European Commission

ERA Country Report 2024
Italy

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Report

Research and Innovation

ERA Country Report 2024: Italy

European Commission
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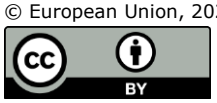

EUROPEAN COMMISSION

ERA Country Report 2024

Italy

This report was prepared by

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2025 Directorate-General for Research and Innovation EN

Table of contents

Key takeaways

- Italy is progressing towards ERA objectives through strategic R&I initiatives which align national priorities with ERA Actions, and recent reforms and NRRP investments have transformed these strategies into actionable initiatives advancing ERA objectives.

- In Open Science, Italy is taking concrete steps to operationalise the National Open Science Strategy (NPOS) by coordinating and mapping initiatives and bottlenecks, and by aligning NPOS actions with European initiatives such as the shared funding and use of the Open Research Europe Platform.

- Reforms strengthen the internal knowledge market through new laws on patent management and incentives for economic valorisation, while also fostering collaboration among universities, businesses, public administrations, and civil society; investments under NRRP further enhance research system attractiveness by retaining established researchers and attracting international talent, including MSC and ERC recipients, but long-term viability and attractiveness needs to materialise beyond 2026.

- Gender equality remains a priority, and Italy continues to make efforts to reduce disparities in academic and research careers. Moreover, steady progress can de confirmed in business R&D funding and industry-academia collaboration despite ongoing challenges.

1. National context

Italy is the 3rd largest EU Member State with a population of nearly 59 million people in 2024. Italy is categorised as a *moderate innovator* in the latest 2024 European Innovation Scoreboard[1]. In terms of expenditure on research, Italy performs below the EU average regarding Gross Domestic Expenditure on R&D (GERD), Government Budget Allocations for R&D (GBARD), and Business Enterprise expenditure on R&D (BERD). In particular, the relative low share of Business Enterprise expenditure on R&D as a percentage of GDP stands out, reaching only 0.83 percent in Italy, which is almost half of the EU average of 1.52 percent. On the other hand, Italy's share of female researchers is slightly above the EU average, standing at 34.28 percent compared to the EU's 33.71 percent.

Table 1 Structural Key Indicators

Indicator	EU27	Italy		
	2023	2023	Average 2018-2020	Average 2021-2023
GDP in current prices, euro per capita	35 790.00	33 840.00	29 653.33	31 033.33
Gross Domestic Expenditure on R&D (GERD) as a share of GDP	2.27	1.39	1.46	1.40
Government Budget Allocations for R&D (GBARD) as share of GDP	0.73	0.64	0.57	0.64
Business Enterprise expenditure on R&D (BERD) as a share of GDP	1.52	0.83	0.92	0.84
Expenditure on R&D procurement as a percentage of GDP	0.06	0.07	/	0.07
Size of the population (million)	448.80	59.00	59.80	59.09
Researchers (in FTE) per million inhabitants	4 681.34	2 826.05	2 620.64	2 778.53
Share of female researchers, all sectors of performance (%)	33.71	/	34.28	/

Source: see Annex 1

Italy has incorporated European Research Area (ERA) priorities into key national policies, such as the National Research Plan (NRP) 2021-2027 and the National Plan for Research Infrastructure (NPRI). More recently, the National Plan for Open Science, aligns with the ERA Policy Agenda also with a view on reinforcing European collaboration.

These efforts are supported by investments and reforms under the National Recovery and Resilience Plan (NRRP), which includes important public spending to improve the country's research and innovation (R&I) landscape. The NRRP includes measures addressing ERA Actions 1-14, focusing on strengthening the internal market for knowledge and tackling green and digital challenges. Investments in research infrastructure include EUR 1.5 billion to enhancing research infrastructures while fostering research-business collaboration. The NRRP also emphasises digital transformation, including the establishment of 11 NRRP Innovation Ecosystems, supported by EUR 1.25 billion, to facilitate regional innovation. In addition, five National Centres for Supply Chain Research has been funded under NRRP with EUR 1.6 billion. These centres, which continue to be consolidated, focus on five strategic areas: simulations, high-performance computing and data analysis; agritech; Gene therapy and drug development with RNA technology; sustainable mobility; and biodiversity. Furthermore, fourteen major Partnerships involving universities, research centres, and companies across Italy

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

have been financed with 1.61 billion euros to support basic research projects. These initiatives aim to strengthen national research chains and promote their participation in strategic European and global value chains. Through the Partnerships, public-private collaboration also extends around basic research-targeted at solving grand societal challenges. This collaborative model seeks to deliver innovative solutions, facilitate the direct application of research outcomes, and promote a new generation of researcher-inventors.

Beyond financial investments, reforms in the research landscape remain a priority, particularly in improving research careers and addressing brain drain. The New Strategy for the Internationalisation of Higher Education aims to support international mobility, strengthen skills development, and promote a more open research environment.

While the 2024 Italy Country Report notes progress in certain areas, it also highlights the need for further reforms and sustained investments, particularly in mobilizing funding for industrial research, technology transfer, and SME support.

2. Status of the Implementation of the ERA Policy Agenda

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

Italy has committed to 14 out of 20 ERA Actions, covering three out of the four Priority Areas (see Table 2). The national implementation of ERA Actions seeks to advance an open and fully functional internal knowledge market (ERA Actions 1-8), as outlined in the National Research Plan. Additionally, the NRRP includes key investments not only to deepen the internal knowledge market but also to address national challenges in the green and digital transition (ERA Actions 10-14). While the NRRP incorporates indicators to track research objectives, no dedicated national action plan or strategy exists to systematically monitor the advancement of the committed ERA Actions.

Table 2 Commitment to ERA Actions

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

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

[2] Documents consulted during the desk research include European Semester reports, the European Innovation Scoreboard, and reports from national ministries, such as the National Plan for Open Science or the ITA.CON report.

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

ERA Action 1) Enable the open sharing of knowledge and the re-use of research outputs, including through the development of the European Open Science Cloud (EOSC)

As a measure to improve national coordination, a Board of Experts was appointed to develop an Operational Plan for the National Plan for Open Science (NPOS) providing mapping of existing initiatives and gaps in the Open Science landscape in Italy and to identify 26 priority actions[3]. In November 2023, a national data stewards' community was set up under the Horizon Europe project "Skills4EOSC" to encourage collaboration between research and data stewards, raising awareness of the role of data stewards in research institutions[4]. Italy has taken steps to expand its international engagement in Open Science. The Ministry of University and Research (MUR) supported the Open Research Europe (ORE) Statement of Intent, signalling a commitment to participating in the shared funding and exploitation of the Open Research Europe Platform[5]. Additionally, a proposal for an EOSC National Node was submitted, aiming to enhance national coordination within the European Open Science Cloud framework.

