European Commission

ERA Country Report 2023
Montenegro

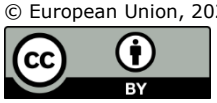
Independent
Expert
Report

Research and Innovation

ERA Country Report 2023: Montenegro

European Commission
Directorate-General for Research and Innovation
Directorate A — ERA & Innovation
Unit A2 — ERA, Spreading Excellence and Research Careers
Contact Manuel Aleixo, Head of Unit A.2
Heiko Prange-Gstoehl
Marlene Schoder-Kienbeck
Email RTD-ERA-FORUM@ec.europa.eu
RTD-PUBLICATIONS@ec.europa.eu
European Commission
B-1049 Brussels

Manuscript completed in January 2024



EUROPEAN COMMISSION

ERA Country Report 2023 Montenegro

Edited by Domagoj Racic (Independent Science, Technology and Innovation policy expert)

as part of 'Development of the ERA Scoreboard, the ERA Dashboard and the Regular Reports' project for the European Commission, Directorate-General for Research and Innovation under Framework Contract N° 2018/RTD/A2/OP/PP-07001-2018 Lot 2 (EDAR)

2024 Directorate-General for Research and Innovation EN

Table of contents

ERA COUNTRY REPORT 2023: MONTENEGRO

Key takeaways:

- Montenegro is an Emerging Innovator according to the European Innovation Scoreboard 2023, performing at 47% of the EU-27 average. Its performance is improving at a rate just below that of the EU-27 (8.5 percentage points) and below the Emerging Innovators' average.
- Despite not having committed to the ERA Policy Agenda actions, Montenegro is implementing several initiatives contributing towards the ERA priorities, with a key role played by the Smart Specialisation Strategy of the Republic of Montenegro 2019-2024.
- The advancement of Montenegro towards ERA priorities is primarily determined by its internal capacity to reform its R&I system and mobilising resources to steer its development.

1. National context

1.1. Overview of the ERA policy agenda implementation

According to the European Innovation Scoreboard 2023,[1] Montenegro is an **Emerging Innovator** performing at 47% of the EU-27 average. Its performance is improving at a rate just below that of the EU-27 (8.5% percentage points) and is under the average of the Emerging Innovators. In this context, the country's performance gap with the EU-27 increased in recent years.

Regarding the ERA Policy Agenda, Montenegro has yet to commit to the ERA Policy Agenda actions, but its R&I policy has been moving towards ERA priorities. **The Smart Specialisation Strategy** of the Republic of Montenegro 2019-2024[2] as well as the **Strategy for Scientific Research Activities**[3] play pivotal roles in the R&I system.

In general, Montenegro is at a good level of preparation in science and research due to the implementation of the smart specialisation strategy, increasing participation in the Horizon Europe programme, and increasing government spending on science and innovation in 2023 (Chapter 25).[4] [5]

[1] European Commission (2023). European Innovation Scoreboard 2023 – Country profile Montenegro. Brussels: European Commission.
[2] Government of Montenegro (2019). Smart Specialisation Strategy of Montenegro 2019 – 2024 (*Strategija pametne specijalizacije Crne Gore 2019. – 2024.*). Podgorica: Government of Montenegro.
[3] European Commission (2023a). Commission staff working document: 2023 Country Report – Montenegro. SWD(2023) 694 final. Brussels: European Commission.
[4] European Commission (2022). Commission staff working document: 2022 Country Report – Montenegro. SWD(2022) 335 final. Brussels: European Commission.
[5] European Commission (2023a). Commission staff working document: 2023 Country Report – Montenegro. SWD (2023) 694 final. Brussels: European Commission.

The key responsible institution for the development and implementation of the R&I system and policies is the **Ministry of Science and Technological Development**.[6] The **Ministry of Education** is responsible for higher education institutions. The research projects these ministries manage are financed from the national budget, whereas innovation activities are financed through the **Innovation Fund**.

In 2020, the Ministry of Education adopted the **Programme for the Implementation of Open Science Principles** with the Action Plan (2020-2022).[7] The **Development Strategy for micro, small and medium-sized enterprises** in Montenegro 2023-2026 with Action Plan,[8] the **Intellectual Property Strategy** 2023-2026 with Action Plan for 2023[9] and the **Innovation Programme** 2023-2027[10] were adopted in July 2023. The Strategy of Higher Education of Montenegro for 2023-2026 was drafted and submitted for public consultation.[11] The Strategy for Scientific Research Activities, which will define the research funding models and instruments to increase the number of researchers, is being developed incorporating ERA priorities.

Simultaneously, a new **Law on Scientific Research Activity** is being drafted. The current law regulating research is the **Law on Scientific Research Activity**[12] from 2010 (amended in 2011, 2014 and 2020). Laws regulating innovation include the **Law on Innovation Activity**[13] and the **Law on Incentive Measures for the Development of Research and Innovation**[14] adopted in 2020.

As for the priorities for 2023, the emphasis was on the further advancement in the implementation of the **Smart Specialisation Strategy**.[15] One of the main objectives is to make the Innovation Fund fully operational, strengthening science-industry cooperation structures and further supporting the knowledge transfer between them. In addition, it aims to increase the investment in research and innovation programmes and participation in the **Horizon Europe programme**[16] while fostering the participation of women. An increased budget in the R&I area is necessary to support economic recovery and competitiveness while helping tackle the brain drain of researchers and other younger experts and professionals.

