading national and European science and innovation centers are supported – Swiss-Bulgarian exchange programme for young scientists is under implementation. It is expected that these efforts will result in making the research careers more attractive and encourage the circulation of talent.

ERA Action 7) Upgrade EU guidance for better knowledge valorisation

The newly adopted Research and Innovation Act (promulgated, State Gazette 39 of 1 May 2024) has addressed knowledge transfer, open science and the Bulgarian Open Science Portal. The associated regulations are yet to be drafted. They will address the transfer of technologies, know-how, intellectual rights and other aspects of the transfer of knowledge and technologies.

[3] Resolution 274 dated 7 August 2024 of the Council of Ministers and Art. 92, Para 3 and 4 of the Higher Education Act.

ERA Action 8) Strengthen research infrastructures

The implementation of the National Roadmap for Research Infrastructure 2020-2027 is ongoing. There are 51 research infrastructures (incl. 15 centres of competence and centres of excellence), of which in general some 30 receive national financing and the rest are EU-funded. The development of both types of centres is almost entirely completed, and a decision is taken for the new programming period, to involve them in the implementation of research programmes, which requires the centres to be legally registered. Recommendations by the European Commission[4] on this matter are taken into consideration. Action plans are yet to be developed and approved.

According to the Operational Plan for the Implementation of the Second Stage of the National Strategy for the Development of Scientific Research in the Republic of Bulgaria 2017-2030, in 2024, two new research infrastructures must be built and one new partnership in a European consortium must be signed.

Details should be available in the interim reports and the updates on the implementation of the National Roadmap for Research Infrastructure 2020-2027, the Innovation Strategy for Smart Specialisation 2021-2027 and the Research, Innovation Operational Programme for the period 2021-2027, expected in 2025.

ERA Priority 2: Taking up together the challenges posed by the twin green and digital transition, and increasing society's participation in the ERA

ERA Action 12) Accelerate the green/digital transition of Europe's key industrial ecosystems

In August 2024, the European Commission approved Bulgaria's Just Transition Plans for the regions of Pernik, Stara Zagora, Kyustendil. These plans envisage a reduction in emissions from coal-fired power plants by 2030 and their phased decommissioning by 2038. The process of creating new jobs and economic activities for a just climate transition will be supported by the Just Transition Fund. In addition to that, the centres for excellence and the centres for competence are already operational and expected to contribute to the implementation of the action. There are five thematic areas that are related to the green transition in Bulgaria, defined in the Innovation Strategy for Smart Specialisation. The projects financed under the Programme for Research, Innovation and Digitalisation for Smart Transformation 2021-2027 and the National Innovation Fund are aligned with these thematic areas. In 2024, Bulgaria has adopted Digital Transformation of Bulgaria 2024-2030[5] where the vision and the objectives for the country's digital transformation up to the year 2030 are outlined. It is mentioned in the document that there is a need to consolidate and achieve consistency between strategic documents on digital transformation. It is further mentioned that at the end of 2024 the Digital Bulgaria 2025 Programme will be fully integrated into the Digital Transformation Strategy, which will be developed in line with the country's commitments in the Recovery

[4] Strategic evaluation of the Bulgarian Centres of Competence and Centres of Excellence and recommendations for their further development, available online: https://ec.europa.eu/regional_policy/en/information/publications/reports/2021/strategic-evaluation-of-the-bulgarian-centres-of-competence-and-centres-of-excellence

[5] https://www.fmfib.bg/en/knowledgehub/document/113/overview

and Resilience Plan to reduce by 40% the number of strategic documents by the end of 2025 and with the forthcoming adoption of the Strategic Planning Act.
According to the Bulgaria 2024 Digital Decade Country Report, the country scores 91.9 out of 100 on the digitalisation of public services for businesses, above the EU average of 85.4 and showing a very strong dynamic.[6]

ERA Action 13) Empower Higher Education Institutions

The 2024 Law for the Promotion of Scientific Research and Innovation is a prerequisite for greater autonomy of the National Innovation Fund who supports cooperation and joint programmes between Bulgarian HEIs and scientific organisations and business in the fields of research, innovation, new technology development, technology transfer, entrepreneurial skills building and the promotion of innovation and technology. This is supported by the 7-year programme of the Fund which is expected to overlap with the EU programming periods. Changes to the Higher Education Act in 2021 and subsequent amendments in 2022 have introduced the possibility of acquiring the status of a research university. In late 2024, there are 10 such universities recognised. They receive funding under Pillar 2 of the Recovery and Resilience Plan.