ERA Action 2) Propose an EU copyright and data legislative and regulatory framework fit for research

A new law was introduced to strengthen Italy's intellectual property and research framework. Law No. 102/2023 amended the Industrial Property Code (IPC) (Legislative Decree No. 30/2005), redefining the ownership of inventions made within universities and research institutions. The reform, through the amendment of Article 65 IPC, transferred ownership rights of patentable inventions from individual researchers to their affiliated universities, public research institutions, or IRCCS, abolishing the "Professor's Privilege." In addition, the Patents+ 2024 measure was launched to boost patent strategy development and enhance the competitiveness of micro, small, and medium-sized enterprises (SMEs).[6]

ERA Action 3) Advance towards the reform of the Assessment System for research, researchers and institutions to improve their quality, performance and impact

Italy continues to make progress in ERA Action 3. On 1 August 2023, the Ministry of University and Research (MUR) issued Ministerial Decree 998, establishing the Guidelines for the Evaluation of Research Quality (VQR) 2020-2024, aimed at refining research assessment practices[7]. ANVUR issued the VQR 2020-2024 call on October 31, 2023, outlining evaluation procedures and timelines. For the first time, the assessment includes International Competitive Projects and Institutional Research (IRs) on a voluntary basis[8]. Additionally, on 21 December 2023, the ANVUR Board of Directors revised the Regulations for the Classification of Journals to align with the evolving landscape of scientific publishing, emphasizing ethical standards, transparency, and the responsible use of bibliometric indicators[9].

[3] https://open-science.it/en/article?rpk=290245
[4] Research Data Stewardship
[5] https://open-science.it/en/article?rpk=333456&prs_sel=p_institution&tpc_sel=t_openscience
[6] https://www.mimit.gov.it/it/incentivi/brevetti-2024
[7] https://www.mur.gov.it/sites/default/files/2023-08/Decreto%20Ministeriale%20n.%20998%20del%2001-08-2023.pdf
[8] https://www.unitn.it/en/research/quality-research/vqr-2020-2024
[9] https://www.anvur.it/attivita/classificazione-delle-riviste/classificazione-delle-riviste-ai-fini-dellabilitazione-scientifica-nazionale/regolamento-per-la-classificazione-delle-riviste-nelle-aree-non-bibliometriche/

ERA Action 4) Promote attractive and sustainable research careers, balanced talent circulation and international, transdisciplinary and inter-sectoral mobility across the ERA

In 2024, Italy ranks slightly below the EU average in research system attractiveness—due in part to a temporary decline in foreign doctorate students after 2017, a trend that is now reversing[10]. However, significant reforms and investments efforts have been implemented under NRRP to improve job stability in research careers and reverse brain drain. Key reforms include Ministerial Decree 637 (April 9, 2024), which allows universities and research institutions to directly recruit recipients of the MSCA Seal of Excellence and ERC grant winners as professors or researchers. Additionally, the Young Researchers 2024 – RRP (Decree 201 of July 3, 2024) allocates EUR 210 million to support at least 250 young researchers, prioritizing MSCA Individual Fellowship winners and Seal of Excellence recipients. Despite this progress, it remains important for Italy to take further measures to ensure the long-term sustainability and attractiveness of its research system beyond 2026.

ERA Action 5) Promote gender equality and foster inclusiveness, taking note of the Ljubljana declaration

Italy is advancing toward a systematic approach to gender equality in research and innovation. In line with the previous report, horizontal measures have been introduced to integrate gender equality provisions into both the NRP and the NRRP. A key initiative is the "Extended Partnerships", which supports collaboration between universities, research centres, and industry including gender balance requirement and funding conditions tied to the adoption of a Gender Budget and a Gender Equality Plan (GEP). The Statistical Office of MUR released the report "Women's Careers in Academia" (March 2024), while ANVUR published "The Focus of the ANVUR 2023 Report – Gender Analysis" (January 2024)[11], analysing gender data in research institutions and universities, highlighting disparities in academic and research careers.

ERA Action 6) Deepening the ERA through protecting academic freedom in Europe

The situation in Italy regarding academic freedom and institutional autonomy remains stable and within the top 10 percent worldwide[12]. Since the last report, three conferences on the protection of academic freedom have been organised in Genoa, Bari, and the National Research Council (CNR) in Rome.

ERA Action 7) Upgrade EU guidance for better knowledge valorisation

Recent advancements in knowledge valorisation have focused on structural A notable example is the reform of the Industrial Property Code, which redefines the ownership of inventions in favour of universities and public research institutions, shifting rights away from individual researchers.. Additional proposals for reforms have been supported through the Technical Support Instrument of DG REFORM. One key outcome of this support is the ITA.CON report, which proposes policy measures to strengthen knowledge exchange and collaboration between higher education institutions, businesses, and the public sector.

ERA Action 8) Strengthen sustainability, accessibility and resilience of research infrastructures in the ERA

The commitment to advancing this action is largely supported by the initiatives outlined in the latest report on research infrastructures in the NRRP, specially the 1.5 billion allocated in the plan via the Fund for the Creation of an Integrated System of Research and Innovation Infrastructure which encourages collaboration between research centres and the business sector to boost innovation. The “From Research to Business” – Simplification and Mobility Reform also makes it easier for skilled professionals to move between universities, research infrastructures, and companies. Italy keeps

[10] See European Innovation Scoreboard 2024 - Country Profile, Italy.
[11] I Focus del Raporto ANVER 2023 “Analisis di Genere”
[12] Kinzelbach, Lindberg, Pelke & Spannagel, 2023 and European Parliament Academic Freedom Monitor 2023

an active role European Research Infrastructure Consortia (ERIC)[13] and has presented its application to host the International Conference on Research Infrastructures (ICRI) 2026.

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

ERA Action 10) Make EU R&I missions (10.1) and partnerships (10.2) key contributors to the ERA

Since the previous report, Italy has joined the EU Mission "Restore our Ocean and Waters," strengthening its role in tackling global marine challenges as well as in the Mediterranean[14]. Additionally, recent regulatory reforms, including Ministerial Decree 1573 (9/9/24), have simplified national legislation for financing R&D projects under co-funded and international partnerships, enabling broader and more efficient participation in international projects and the use of European funds.

ERA Action 11) An ERA for green transformation

Since the last report, the Italian research agenda has increasingly focused on the green energy transition, emphasizing European collaborations, Italy plays an active role in European partnerships and the implementation of the SET Plan[15], notably participating in the Clean Energy Transition Partnership, committing EUR 8.2M (2022–2024) for collaborative R&I projects, and the Driving Urban Transitions Partnership, with EUR 6.6M for Positive Energy Districts[16]. Additionally, Italy collaborates with Germany on the pilot action for Green Hydrogen through a bilateral call for proposals, allocating EUR 1M to fund innovative research in hydrogen technology[17].

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

Building on the progress highlighted above, where Italy advanced the green transition through strong European partnerships, the NRRP also focuses on accelerating the digital transition. A key initiative is the creation of 11 NRRP Innovation Ecosystems, financed with EUR 1.25 billion, to enhance collaboration between research institutions and industry, facilitating knowledge and technology transfer. This directly addresses priorities outlined in the 2023 and 2024 European Semester Country Report for Italy, which stresses the importance of strengthening links between academia and the private sector to boost innovation and competitiveness.