[6] https://www.gov.me/en/mntr
[7] Ministry of Education (2020). Programme for the Implementation of Open Science Principles with the Action Plan (2020 - 2022). Podgorica: Ministry of Education.
[8] Government of Montenegro (2023). Strategy for Micro, Small and Medium-Sized Enterprises Development in Montenegro 2023 – 2026. Podgorica: Government of Montenegro.
[9] Government of Montenegro (2023a). Intellectual Property Strategy of Montenegro for the Period 2023 – 2026 with Action Plan for 2023. Podgorica: Government of Montenegro.
[10] Ministry of Science and Technology Development (2023). Innovation Programme 2023 - 2027. Podgorica: Ministry of Science and Technology Development.
[11] Ministry of Education (2023). Strategy of Higher Education Development of Montenegro for the period 2023 – 2026. Draft for public consultation. Podgorica: Ministry of Education.
[12] Law on Scientific Research Activity, Službeni list Crne Gore 080/10 (31 December 2010), 040/11 (8 August 2011), 057/14 (26 December 2014), 082/20 (6 August 2020).
[13] Law on Innovation Activity, Službeni list Crne Gore 82/20 (6 August 2020).
[14] Law on Incentive Measures for the Development of Research and Innovation, Službeni list Crne Gore 82/20 (6 August 2020).
[15] https://www.gov.me/en/documents/ea1d661e-922a-4d42-af8d-ae55bc53988e
[16] https://commission.europa.eu/funding-tenders/find-funding/eu-funding-programmes/horizon-europe_en

2. Assessment of the Implementation of the ERA Policy Agenda and ERA Priorities

Although Montenegro has not committed to any ERA action, some activities contribute to its R&I development in the European context. The rest of the section will focus on the progress observed, as measured by the indicators in each ERA Priority Area.

The quantitative information presents the most recent data for the ERA Scoreboard and ERA Dashboard indicators.[17] However, in some cases, the data available pre-dates the ERA Policy Agenda. This report will serve as a baseline for reporting in the future. Therefore, the longer-term trends covering the last ten years are presented. It should also be mentioned that the data related to many indicators are unavailable, limiting the conclusion that can be drawn. The indicators falling under each ERA priority are presented below, and the general indicators are outlined in Table 1. More detailed information on the data and graphs can be found in Annex 1.

Table 1. General ERA Scoreboard and ERA Dashboard indicators[18]

Indicator	Most Recent Metric
Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP	0.5 (2021)
Researchers (in full-time equivalent) per million inhabitants	4,763.5 (2021)
Business Enterprise expenditure on R&D (BERD) as a percentage of GDP	0.2 (2018)

Source: compiled by research team based on the ERA Scoreboard and ERA Dashboard indicators

2.1. ERA Priority 1: Deepening a truly functional internal market for knowledge

2.1.1. State of play in the implementation of the ERA Actions

Montenegro has engaged with the different topics covered under ERA Priority 1 through national strategies focused on the specific areas of R&I.

In relation to **ERA Action 1:** *Enable Open Science, including through the European Open Science Cloud (EOSC),* since 2018, the Ministry of Science has been allocating funds to co-finance the publication of papers by Montenegrin researchers in open access journals.[19] Additionally, and covering **ERA Action 2:** *Propose an EU copyright and data legislative framework for research*, Montenegro participates in the **European Open Science Cloud (EOSC)**. Although such engagement is currently limited, the country aims to promote European collaboration on research data.

[17] See https://european-research-area.ec.europa.eu/era-monitoring-reports.
[18] Further information on the trends can be found in Annex 1
[19] Montenegro Ministry of Science and Technological Development public competition for grants for startups. EURAXESS. https://www.euraxess.me/montenegro/news-announcements/montenegro-ministry-science-and-technological-development-public

In 2010, three out of four universities in Montenegro signed declarations of endorsement of the **European Charter and Code for Researchers.**[20] In this sense, the country is establishing new initiatives surrounding **ERA Action 4:** *Promote attractive research careers, talent circulation and mobility*. However, the internationalisation of the labour market for researchers is low in Montenegro.

In terms of the **ERA Action 8:** *Strengthen research infrastructures.* Montenegro´s main research infrastructure is the **Innovation and Entrepreneurship Centre (IEC) Technopolis.** It is composed of a laboratory, a data centre and a Techlab, and is supported by different national ministries and the Investment and Development Fund.[21] Moreover, a partnership between the Government of Montenegro, the national Ministry of Science and the University of Montenegro developed the **Science and Technology Park (STP) Montenegro**, an innovation process instrument to promote entrepreneurship and start-ups.[22]

Montenegro has also improved on gender and inclusion initiatives and is aligned with **ERA Action 5:** *Promote gender equality and foster inclusiveness*. In 2021, the government implemented the **2021-2025 National Strategy for Gender Equality** and the **final Report on the Implementation of the 2017-2021 Action Plan for Achieving Gender Equality**. [23] These projects aimed to promote gender equality in Montenegro and to protect women´s rights in all areas, including the research and innovation system. However, there are still challenges related to the labour market as the legislation on gender is limited.

To improve the country´s position in the R&I international environment in relation to **ERA Action 7:** *Upgrade EU guidance for a better knowledge valorisation,* Montenegro supports the **Guiding Principles for Knowledge Valorisation** developed through **Horizon Europe**. The country engages with this initiative through financial support via open calls and the National Contact Points network. This initiative also promotes collaboration within the European countries and relates to **ERA Action 9:** *Promote international cooperation.* The country joined the **European Alliance of Innovation** at the European level while engaging in new international agreements with R&I institutions of neighbour countries such as the **Founder Institute of Serbia**.[24]

2.1.2. Progress towards achieving ERA Priorities

Within **Sub-priority 1.1:** *Open science*, when it comes to the ***share of open access scientific publications in total scientific publications,*** Montenegro´s performance between 2009 and 2019 has deteriorated. In 2019, the value for Montenegro was 40.84% (Figure 4 in Annex 1).

Regarding **Sub-priority 1.3:** *Gender equality, equal opportunities for all and inclusiveness*, the ***proportion of papers with mixed gender authorship*** has experienced some slight changes during the last decade. Although the proportion of mixed gender authorship remained around 40%, the values overall increased from 2010 to 2020 (Figure 5 in Annex 1). The ***proportion of women in authorships of the 10% most cited publications*** has

[20] EURAXESS Montenegro. https://www.euraxess.me/jobs/charter
[21] Innovation and Entrepreneurship Centre Tehnopolis. https://www.tehnopolis.me/online/en/home-eng/
[22] Science Tecnology Park of Montenegro. https://ntpark.me/en/
[23] 2021-2025 National Strategy for Gender Equality. https://www.gov.me/en/documents/610fc2e2-955a-4a9f-baf2-b48ca32099ff
[24] European Innovation Alliance. https://eai.eu/

fluctuated in Montenegro consistently from year to year, reaching the peak in 2016. As seen in Figure 6 in Annex 1, the latest available data in 2018 is around 38%.