ERA Priority 3: Amplifying access to research and innovation excellence across the Union

ERA Action 16) Improve EU-wide access to excellence

One of the efforts within this action is to support Bulgarian projects that have received a Seal of Excellence from the European Innovation Council but for which there was no financing under Horizon Europe or Horizon 2020. Under the portfolio of the Ministry of Innovation and Growth, a specific financing procedure has been developed, to finance such projects. In 2023, 12 projects were approved for financing, and in the first of 2024, one project was approved for financing.
With regards to widening measures supported, the H2START: Green Innovations in Hydrogen for Sustainable Energy Transition is a recent teaming project. Its main goal is to establish a Centre of Excellence for Research and Innovation in Hydrogen Technologies in the city of Stara Zagora, driving the development of cutting-edge technologies for renewable hydrogen production and integration while accelerating just transition and industry competitiveness in coal regions.
Efforts are also made in relation to the Chips Joint Undertaking.[7] The draft Decision of the Council of Ministers of the Republic of Bulgaria on the proposal to the National Assembly for ratification of the Administrative Agreement between the Chips Joint Undertaking and the Ministry of Innovation and Growth of the Republic of Bulgaria was adopted by the Council of Ministers by Decision No 179 of 18 March 2024 and submitted to the 49th National Assembly on 18 March 2024 (Signature 49-402-02-7). The Executive Agency for the Promotion of Small and Medium-sized Enterprises has also published invitation for expression of interest from Bulgarian participants for the establishment of a Chips Competence Centre for Bulgaria under the European Chips Act.

[6] https://digital-strategy.ec.europa.eu/en/node/12842/printable/pdf
[7] The Agreement was signed in Brussels on 9 January 2024 and in Sofia on 25 January 2024.

Bulgaria also joined the PRIMA (Partnership for R&I in the Mediterranean Area) in April 2024. Additionally, in 2024, Bulgaria declared its participation and financial committment in several partnerships, including for the Green and Digital Transition. Within its participation in the BIOEAST initiative, Bulgaria hosted the founding meeting of the BIOEAST HUB Bulgaria under the project "BOOSTING the bioeconomy transformation FOR (4) the BIOEAST macroregion (BOOST4BIOEAST)", funded by HE.

ERA Action 17) Enhance public research institutions' strategic capacity

An interactive map[8] has been created and is regularly updated to show the laboratories of the Centres of Excellence and Centres of Competence built under the Operational Programme "Science and Education for Smart Growth" 2014-2020. Information includes the thematic area; lab affiliation; partners; and funding value. The map covers the territory of the 28 administrative regions.

The development of the Centres of Excellence and Centres for Competences and their putting into operation continues with new procedures, including direct grant procedures under Research, Innovation and Digitalisation for Smart Transformation Programme 2021-2027.

The principle of open science is enshrined in Article 5 of the Research and Innovation Promotion Act. The Bulgarian Portal for Open Science Portal[9] is also included in the Act. Bulgaria also runs the Open Data Portal[10]. This national repository is multidisciplinary and welcomes doctoral dissertations and peer reviewed manuscripts or published versions of scientific publications, created by researchers. The National Spatial Data Portal is another infrastructure, which is for spatial information. INSPIRE[11] includes data sets, services and maps.

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

Bulgaria has not committed to ERA Actions under this priority area.

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 Bulgaria's performance in achieving the ERA objectives as defined in the Pact for R&I during the period 2022-2024.

Under **ERA Priority 1**, ERA Action 4 is progressing to make **research careers** more attractive and to overcome the main challenges for Bulgaria's research and innovation capabilities, namely: the need for a critical mass in human capital, insufficient research capacity and the need for additional funding for research and related facilities. On ERA Action 1, the Ministry of Education and Science has created two new working groups with focus on (1) open science and citizen science and (2) improving the research capacity by attracting back the Bul-

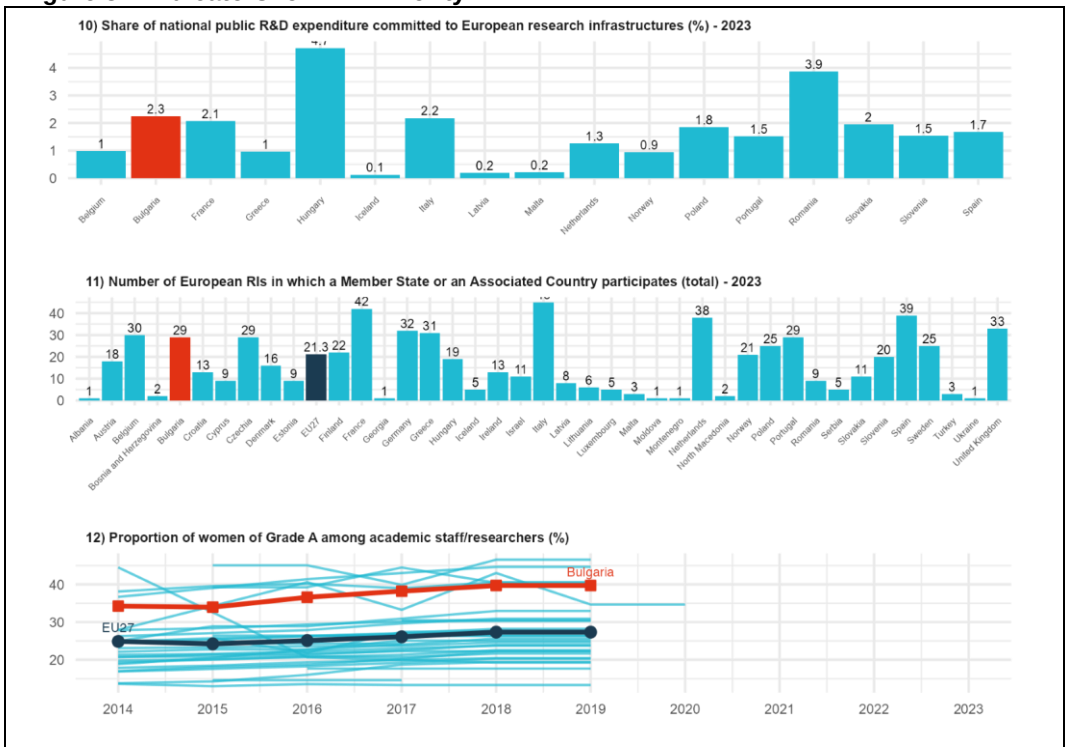
[8] See https://sf.mon.bg/?go=page&pageId=582
[9] https://bpos.bg/en/about-portal
[10] https://data.egov.bg/
[11] https://inspire.egov.bg/