ERA Action 13) Empower Higher Education Institutions to develop in line with the ERA, and in synergy with the European Education Area

Since the last report, Italy has taken important steps to empower its universities in the digital and green transition, aligning with the European Education Area. The New Strategy for the Internationalisation of Higher Education[18] strengthens the culture of internationalization, promotes mobility, and enhances skills development. Italy is investing to boost internationalization and academic mobility. EUR 87 million funds 30 projects for Art, Music, and Dance (AFAM) institutions to promote Italian culture abroad. The Young Researchers 2024 initiative allocates EUR 210 million to support 250 MSCA winners and Seal of Excellence researchers. 24 Transnational Educational Initiatives (TNE), in partnership with the Ministry of

[13] See the list of stablished ERIC over time (Italy hosts 3 out of 26 ERICs stablished across various European countries) in the Third Report on the Application of Council Regulation (EC) No 723/2009 of 25 June 2009 on the Community legal framework for a European Research Infrastructure Consortium (ERIC)
[14] https://research-and-innovation.ec.europa.eu/restore-our-ocean-and-waters/mission-restore-our-ocean-and-waters-2030-mediterranean-lighthouse-action-2023-05-30_en
[15] See SET Plan (European Strategic Energy Technology Plan)
[16] https://dutpartnership.eu/
[17] https://www.esteri.it/wp-content/uploads/2024/04/A_Call_Green_Hydrogen.pdf
[18] See the Decree MUR-MAECI no. 1122 of 01-08-2024

Foreign Affairs, aim to create permanent higher education centres abroad, funded with EUR 50 million, also dedicated to individual mobility for teachers and students, promoting global collaboration and exchanges. Additionally, the creation of three Digital Education Hubs (DEH), with an investment of EUR 60 million, will enhance the higher education system's capacity to offer digital education for students and university staff.

ERA Action 14) Bring Science closer to citizens

The activities foresee within the National Research Plan remain the main systemic approach to deploy activities to promote the engagement, trust and interest in science by citizens and local communities. Part of the actions to contribute to this ERA Action were disseminated during the Italian G7 Presidency 4-5 (cybersecurity).

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

Italy has not committed to an ERA Action under this priority area.

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

ERA Action 19) Establish an efficient and effective ERA monitoring mechanism

Based on interviews and desk research, no further work on this action was identified during the time period covered.

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 Italy'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 1-8** which aim to create structural reforms and other interventions. The implementation of these activities in largely on track and supported by dedicated investments.

ERA Dashboard Indicators 6 and 7 on the share of publications and datasets in open-access, show positive development along with the EU average. Also, ERA Dashboard Indicator 8 highlights that Italy is one of the countries with largest number of repositories but still with room for improvement. This trend reinforces Italy's concrete steps taken towards operationalising its **Open Science Policy,** as described in chapter 2. Another long-standing topic in the ERA and Italy's R&I system is **gender equality** where Italy plays a prominent role among EU countries. The related ERA Dashboard Indicators (13, 14, 16) are above the EU average, while ERA Dashboard Indicator 15, which shows the position of Italy in "Women in Digital Index", remains below the EU average despite having a positive trend over the last years.

As a result of the reforms and investments, particularly in research and innovation infrastructure in the NRRP, Italy allocates a significant share of its R&D public investments to

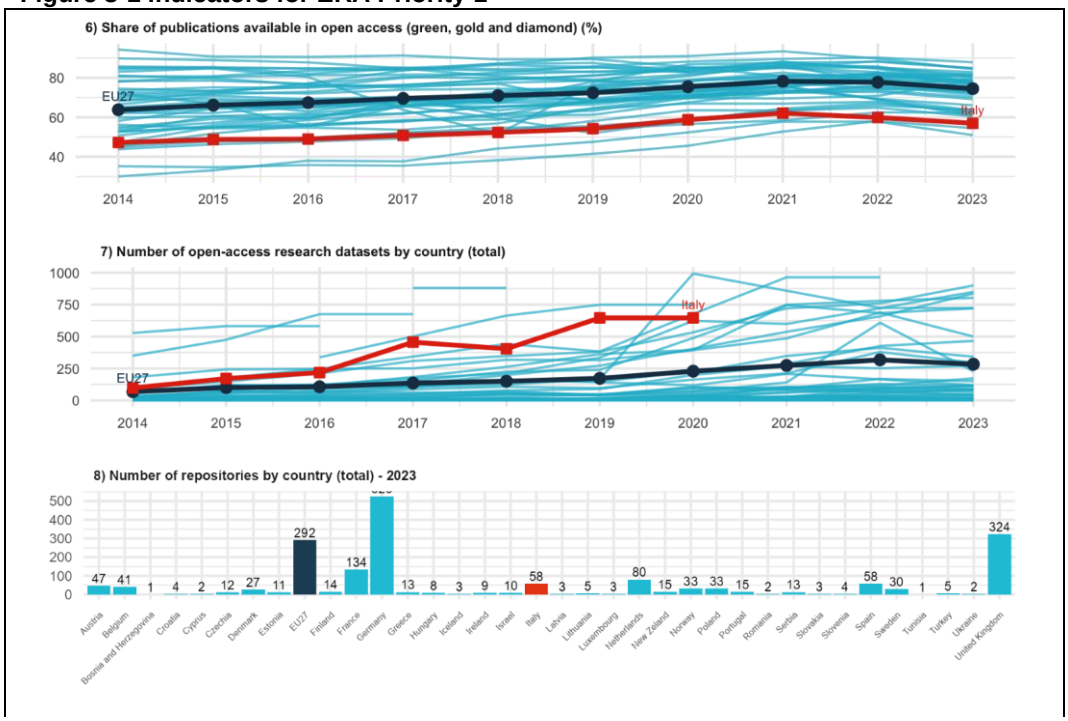
European research infrastructure as reflected in ERA Dashboard Indicator 10. Additionally, the country ranks among leading participants in these infrastructures in the EU (ERA Dashboard Indicator 11). The commitment to advancing this action is largely supported by the initiatives outlined in the latest report on research infrastructures in the NRRP.

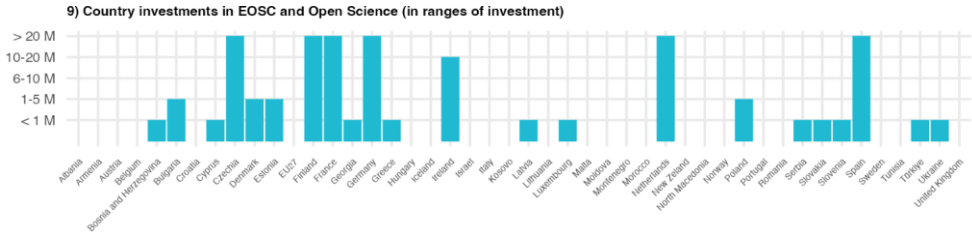
In the area of **talent attraction and sustainable research careers**, trends have remained relatively consistent in the share of doctorates within the country (ERA Dashboard Indicator 18). However, talent attraction remains at a slower pace despite recent reforms, with ERA Dashboard Indicator 17 showing limited progress despite recent reforms outlined in the section before. The impact of these reforms may take time to materialise, requiring further monitoring.

The commitment to ERA Action 7 in domain of **valorisation of knowledge shows** uneven progress. Italy performs above the EU27 average in intellectual property management (ERA Dashboard Indicator 25) and ranks highly in top-quality publications (ERA Dashboard Indicator 26). However, strengthening industry-academia collaboration is essential to leveraging knowledge assets for new market opportunities and emerging technologies. In this regard, ERA Dashboard Indicator 21 shows a declining trend, likely linked to insufficient business investment in R&D (BERD), a concern repeatedly highlighted in country report recommendations since 2019. Recent investments and initiatives described in the section before, both in ERA priority 1 and 2, may contribute positively to see some improvement in this indicator and fostering stronger industry-academia collaboration.