In **Sub-priority 1.4:** *Researchers' careers and mobility and research assessment and reward systems*, the only available indicator is ***Job-to-job mobility of Human Resources in Science & Technology.*** In 2011 it reached 5.8%, but has been declining ever since. In 2020, it registered a value of 3.4%, probably due to the pandemic (Figure 7 in Annex 1).

In the area of **Sub-priority 1.6:** *Scientific leadership*, Figure 8 in Annex 1 shows that Montenegro's ***share of scientific publications among the top-10% most cited publications*** worldwide in all publications is very variable but at a relatively low level. In 2020, it was 4.2%. On the other hand, the ***Academic Freedom Index*** has traditionally been relatively low but increased sharply in 2021 (Figure 9 in Annex 1).

Sub-priority 1.7: *Global engagement* is measured by the ***number of international co-publications with non-EU partners per 1,000 researchers*** (Figure 10 in Annex 1), which has been growing consistently in Montenegro, reaching a 736 in 2022.

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

2.2.1. State of play in the implementation of the ERA Actions

Montenegro has developed a number of initiatives to strengthen the national R&I environment aligned with the ERA Priority 2 Actions.

In terms of **ERA Action 10:** *Make EU research and innovation missions and partnerships key contributors to the ERA,* Montenegro is one of the members of the **EU Climate and Smart Cities Mission**.[25] This mission covers the **lighthouse research infrastructure project** that focuses on sustainable materials, clean energy, health and circular economy. The project is developed in six different areas monitored by key leading institutions.[26]

Regarding **ERA Action 11:** *An ERA for green transformation* and **ERA Action 12:** *Accelerate the green/digital transition of Europe's key industrial ecosystems,* Montenegro is now preparing a new strategic cycle **focused on Healthy, Sustainable and Digitalised Montenegro**.[27] This is supported by the **Smart Specialisation Strategy of Montenegro 2019-2024**[28] that establishes energy and sustainable development as one of its main priorities. Additionally, the government adopted the **Programme for Innovation 2021-2024** for enterprise innovation, sustainable work and technology transferability.[29] It is promoted and funded mainly by the National Innovation Fund.

ERA Action 13: *Empower Higher Education Institutions* is led by the **University of Montenegro.** In recent years, the institution has promoted the implementation of new initiatives and more efficient strategies to improve the position of HEIs in the country's R&I

[25] Lighthouse Topics Project. EUREKA PRO. https://www.eurecapro.eu/research-lighthouse-missions/
[26] Ibid
[27] Knowledge and Innovation for Montenegro. https://www.undp.org/montenegro/stories/knowledge-and-innovation-healthy-and-sustainable-montenegro
[28] Smart Specialisation Strategy of Montenegro. https://www.gov.me/en/documents/ea1d661e-922a-4d42-af8d-ae55bc53988e
[29] Ibid

environment. Recently, the University of Montenegro has collaborated with the University Mediterranean and the University Donja Gorica in the development of the **Internationalisation Strategy for 2021-2026.**[30] It aims to promote the recognition of the Montenegrin R&I system while encouraging academic mobility, investment in research, and the acknowledgement of the role of HEIs for the country.[31]

Among the efforts towards **ERA Action 14:** *Bring Science closer to citizens,* Montenegro participates in the **Digital Agenda Observatory**.[32] More specifically, the project on **Civil Engagement in the Digital Agenda (ICEDA)** managed by the observatory, aims to bring civil society organisations close to science and technology.

2.2.2. Progress towards achieving ERA Priorities

With regard to progress towards **Sub-priority 2.1:** *Challenge-based ERA actions*, the only available indicator (and only for some years between 2011 and 2017) is ***OECD patents on environment technologies***. During this time, Montenegro did not show a consistent trend. In 2017 it had a value of 9.38, as observed in Figure 11 in Annex 1.

Sub-priority 2.3: *Synergies with sectorial policies and industrial policy in order to boost innovation ecosystems* is tackled through ***direct and indirect government support through R&D tax incentives as a percentage of GDP***. Its value in Montenegro in recent years is barely above zero (0.0009%) (Figure 12 in Annex 1).

With regard to progress towards **Sub-priority 2.4:** *An active citizen and societal engagement in R&I in all its dimensions*, the indicator ***research on social innovation*** for Montenegro remains at 0, except in 2012 when it got to 1.6 (Figure 13 in Annex 1).

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

2.3.1. State of play in the implementation of the ERA Actions

In relation to **ERA Action 16:** *Improve EU-wide access to excellence*, the country has been investing efforts into reaching out to its research diaspora and including them in R&I projects to promote excellence. Additional activities in international cooperation started in April 2022, with Montenegrin engagement with the **European network of leading national innovation agencies (TAFTIE)**.[33] In addition, to enhance its position at the international level, Montenegro has committed to the **New European Innovation Agenda** which aims to improve the process of the green transition and increase R&I adaptability in this regard.[34]

[30] Internationalisation Strategy 2021-2026. University of Montenegro. https://www.ucg.ac.me/skladiste/blog_19379/objava_128673/fajlovi/Internationalisation%20Strategy%20of%20UoM%202021-2026_1_.pdf
[31] Ibid
[32] Increasing civil engagement in the digital agenda. https://ega.ee/project/increasing-civic-engagement-digital-agenda-iceda/
[33] European network of leading national innovation agencies (TAFTIE). https://taftie.eu/
[34] New European Innovation Agenda. https://research-and-innovation.ec.europa.eu/strategy/support-policy-making/shaping-eu-research-and-innovation-policy/new-european-innovation-agenda_en

2.3.2. Progress towards achieving ERA Priorities

In relation to progress towards **Sub-priority 3.1:** *More investments and reforms in countries and regions with lower R&I performance*, the relevant indicator ***is the increase (in percentage points) of total R&D expenditure expressed as a percentage of GDP.*** After several years of stagnation, Montenegro has managed to increase its gross spending on R&D to 0.50% of GDP in 2018. However, the level remained the same in all subsequent years until 2021 (Figure 14 in Annex 1).