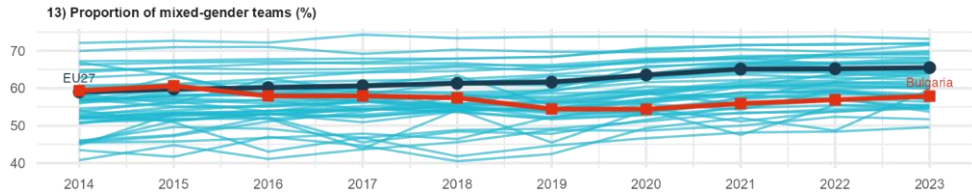
garian scientific diaspora. The increase of the doctoral stipends and the salaries of researchers is a step towards making the research careers more attractive in this way retaining talent in Bulgaria. It is recognised, however, that while being a necessary condition, increase of the salary is not the only factor for improving the prestige of the research profession. This is supported through the implementation of programmes for start-ups, accelerators and applied projects, development of centres of excellence, and synergies with EU and international research institutions.

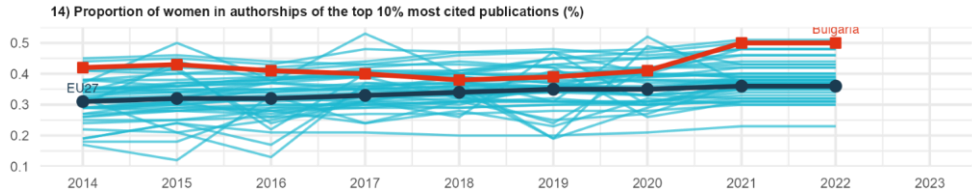
On other actions, Bulgaria shows a relatively strong performance on **research infrastructure** funding and participation (ERA Dashboard Indicators 10 and 11). In terms of **gender equality**, Bulgaria shows consistent positive results above the EU average of the proportion of women of Grade A among academic staff/researchers and the proportion of women in authorship of the top 10% most cited publications (ERA Dashboard Indicator 12 and 14). Some improvements are notable in the share of the mixed-gender teams (ERA Dashboard Indicator 13), though performance remains below its best results from 10 years ago and the EU27 average.

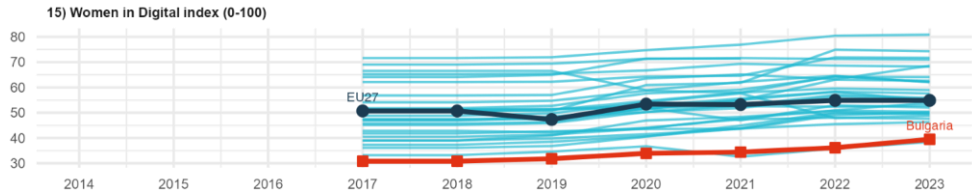
Although **funding for R&I** is growing (ERA Dashboard Indicator 33), the budget is still below EU average. In the case of the Ministry of Innovation and Growth, this is also relevant despite the fact that "Competitiveness and Innovation in Enterprises" is one of the leading programmes in terms of implementation and absorption of funds. The Programme is part of the CP package and while there is national co-financing, the majority of the budget is EU-funded. In relation to ERA Action 7 on **knowledge valorisation**, Bulgaria performs below the EU average in the associated ERA Dashboard Indicators on co-publications, patent applications, and collaboration with business, indicating that further action is advisable.