Other fields with positive developments include the 'Academic Freedom Index (AFI)' that is over the EU27 average (ERA Dashboard Indicator 27) and 'International co-publications with non-EU partners (ERA Dashboard Indicator 30).

Figure 3-1 Indicators for ERA Priority 1




9) Country investments in EOSC and Open Science (in ranges of investment)
> 20 M
10-20 M
6-10 M
1-5 M
< 1 M
Albania
Armenia
Austria
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kosovo
Latvia
Lithuania
Luxembourg
Malta
Moldova
Montenegro
Morocco
Netherlands
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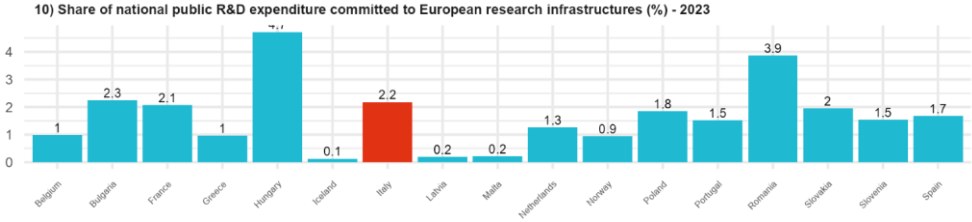
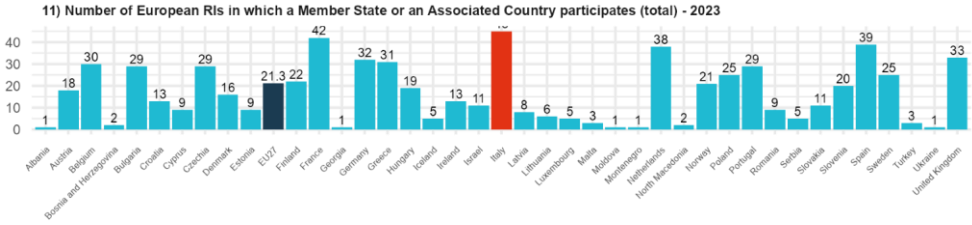
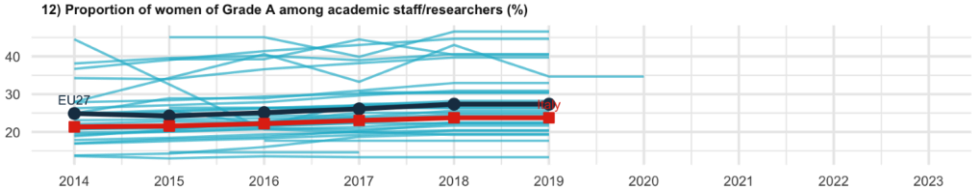
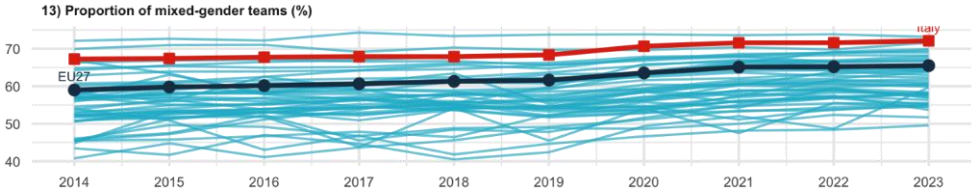
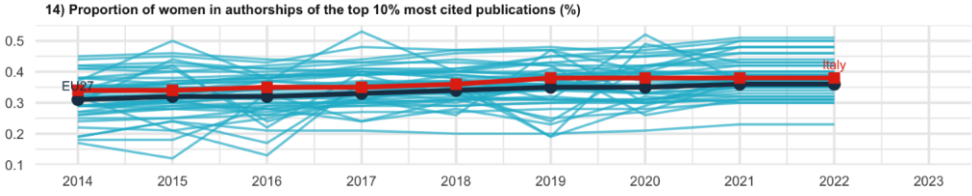
Slovenia
Spain
Sweden
Tunisia
Türkiye
Ukraine
United Kingdom

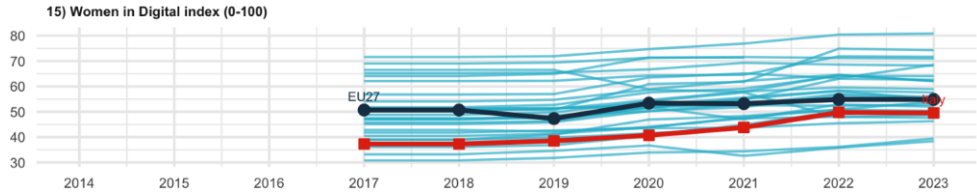

10) Share of national public R&D expenditure committed to European research infrastructures (%) - 2023
1
2.3
2.1
1
2.2
0.1
0.2
0.2
1.3
0.9
1.8
1.5
3.9
2
1.5
1.7
Belgium
Bulgaria
France
Greece
Hungary
Iceland
Italy
Latvia
Malta
Netherlands
Norway
Poland
Portugal
Romania
Slovakia
Slovenia
Spain

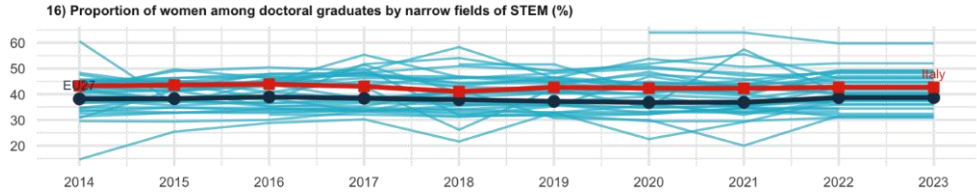

11) Number of European RIs in which a Member State or an Associated Country participates (total) - 2023
1
18
30
2
29
13
9
29
16
9
21.3
22
42
1
32
31
19
5
13
11
8
6
5
3
1
1
38
2
21
25
29
9
5
11
20
39
25
3
1
33
Albania
Austria
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
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

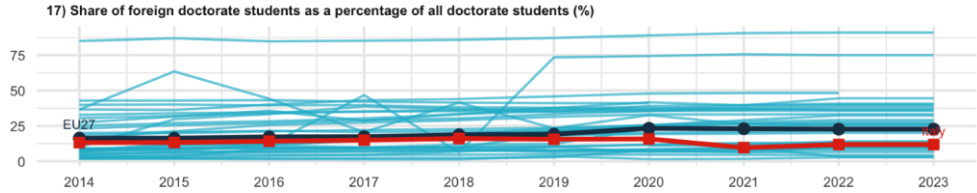

12) Proportion of women of Grade A among academic staff/researchers (%)
EU27
Italy