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

2.4.1. State of play in the implementation of the ERA Actions

The **Collaborative Grants Programme implemented by the Innovation Fund** supports the cooperation of micro-enterprises and SMEs with scientific research institutions and other companies on commercially oriented innovative projects.[35] The private sector reduces some of the gaps created by the overall low level of R&D spending, which may indicate that an increase in public sector investments could also create crowding-in effects and synergies in science-industry collaboration. In this context, increased funding for R&I creates positive externalities, including increased participation in **Horizon Europe**.[36]

Moreover, in relation to **ERA Action 19:** *Establish an ERA monitoring system,* the **Statistical Office of Montenegro (MONSTAT)** is recognised by both the public and private sectors as the official monitoring mechanism in terms of data of the country.[37] It collects, analyses and disseminates the information on different fields such as the innovation activities of enterprises while being aligned with European bodies like Eurostat.

2.4.2. Progress towards achieving ERA Priorities

Within **Sub-priority 4.1:** *Coordination of R&I investments*, the key indicator is the ***share of public R&D expenditures financed by the private sector*** (Figure 15 in Annex 1). The share of R&D expenditure by the private sector was relatively high until 2013, but it decreased between 2014-2016. Since then, it has grown slightly until 2020, which should be put in the context of very low gross R&D expenditures in Montenegro.

3. Country-specific drivers and barriers

Montenegro is a candidate country for EU membership, building cooperation with EU institutions in various areas, including research and innovation. Montenegro became a fully associated to Horizon Europe in January 2021.

Montenegro has implemented new reforms for the efficient development of the R&I system. In January 2023, a coordination body was set up at the management level in the Ministry of Economic Development and Tourism to ensure consistency of the industrial policy with other national strategies and programmes. The advancement of Montenegro towards the ERA

[35] Programmes by the Innovation Fund. The collaboration grants. https://fondzainovacije.me/en/programs/
[36] Research and Innovation in Montenegro. European Commission. https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/europe-world/international-cooperation/association-horizon-europe/montenegro_en
[37] MONSTAT. https://www.monstat.org/eng/page.php?id=1800&pageid=1800

policy objectives will primarily be determined by its **capacity to prioritise R&I** within the policy agenda, mobilise resources, and reform its R&I system. As mentioned above, higher public sector R&I investments could lead to crowding-in effects and synergies in science-industry collaboration.

Furthermore, adopting key strategies and laws, setting up the **Innovation Fund**, and increasing international cooperation within ERA are important steps in that direction. International development actors could provide additional assistance for capacity building and increase the available resources.[38] Through the involvement in programmes such as **Horizon Europe**, the country can improve its position on ERA while boosting innovation, gender inclusion and international competitiveness.[39]

Government commitment to R&I investments and reforms may be a prerequisite for tangible advancements towards ERA. Its progress in R&I seems slowed down due to the **lack of resources and a long period of political instability**.[40] The European Innovation Scoreboard 2023 identified both the **government support for business R&D and R&D expenditures** in the business sector as relative weaknesses of the R&I system. The low level of investment in research, development and innovation signifies not only the lack of resources but also a weak political commitment to R&I as a driver of competitiveness and economic growth.[41]

4. Final remarks

Despite not having committed to the ERA Policy Agenda actions, Montenegro has developed and is implementing strategies and policies that contribute to ERA Policy Agenda implementation. It is primarily related to the adoption of the Strategy for Scientific Research Activities and the implementation of the Smart Specialisation Strategy, which strengthen the academia-business cooperation and support knowledge transfer between them.[42]

Regarding Montenegro's progress against the ERA indicators, the country has experienced fluctuations in the indicators under ERA Priority 1. In terms of ERA Priority 2 and ERA Priority 3, the data registered by Montenegro has stagnated during the last few years. Finally, the country shows a decreasing trend for the indicator under ERA Priority 4.

Montenegro improved the research, development and innovation system and integrated the ERA Priorities in the draft for the national strategy for research activities (2023-2027). In addition, the R&I sector in Montenegro demonstrates that different government services and ministries can work together, encouraged by the Smart Specialisation (S3) development efforts.[43] Finally, to monitor progress and benchmark Montenegro's performance in R&I, it is necessary to systematically collect the relevant data and address the current gaps in that area.

---

[38] Jahić, E. (2023). Montenegro's ERA integration: An update by POLICY ANSWERS. https://wbc-rti.info/object/document/24666/attach/20231117_ERA_MNE.pdf
[39] Ibid
[40] Ibid
[41] European Commission (2023a). Commission staff working document: 2023 Country Report – Montenegro. SWD(2022) 694 final. Brussels: European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/system/files/2023-11/SWD_2023_694%20Montenegro%20report.pdf
[42] Ibid
[43] Smart Specialisation. https://ec.europa.eu/regional_policy/policy/communities-and-networks/s3-community-of-practice/s3_forum_en

5. Bibliography

European Commission (2022). Commission staff working document: 2022 Country Report – Montenegro. SWD(2022) 335 final. Brussels: European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/system/files/2022-10/Montenegro%20Report%202022.pdf

European Commission (2023). European Innovation Scoreboard 2023 – Country profile Montenegro. Brussels: European Commission, available at: https://ec.europa.eu/assets/rtd/eis/2023/ec_rtd_eis-country-profile-me.pdf

European Commission (2023a). Commission staff working document: 2023 Country Report – Montenegro. SWD(2022) 694 final. Brussels: European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/system/files/2023-11/SWD_2023_694%20Montenegro%20report.pdf

Government of Montenegro (2019). Smart Specialisation Strategy of Montenegro 2019 – 2024 (*Strategija pametne specijalizacije Crne Gore 2019. – 2024.*). Podgorica: Government of Montenegro, available at: https://www.gov.me/dokumenta/18205a91-1afc-4eb7-a5cb-8ad5bd0b7712

Government of Montenegro (2023). Strategy for Micro, Small and Medium-Sized Enterprises Development in Montenegro 2023 – 2026. (*Strategija za razvoj mikro, malih i srednjih preduzeća u Crnoj Gori 2023. – 2026.*). Podgorica: Government of Montenegro, available at: https://www.gov.me/dokumenta/c8dc72b1-c63b-4e72-8e15-71f9de8f8d21

Government of Montenegro (2023a). Intellectual Property Strategy of Montenegro for the Period 2023 – 2026 with Action Plan for 2023 (Predlog *Strategije intelektualne svojine Crne Gore za period 2023 – 2026 sa predlogom akcionog plana za 2023. godinu*). Podgorica: Government of Montenegro, available at: https://www.gov.me/dokumenta/d8e61ee3-f669-41b7-b168-4b1c0846dd8f