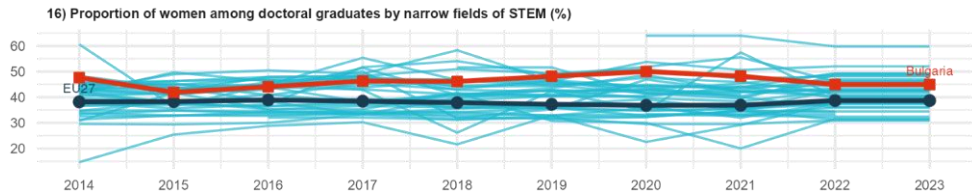
Figure 3-1 Indicators for ERA Priority 1

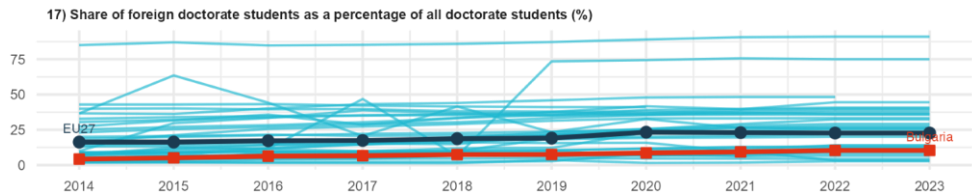


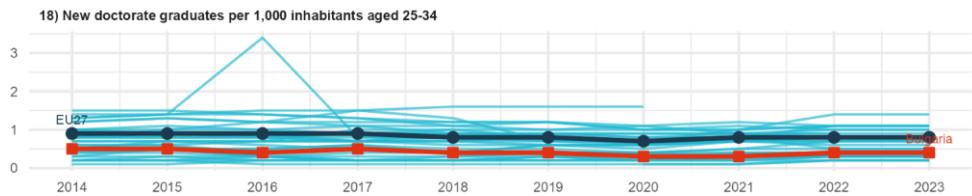

13) Proportion of mixed-gender teams (%)
70
60
50
40
EU27
Bulgaria
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

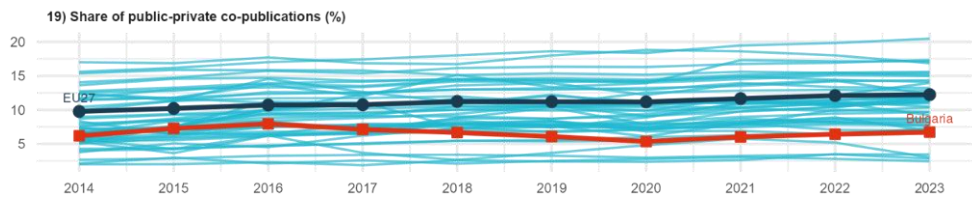

14) Proportion of women in authorships of the top 10% most cited publications (%)
0.5
0.4
0.3
0.2
0.1
EU27
Bulgaria
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


15) Women in Digital index (0-100)
80
70
60
50
40
30
EU27
Bulgaria
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

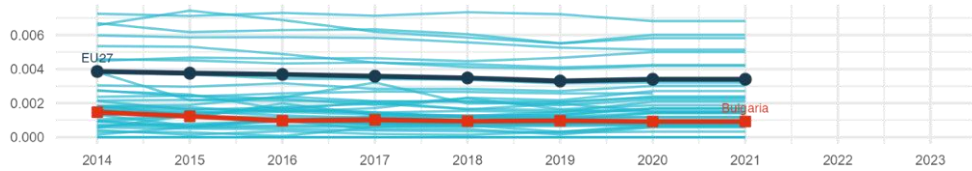

16) Proportion of women among doctoral graduates by narrow fields of STEM (%)
60
50
40
30
20
EU27
Bulgaria
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


17) Share of foreign doctorate students as a percentage of all doctorate students (%)
75
50
25
0
EU27
Bulgaria
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

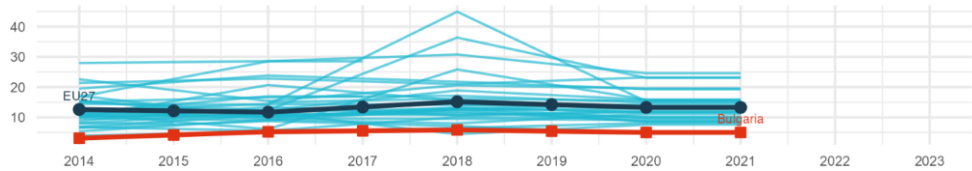

18) New doctorate graduates per 1,000 inhabitants aged 25-34
3
2
1
0
EU27
Bulgaria
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


19) Share of public-private co-publications (%)
20
15
10
5
EU27
Bulgaria
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

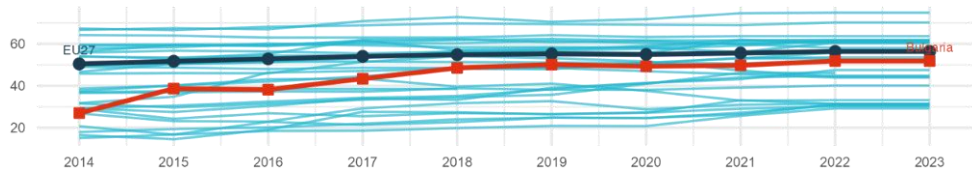
21) Number of PCT patent applications divided by GDP in million Euros/Dollars