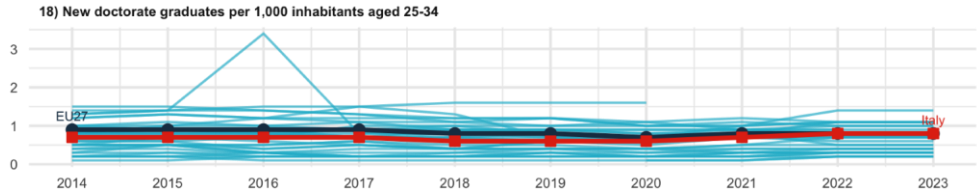

13) Proportion of mixed-gender teams (%)
EU27
Italy

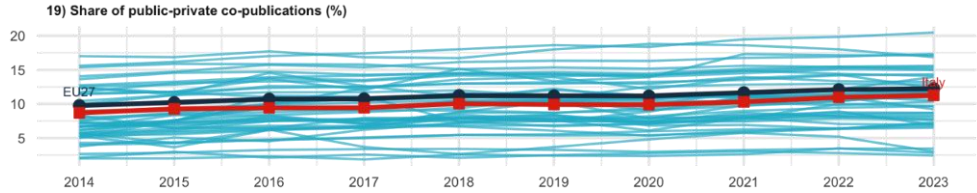

14) Proportion of women in authorships of the top 10% most cited publications (%)
EU27
Italy


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

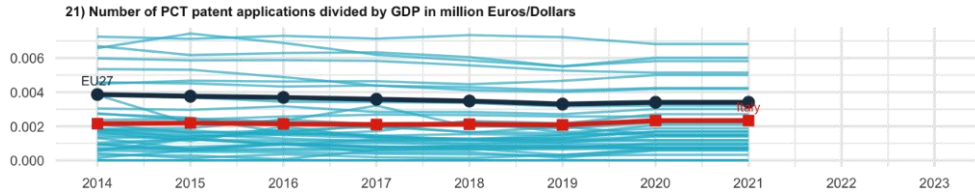

16) Proportion of women among doctoral graduates by narrow fields of STEM (%)
60
50
40
30
20
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

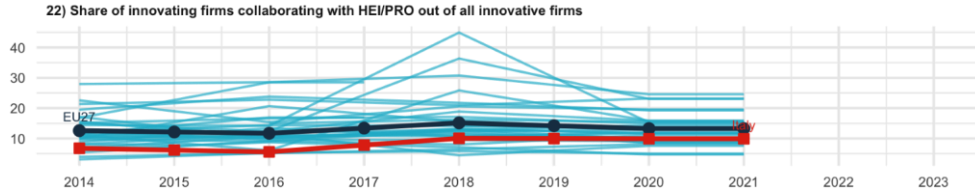

17) Share of foreign doctorate students as a percentage of all doctorate students (%)
75
50
25
0
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

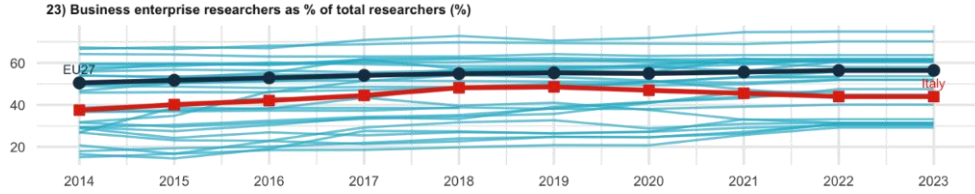

18) New doctorate graduates per 1,000 inhabitants aged 25-34
3
2
1
0
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

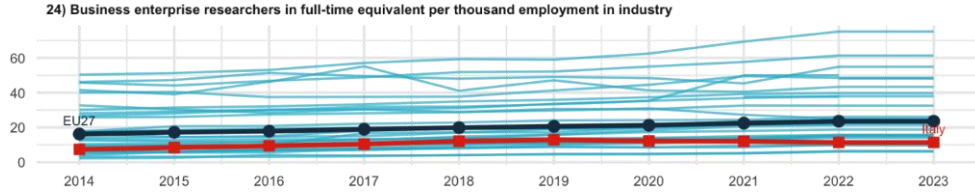

19) Share of public-private co-publications (%)
20
15
10
5
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

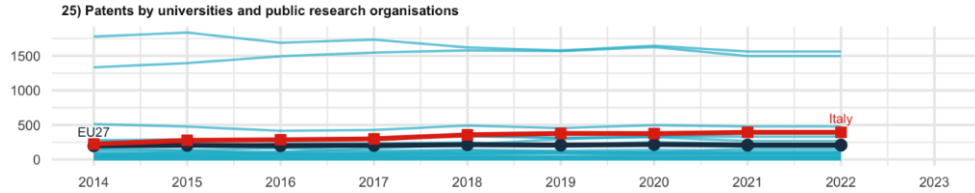

20) Best practice examples and methodologies for knowledge valorisation - 2023
30
20
10
0
10
25
2
2
6
4
1
7
9
11
2
1
7
13
3
4
3
1
21
1
11
1
1
1
6
13
6
6
Austria
Belgium
Croatia
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands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

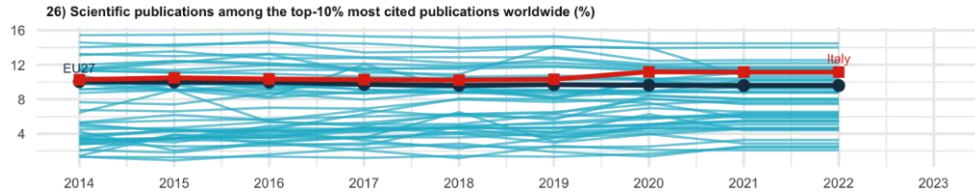

21) Number of PCT patent applications divided by GDP in million Euros/Dollars
0.006
0.004
0.002
0.000
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

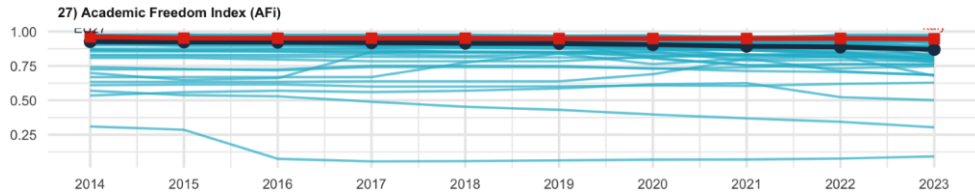

22) Share of innovating firms collaborating with HEI/PRO out of all innovative firms
40
30
20
10
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

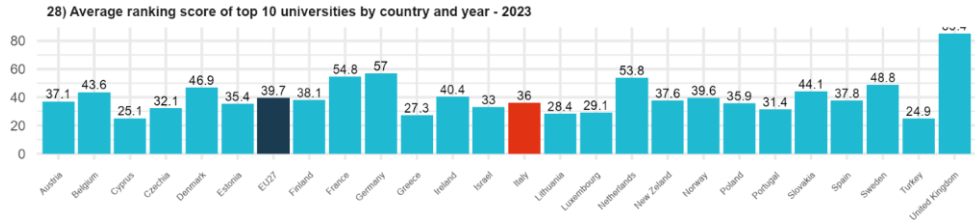

23) Business enterprise researchers as % of total researchers (%)
60
40
20
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