Jahić, E. (2023). Montenegro's ERA integration: An update by POLICY ANSWERS, available at: https://wbc-rti.info/object/document/24666/attach/20231117_ERA_MNE.pdf

Law on Scientific Research Activity (*Zakon o naučnoistraživačkoj djelatnosti*), Službeni list Crne Gore 080/10 (31 December 2010), 040/11 (8 August 2011), 057/14 (26 December 2014), 082/20 (6 August 2020, available at: https://www.gov.me/dokumenta/1e14d5db-4a2a-4298-9bfc-3c93d771e411

Law on Innovation Activity (*Zakon o inovacionoj djelatnosti*), Službeni list Crne Gore 82/20 (6 August 2020, available at: https://www.gov.me/dokumenta/1ca533e1-4967-4728-9c13-d85f04945c49

Law on Incentive Measures for the Development of Research and Innovation (*Zakon o podsticajnim mjerama za razvoj istraživanja i inovacija*), Službeni list Crne Gore 82/20 (6 August 2020), available at: https://www.gov.me/dokumenta/3a639a2d-b37c-4ffd-89c6-9776a055dd22

Ministry of Education (2020). Programme for the Implementation of Open Science Principles with the Action Plan (2020 - 2022) (*Program ostvarivanja principa "Otvorena nauka" u Crnoj*

Gori s akcionim planom (2020 - 2022)). Podgorica: Ministry of Education, available at: https://www.gov.me/dokumenta/4314c441-9ba1-48a4-a398-d49b50ad2cd0

Ministry of Education (2023). Strategy of Higher Education Development of Montenegro for the period 2023 – 2026 (*Strategija razvoja visokog obrazovanja Crne Gore za period 2023. – 2026.*). Draft for public consultation. Podgorica: Ministry of Education, available at: https://www.gov.me/dokumenta/07b71445-67dd-41a7-9327-0dfafa8b5844

Ministry of Science and Technology Development (2023). Innovation Programme 2023 - 2027 (*Program za inovacije 2023 – 2027*). Podgorica: Ministry of Science and Technology Development, available at: https://www.gov.me/dokumenta/efca9f6a-618f-4fb5-b1fd-1d9d1e83264f

Tataj, D., Könnölä, T., Bole, D. and Dalle, J.-M. (2019). Towards Entrepreneurial Innovation Ecosystem. Independent expert report. Horizon 2020 Policy Support Facility. Luxembourg: Publications Office of the European Union.

6. Annexes

6.1. Annex 1: Graphs

The 2023 ERA Scoreboard and ERA Dashboard indicators used in the country report are presented in this annex. Detailed information on the data sources, description of the indicators, time period for which the data is available, and the necessary calculations can be found in the ERA Scoreboard and ERA Dashboard Methodology Report. The most recent data available for each indicator has been used.