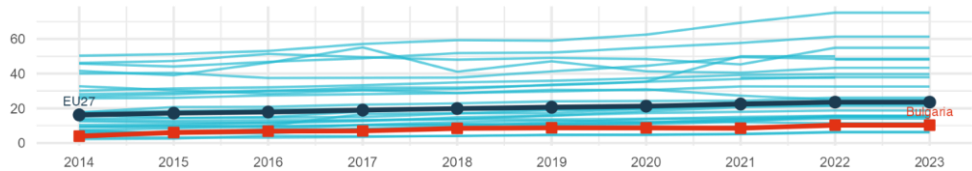
22) Share of innovating firms collaborating with HEI/PRO out of all innovative firms



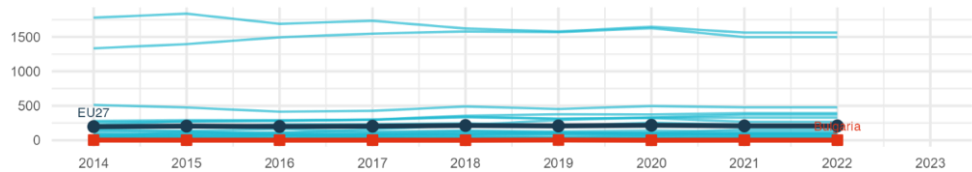
23) Business enterprise researchers as % of total researchers (%)



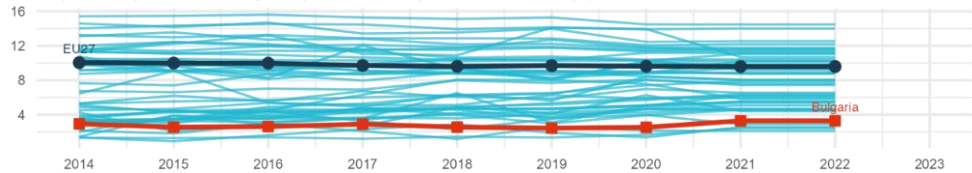
24) Business enterprise researchers in full-time equivalent per thousand employment in industry



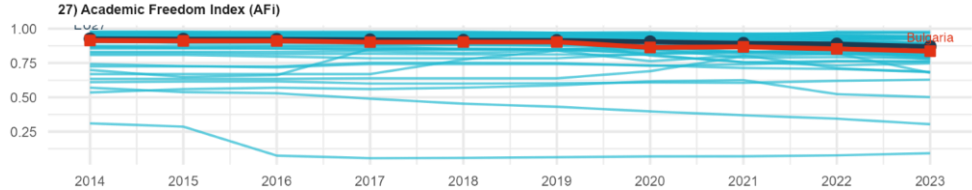
25) Patents by universities and public research organisations