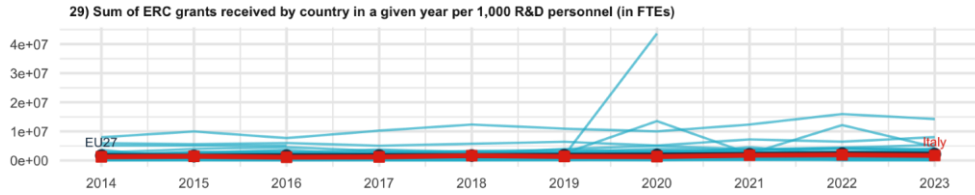

24) Business enterprise researchers in full-time equivalent per thousand employment in industry
60
40
20
0
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

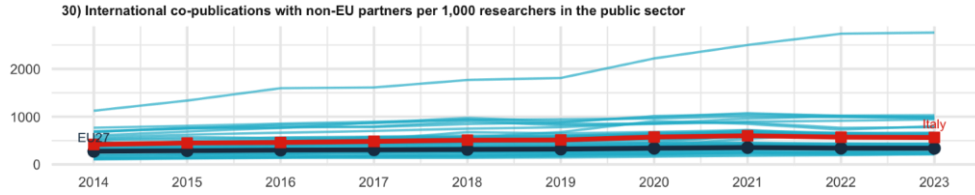

25) Patents by universities and public research organisations
1500
1000
500
0
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

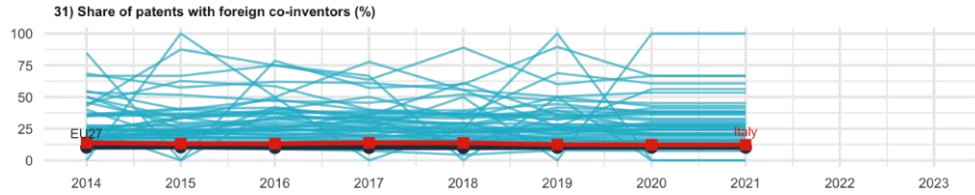

26) Scientific publications among the top-10% most cited publications worldwide (%)
16
12
8
4
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

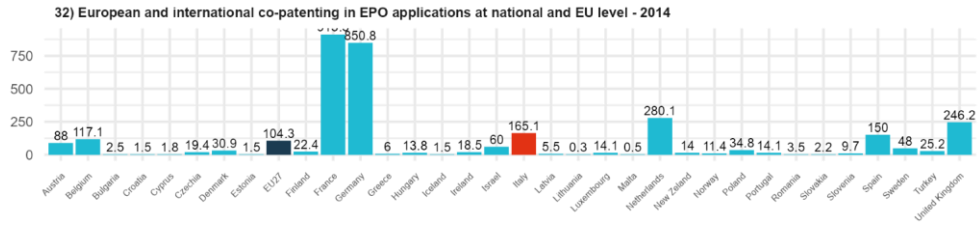

27) Academic Freedom Index (AFi)
1.00
0.75
0.50
0.25
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

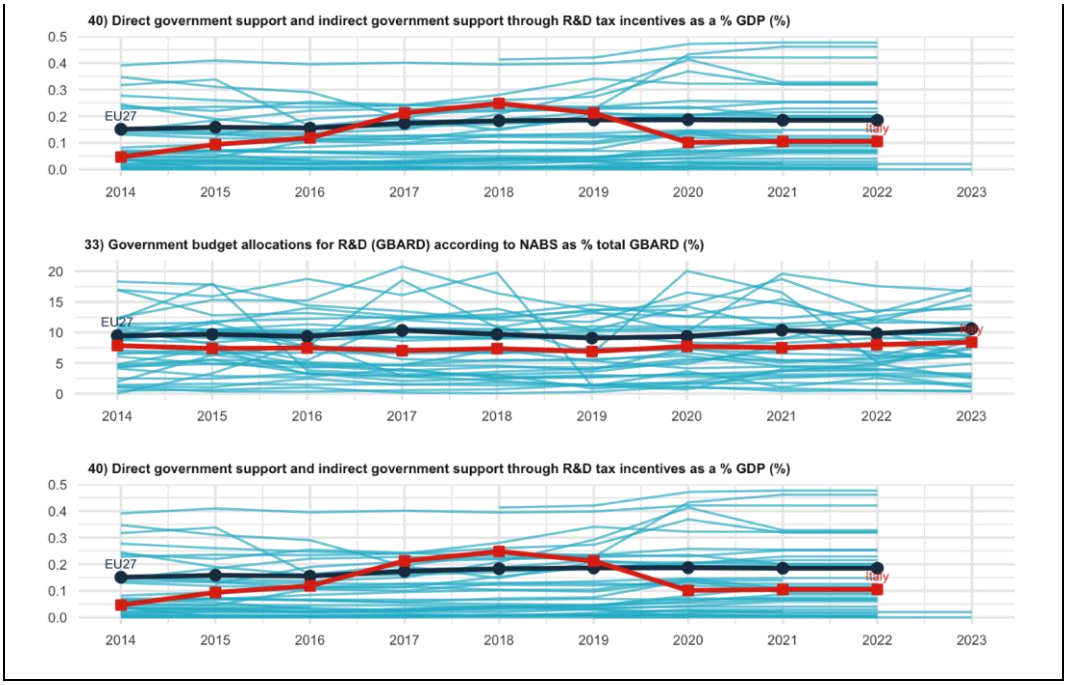

28) Average ranking score of top 10 universities by country and year - 2023
80
60
40
20
0
37.1
43.6
25.1
32.1
46.9
35.4
39.7
38.1
54.8
57
27.3
40.4
33
36
28.4
29.1
53.8
37.6
39.6
35.9
31.4
44.1
37.8
48.8
24.9
Austria
Belgium
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Germany
Greece
Ireland
Israel
Italy
Lithuania
Luxembourg
Netherlands
New Zealand
Norway
Poland
Portugal
Slovakia
Spain
Sweden
Turkey
United Kingdom


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
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


30) International co-publications with non-EU partners per 1,000 researchers in the public sector
2000
1000
0
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


31) Share of patents with foreign co-inventors (%)
100
75
50
25
0
EU27
Italy
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


32) European and international co-patenting in EPO applications at national and EU level - 2014
750
500
250
0
88
117.1
2.5
1.5
1.8
19.4
30.9
1.5
104.3
22.4
850.8
6
13.8
1.5
18.5
60
165.1
5.5
0.3
14.1
0.5
280.1
14
11.4
34.8
14.1
3.5
2.2
9.7
150
48
25.2
246.2
Austria
Belgium
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
New Zealand
Norway
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden
Turkey
United Kingdom