General Indicators

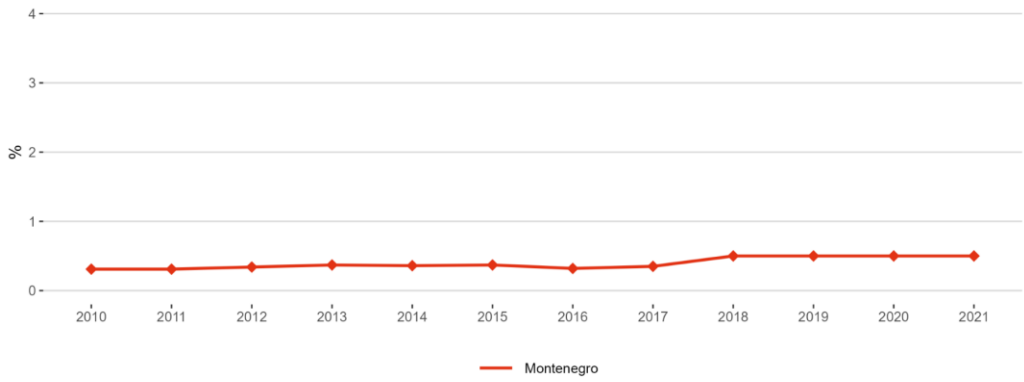


Figure 1: Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP

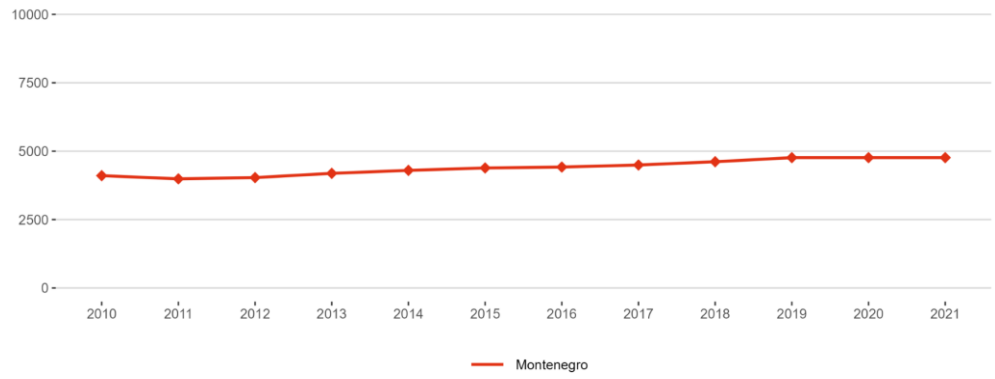


Figure 2: Researchers (in full-time equivalent) per million inhabitants

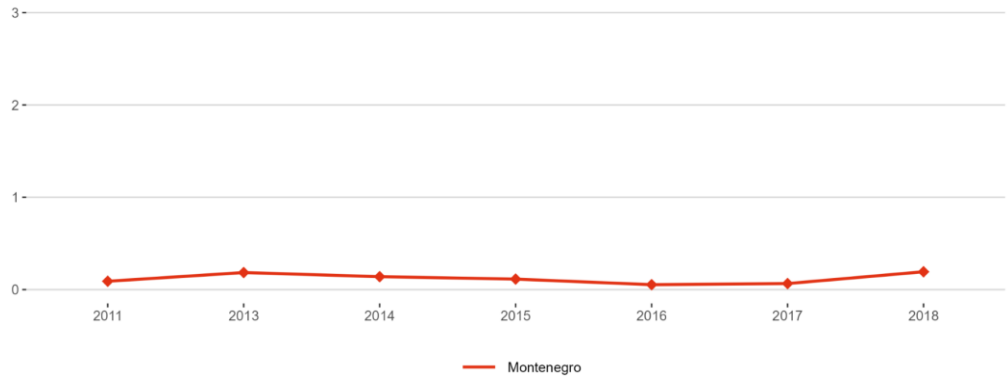


Figure 3: Business Enterprise expenditure on R&D (BERD) as a percentage of GDP

Priority 1: Deepening a truly functioning internal market for knowledge

Sub-priority 1.1: Open Science

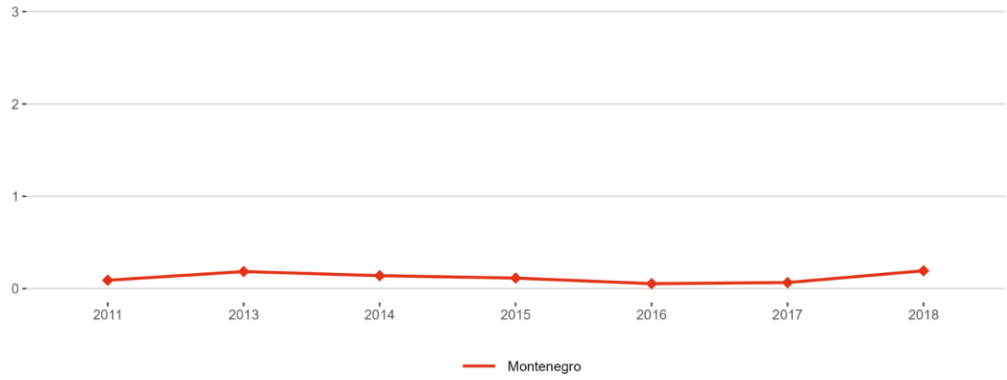


Figure 4: Share of publications available in open acces

Sub-priority 1.3: Gender equality, equal opportunities for all and inclusiveness

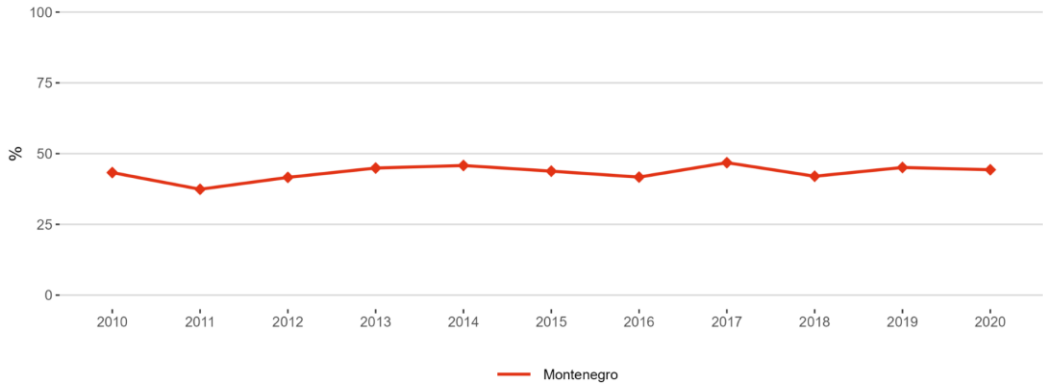


Figure 5: Proportion of papers with mixed gender authorship, 2000–2020

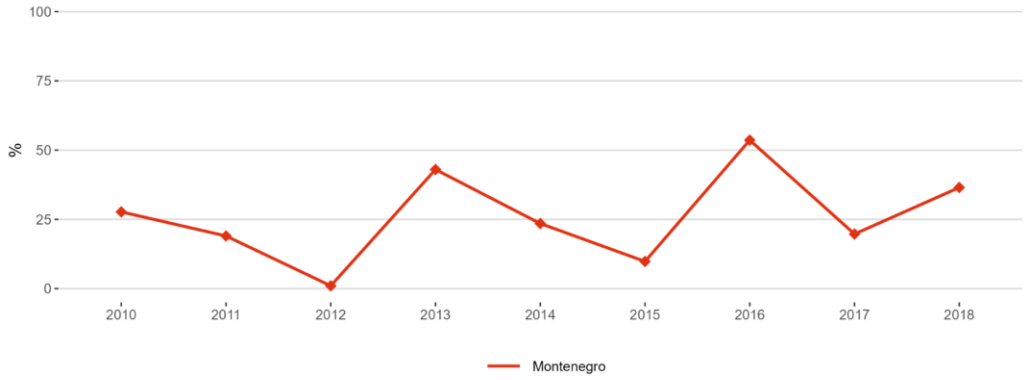


Figure 6: Proportion of women in authorships of the top 10% most cited publications, 2000–2018

Sub-priority 1.4: Researchers' careers and mobility and research assessment and reward systems