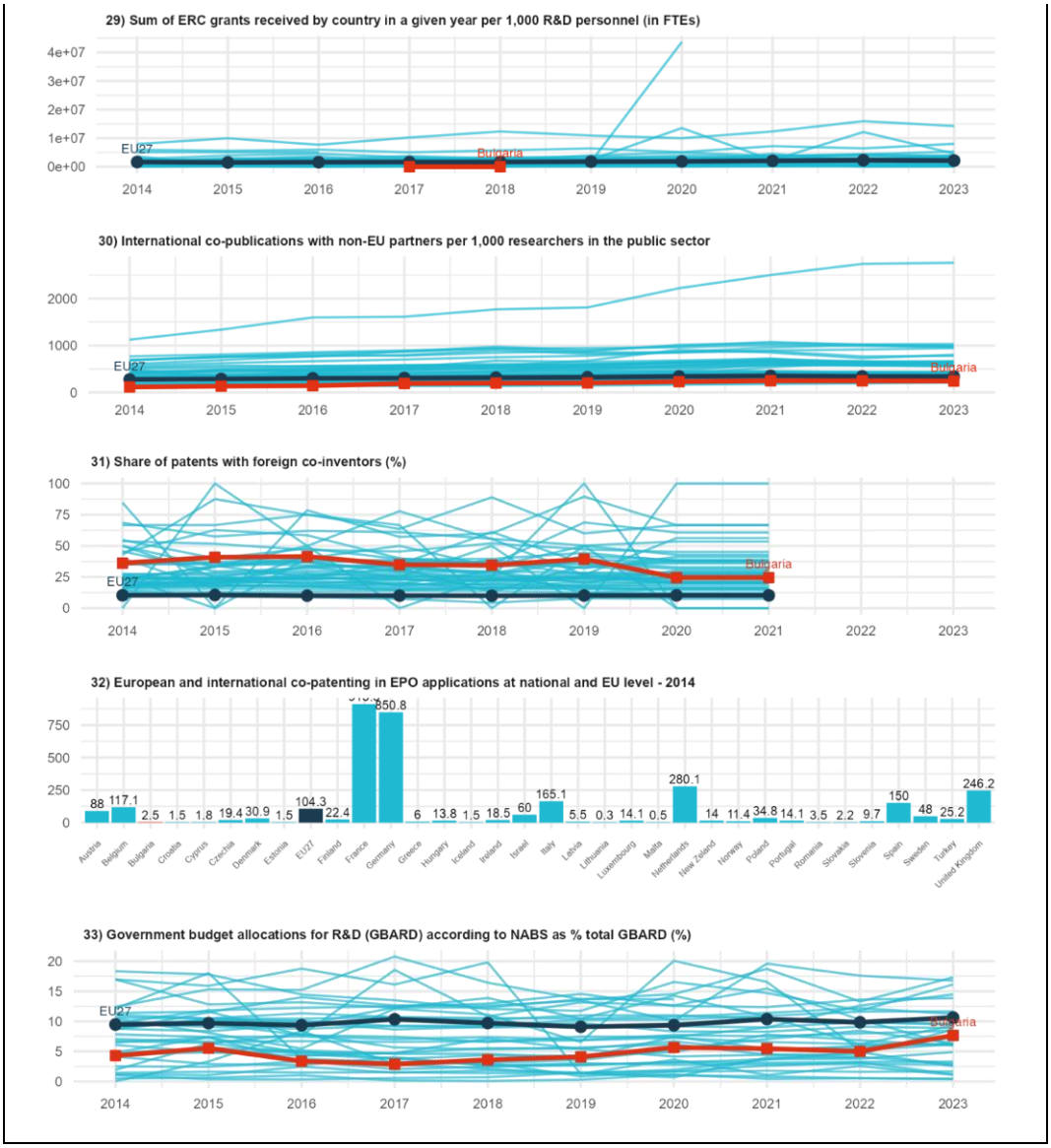


26) Scientific publications among the top-10% most cited publications worldwide (%)



27) Academic Freedom Index (AFi)





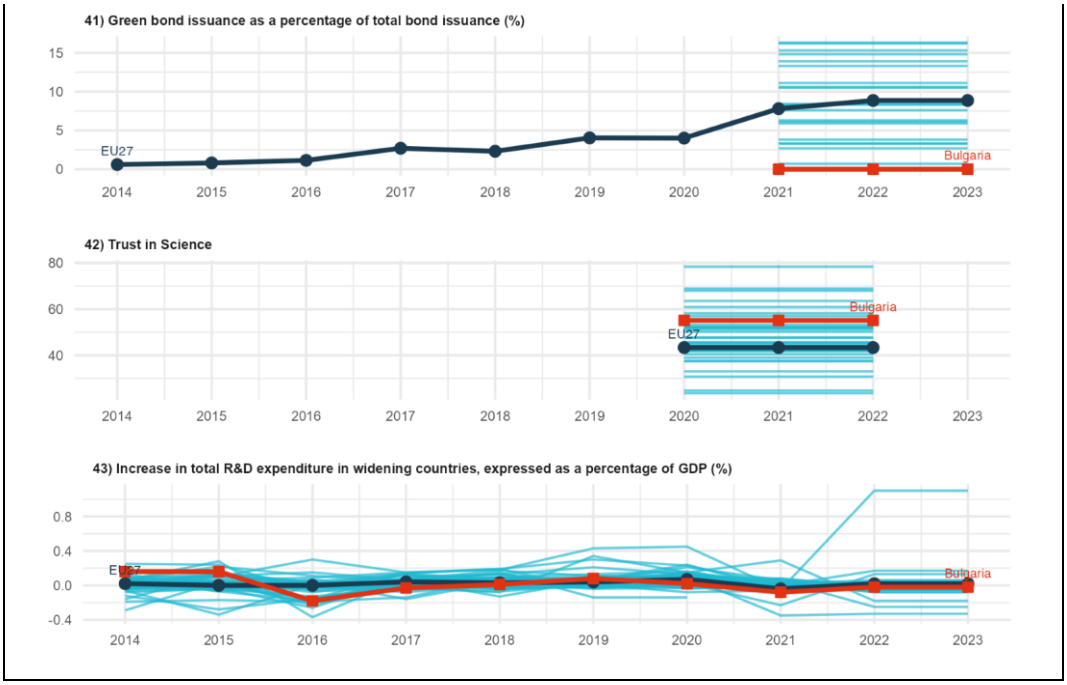
Source: Annex 1

Concerning **ERA Priority 2**, Bulgaria is committed to two ERA Actions. Indicators related to ERA Action 12 on the green and digital transition show that R&D budget on environmental topics saw increases in 2023 (ERA Dashboard Indicator 35). No new data is available on SET Plan-related investments (ERA Dashboard Indicator 36) and patents on environmental technology (ERA Dashboard Indicator 37). Bulgaria has announced funding for 249 renewable energy and energy storage projects, with a combined value of nearly 526 million Bulgarian lev (approximately €269 million). These projects are expected to add about 3 GW of renewable energy capacity and 1.2 GW of energy storage by March 2026, aligning with the country's objective to source over 34% of its energy from sustainable sources by 2030.[12] Indicators

[12] https://www.me.government.bg/news/249-proekta-za-proizvodstvo-na-elektroenergiya-ot-vei-i-sahranenie-na-elektroenergiya-na-obshta-stoinost-blizo-526-mln-lv-shte-badat-finansirani-po-npvu-3529.html

related to Higher Education Institutions, associated with ERA Action 13, also do not contain new data since 2021, complicating an assessment of the developments of the related ERA sub-prioirty.