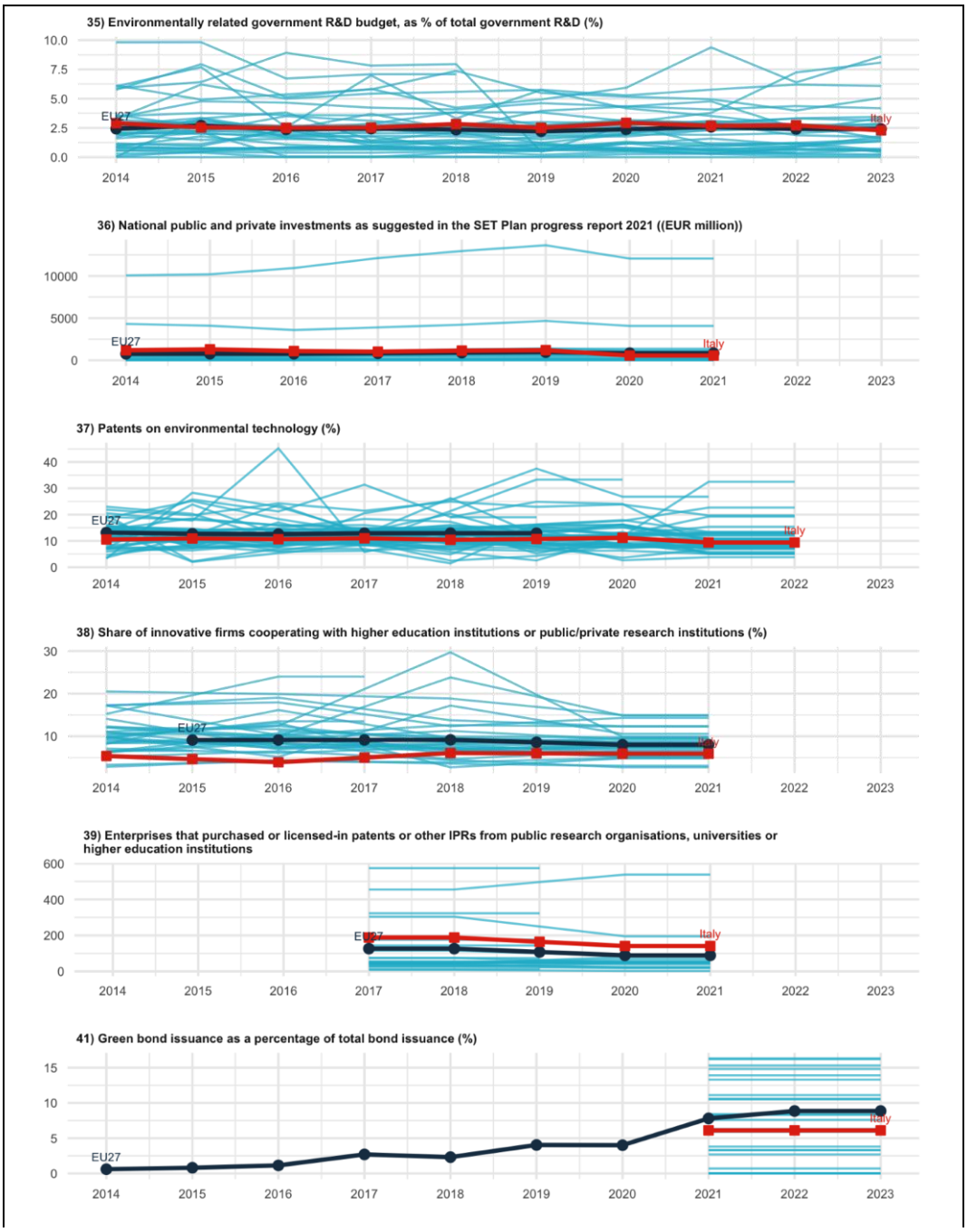
Source: Annex 1

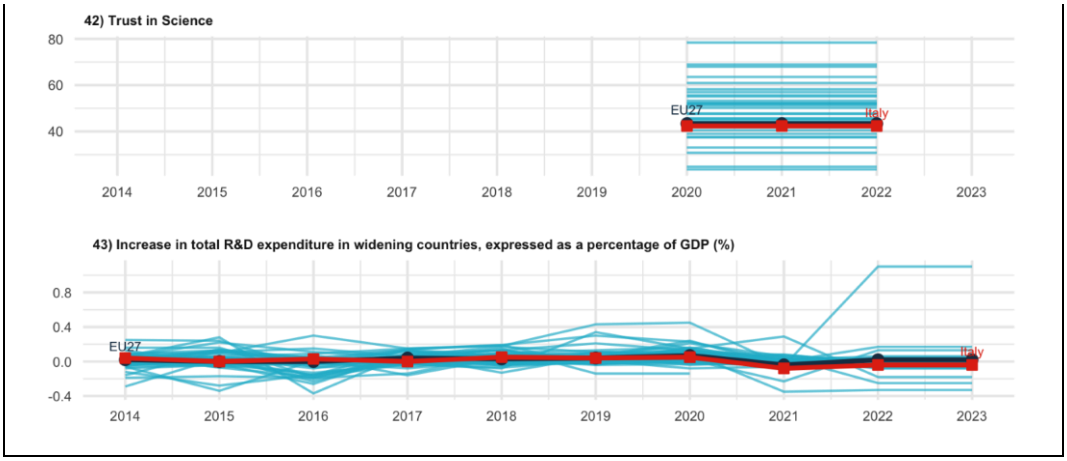
ERA Priority 2 is addressed by Italy through national initiatives across all ERA actions (Missions, Partnerships, Green Transformation, Industrial Ecosystem Transitions, and Science to Citizens), with many recently launched, including Italy's participation in the Missions to Ocean.

Challenge-based ERA action indicators show mixed results. Italy remains strongly committed to European partnerships, as evidenced by its high GBARD allocations to transnational, bilateral or multilateral R&D programs per FTE researcher in the public sector (ERA Dashboard Indicator 34). However, SET Plan contributions show a declining trend as of 2020 (ERA Dashboard Indicator 36), partly due to missing recent data, and the shift towards green energy transition and new investments are not in the data points. Overall, Italy's performance aligns with the EU average, with both maintaining stability rather than an increasing pace in these areas in line with the improvements outlined in ERA Action 10 and 11 which might be a result of increasing participation in international partnerships.

Regarding "Bring Science to Citizens," trust in science remains stable and aligns with the EU average (ERA Dashboard Indicator 42). The NRP 2021-2027 places special emphasis on engaging citizens in science and promoting Open Science practices and contributes to the progress in ERA Action 14. On the other hand, the increase in research investment in widening countries is very low (ERA Dashboard Indicator 43).