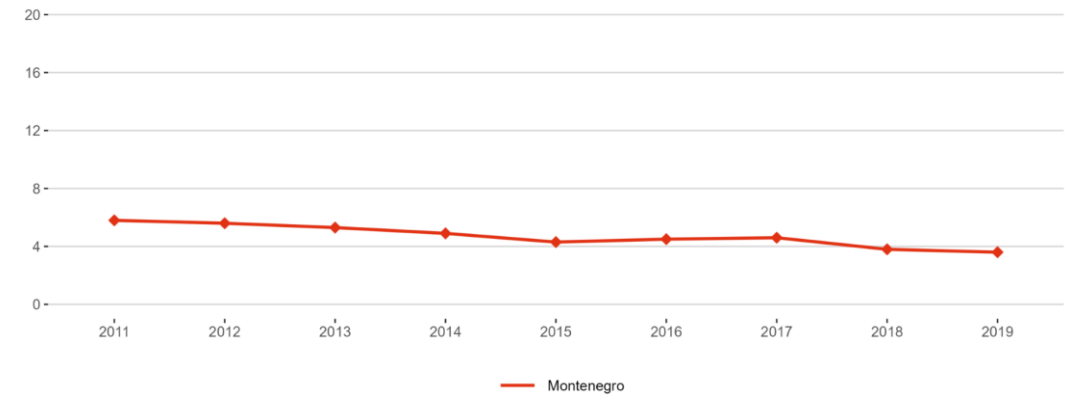


Figure 7: Job-to-job mobility of Human Resources in Science and Technology

Sub-priority 1.6: Scientific leadership

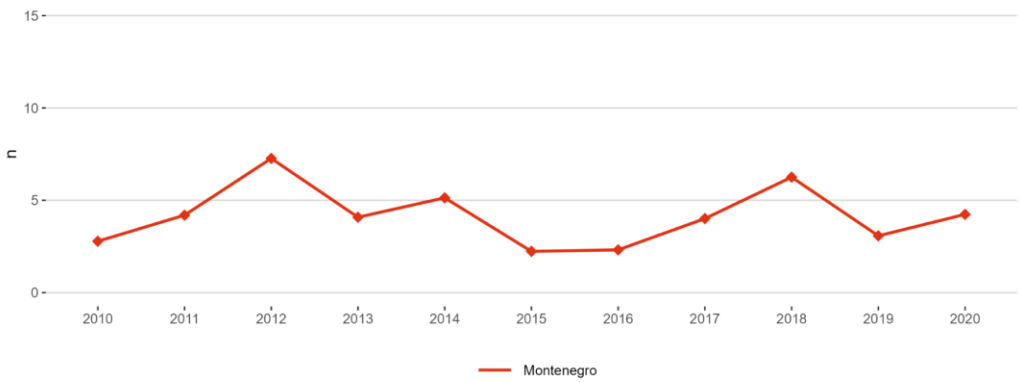


Figure 8: Number of scientific publications among the top-10% most cited publications worldwide as a percentage of all publications

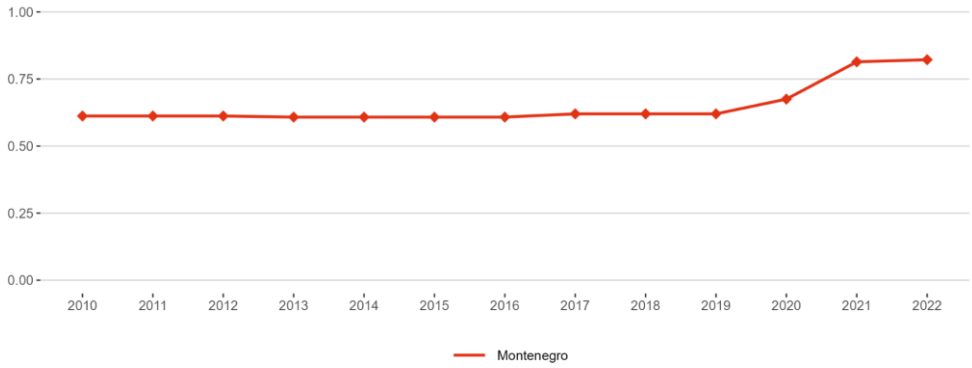


Figure 9: Academic Freedom Index (AFi)

Sub-priority 1.7: Global engagement

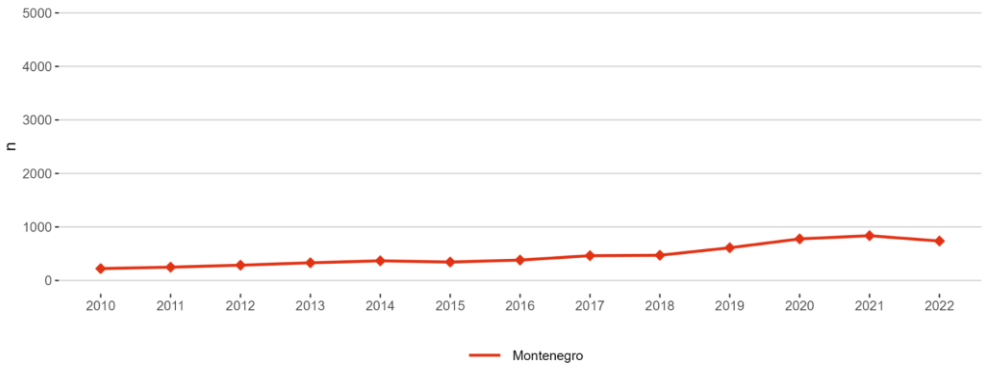


Figure 10: International co-publications with non-EU partners per 1,000 researchers in the public sector

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

Sub-priority 2.1: Challenge-based ERA actions

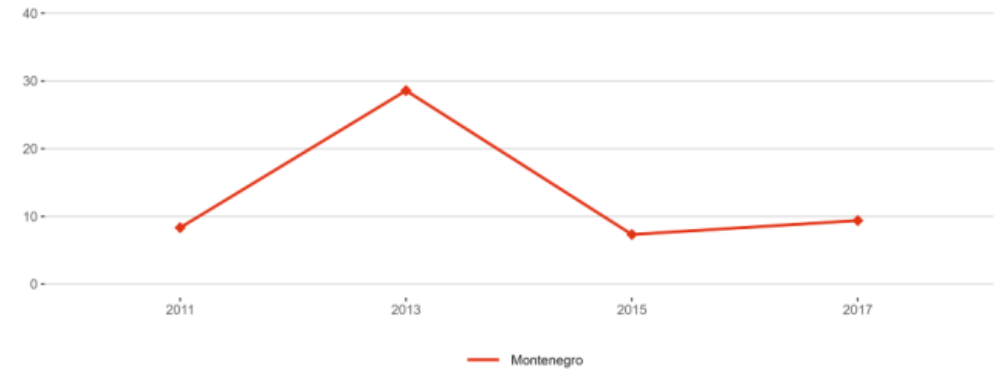


Figure 11: Patents on environment technologies

Sub-priority 2.3: Synergies with sectorial policies and industrial policy, in order to boost innovation ecosystems