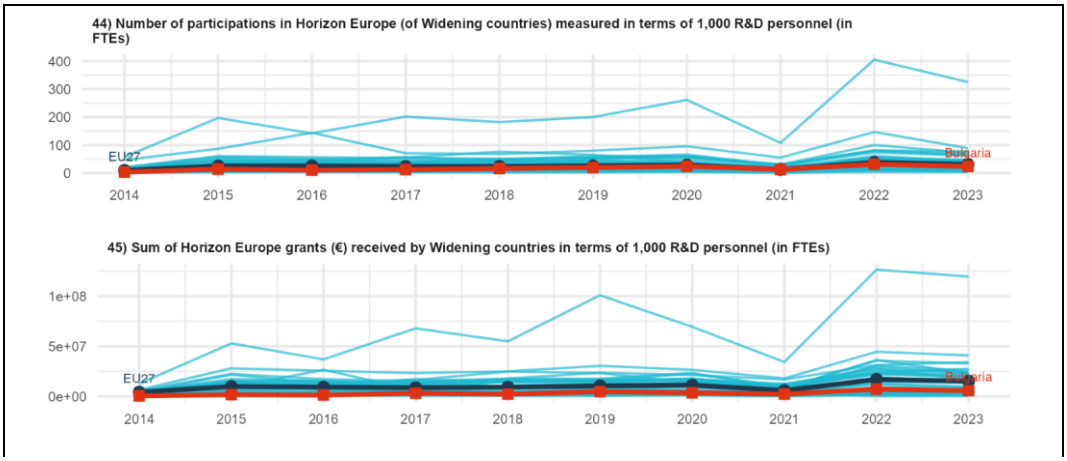
Figure 3-2 Indicators for ERA Priority 2

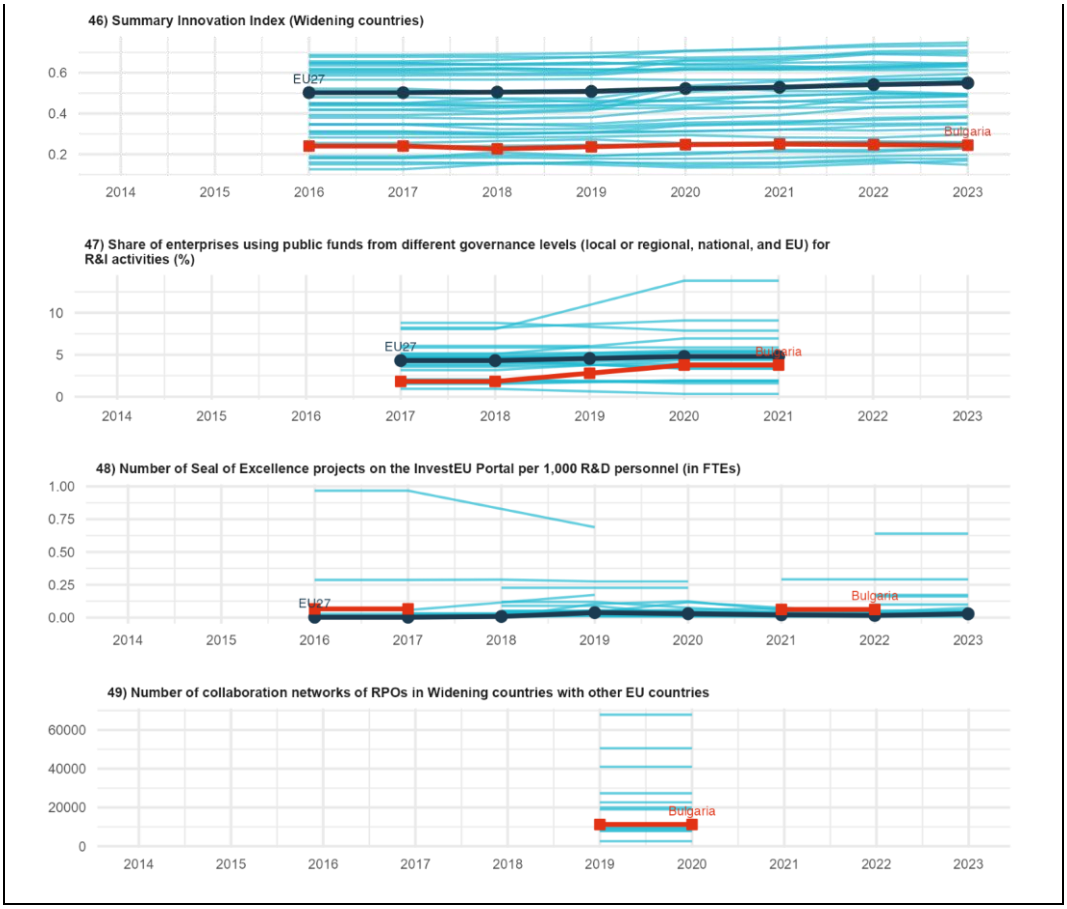


Source: Annex 1

In relation to **ERA Priority 3**, data suggests that Bulgaria is close to the average participation of widening countries in Horizon Europe (ERA Dashboard Indicator 44) and slightly below average in relation to the sum of Horizon Europe grants per 1,000 R&D personnel (ERA Dashboard Indicator 45). Data related to Action 17 is not consistenly available.

Figure 3-3 Indicators for ERA Priority 3





Source: See 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 Bulgaria and their effect on identified national R&I priorities, including the quantitative performance in the ERA Dashboard.

The main policy and strategic documents remain the National Development Programme Bulgaria 2021-2030, the Innovation Strategy for Smart Specialisation 2021-2027, the National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017- 2030, and the National Roadmap for Research Infrastructure 2020. The National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017- 2030[13] contains as an objective (specific objective 9) to broaden the participation of the Bulgarian scientific community in ERA and to expand international scientific cooperation, highlighting the effect of ERA objectives on national R&I priorities. Specific activities, together with the key performance indicators, are identified with the Operational Plan for the Implementation of the Second Stage of the National Strategy for the Development of Scientific Research in the Republic of Bulgaria

[13] Specifically, section 3.4 Integration into the European Research Area and international scientific community

2017-2030. The newly introduced Law for the Promotion of Scientific Research and Innovation is a decisive step in establishing a comprehensive framework that guides state policy in the research and innovation sector and aligningthe state policies for promotion of research and innovation between the Ministry of Education and Science and the Ministry of Innovation and Growth which remain the key national institutions in the field of R&I. This legal framework is designed to modernise Bulgaria's approach to innovation by promoting technology transfer, safeguarding intellectual property rights, and ensuring that the country's R&I efforts contribute significantly to economic and technological advancement.

While there is an alignment between ERA Action implementation and national R&I priorities and strategies, one of the main intended effects at national level remains to achieve better synergy between Horizon Europe and the national funding instruments. Science and innovation programmes for start-ups, accelerators and applied projects are being implemented and the internationalisation of science is being sought in line with ERA objectives.

5. Conclusions

Overall, Bulgaria is making progress on its commitment to seven ERA Actions, as highlighted in Chapter 2. The activities that Bulgaria has committed to are in proportion to the available budget which – despite the recent increase – remains insufficient to help Bulgaria move from its current place of Emerging Innovator. Bulgaria's research and innovation system is also suffering underfunding and a highly fragmented public research landscape. Since Bulgaria has been unable to increase its public R&D intensity, the level remains well below the EU average, affecting the quality of the public science base.Thus, while there is an alignment between ERA Action implementation and national R&I priorities and strategies, one of the main national R&I priorities remains to achieve better synergies between Horizon Europe and the national funding instruments.

Important steps have been made in terms of open science (Action 1), knowledge valorisation (Action 7); funding of joint programmes between Bulgarian HEIs and scientific organisations and business (Action 13); and the establishment of a Chips Competence Centre for Bulgaria under the European Chips Act (Action 16). Bulgaria is also implementing its National Roadmap for Research Infrastructure 2020-2027 by including the centres of competence and centres of excellence in the implementation of research programmes and by making efforts to retain research talent in Bulgaria (Action 4). However, monitoring data is not available consistently, making a detailed assessment of the ERA Actions' effects difficult.

6. References

Law for the Promotion of Scientific Research; available at https://lex.bg/bg/laws/ldoc/2137242579

National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017-2030; available at https://www.eufunds.bg/bg/opseig/node/4623

Operational Plan for the Implementation of the First Stage of the National Strategy for the Development of Scientific Research in the Republic of Bulgaria 2017-2030; available at https://bpos.bg/assets/documents/%D0%9E%D0%BF%D0%B5%D1%80%D0%B0%D1%82%D0%B8%D0%B2%D0%B5%D0%BD%20%D0%BF%D0%BB%D0%B0%D0%BD%20%D0%B7%D0%B0%20%D0%B8%D0%B7%D0%BF%D1%8A%D0%BB%D0%BD%D0%B5%D0%BD%D0%B8%D0%B5%20%D0%BD%D0%B0%20%D1%81%D1%82%D1%80%D0%B0%D1%82%D0%B5%D0%B3%D0%B8%D1%8F%D1%82%D0%B0.pdf

Operational Plan for the Implementation of the Second Stage of the National Strategy for the Development of Scientific Research in the Republic of Bulgaria 2017-2030; working document provided by the Ministry of Education and Science

Report on the implementation of the budget of the Ministry of Innovation and Growth for the first half of 2024; available at https://www.mig.government.bg/wp-content/uploads/2024/08/otchet-za-izpalnenieto-na-programniya-byudzhet-na-mir-za-parvoto-polugodie-na-2024-g.pdf

Annex 1 – List of ERA 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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