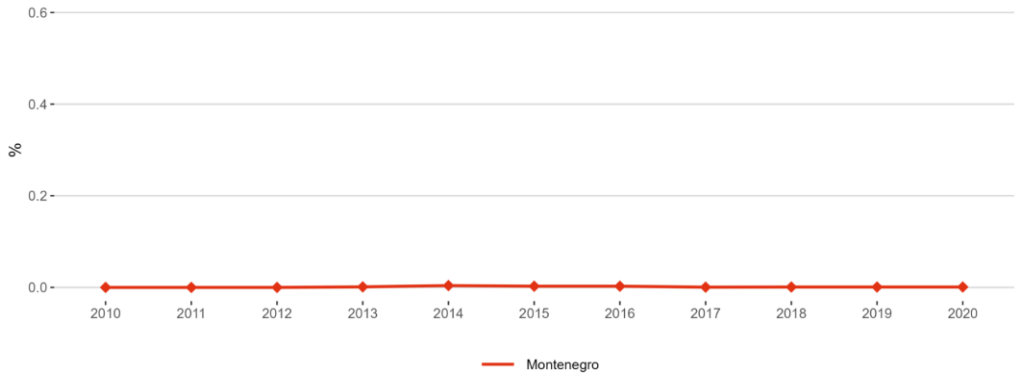


Figure 12: Direct government support and Indirect government support through R&D tax incentives as a percentage of GDP

Sub-priority 2.4: An active citizen and societal engagement in R&I in all its dimensions

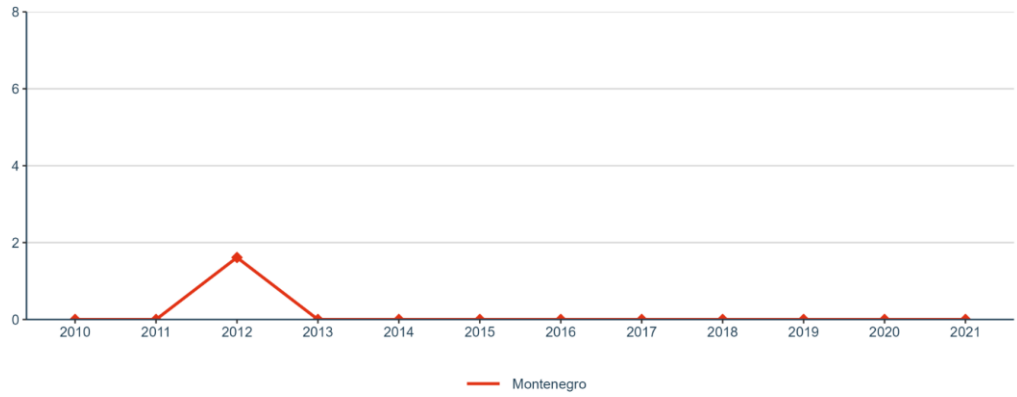


Figure 13: Research on social innovation (publications on 'social innovation' or 'social entrepreneurship') per million population

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

Sub-priority 3.1: More investments and reforms in countries and regions with lower R&I performance

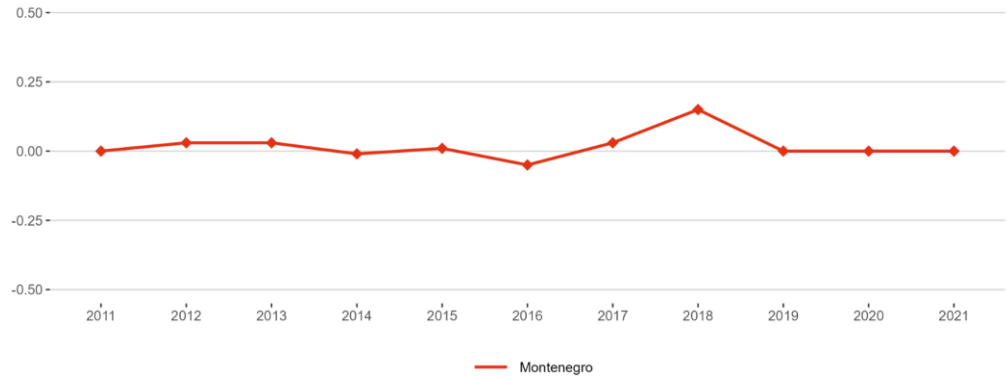


Figure 14: Increase (in percentage points) of total R&D expenditure expressed as a percentage of GDP

Priority 4: Advancing concerted research and innovation investments and reforms

Sub-priority 4.1: Coordination of R&I investments

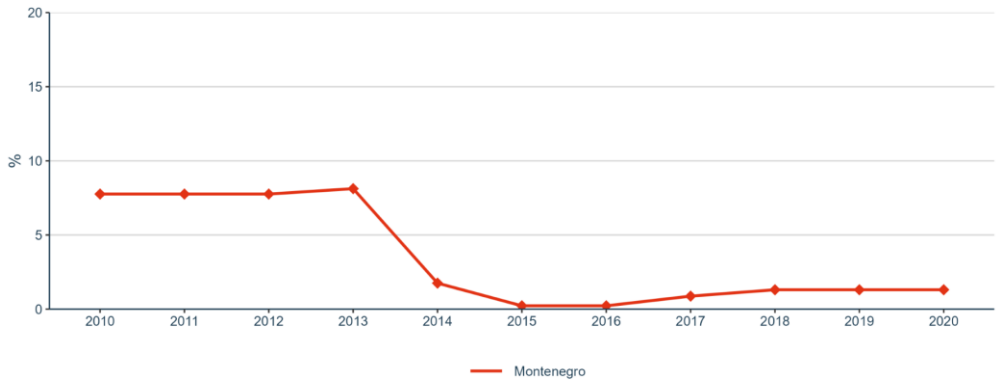


Figure 15: Share of public R&D expenditures financed by the private sector

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online (european-union.europa.eu/contact-eu/meet-us_en).

On the phone or in writing

Europe Direct is a service that answers your questions about the European Union.
You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696,
- via the following form: european-union.europa.eu/contact-eu/write-us_en.

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website (european-union.europa.eu).

EU publications

You can view or order EU publications at op.europa.eu/en/publications. Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre (european-union.europa.eu/contact-eu/meet-us_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex (eur-lex.europa.eu).

EU open data

The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

ERA Monitoring 2023: ERA Country Report Montenegro.

Research and Innovation policy