Figure 3-2 Indicators for ERA Priority 2

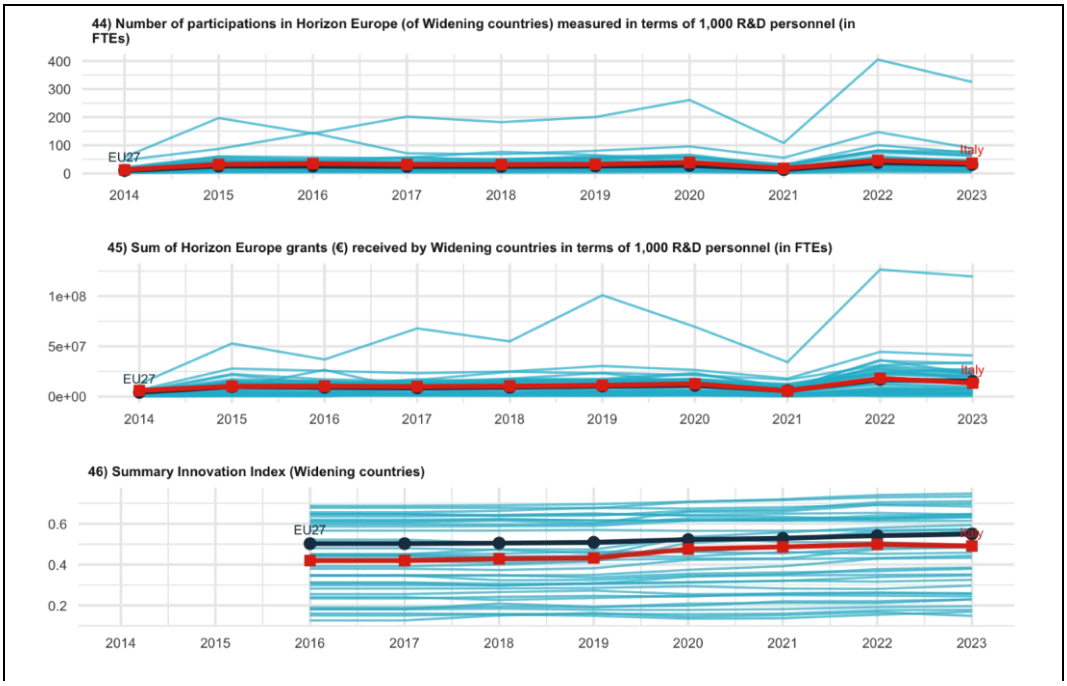


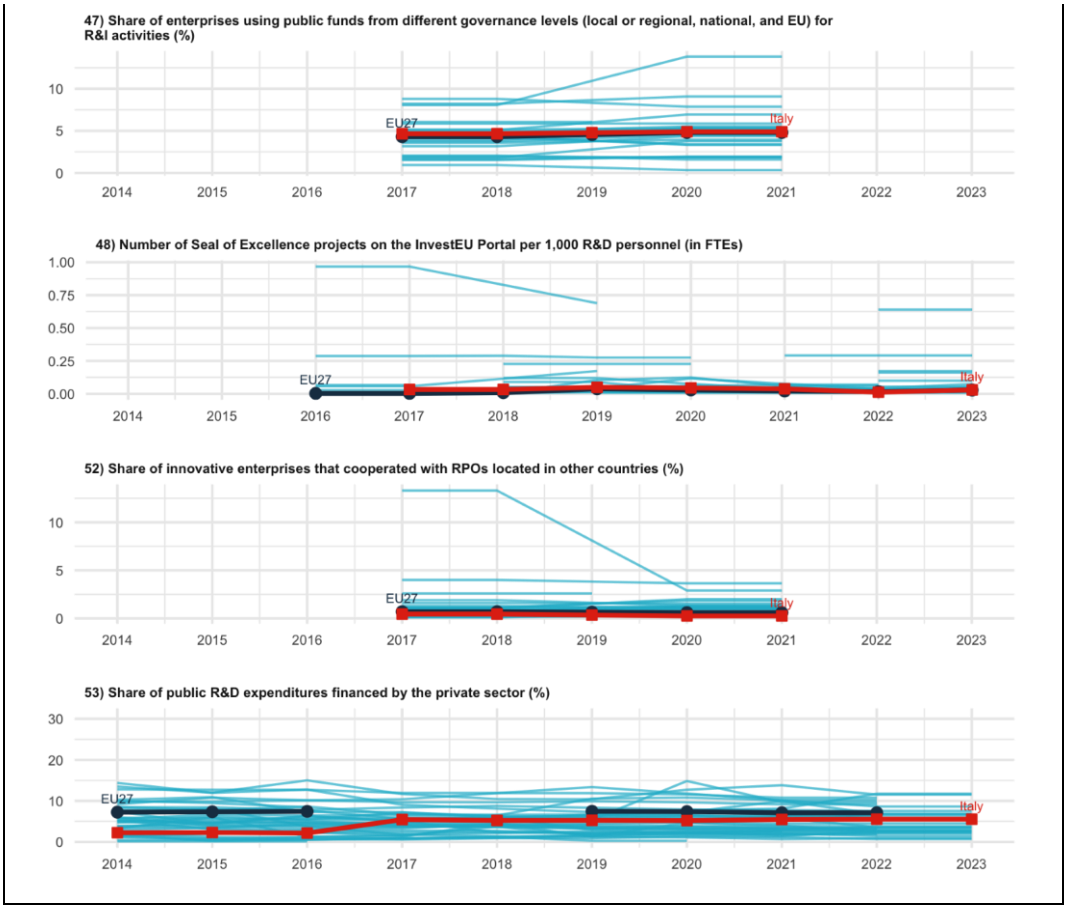


Source: Annex 1

Although Italy has not committed to any actions under ERA Priority 3, the performance of public research organisations and interlinkages between academia, business, and industry (ERA Dashboard Indicators 47, 52-53) show a trend like the EU average, remaining stable over time. Equally the participation in Horizon Europe remains close to EU average (ERA Dashboard Indicator 44).

Figure 3-3 Indicators for ERA Priority 3

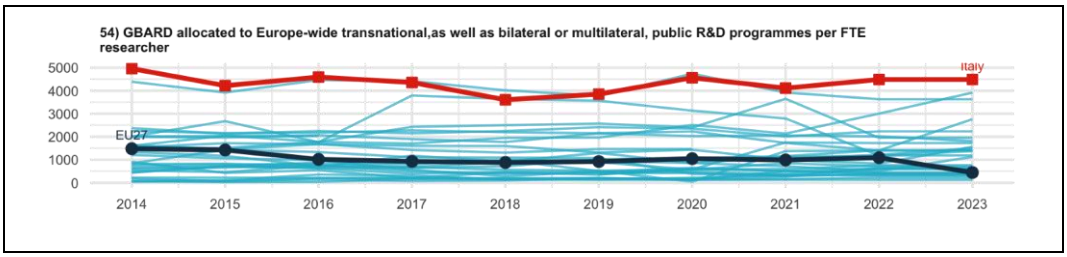




Source: Annex 1

ERA Priority 4 focuses on Action 19, aimed at establishing an efficient and effective ERA monitoring mechanism. The monitoring of ERA commitments is primarily integrated into the National Research Program (PNR) monitoring system, which includes an annual plan update. Additionally, the assessment of achievements will be conducted through the monitoring of results in the NRRP.

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 Italy and their effects on the national R&I system, including the quantitative performance in the ERA Dashboard. As stated previously Italy has incorporated the ERA Policy Agenda and the ERA priorities into national R&I priorities and strategies, such as the NRP 2021-2027, the NPRI, the NPOS creating an integrated framework for advancing research and innovation in line with European priorities.

The implementation of the national R&I strategies creates additional synergies with **ERA Priority 1**, the NPOS and the NPRI 2021-2027 both emphasise open access, the FAIR (Findable, Accessible, Interoperable, and Reusable) management of research outputs, and the modernization of research infrastructures. These objectives directly support ERA Actions 1 and 8.

Moreover, PNIR's emphasis on robust, interconnected research infrastructures dovetails with ERA Action 7 on enhancing EU guidance for knowledge valorisation. By strengthening Italian research centres' capacity to engage with industry and convert scientific outcomes into economic benefits, these measures reinforce the envisioned internal knowledge market. However, progress ERA Dashboard Indicator 23 related to researcher in the private sector has declined over time and remains below the EU average.

The NRP complements these efforts through its emphasis on enhancing research careers, gender equality, and interdisciplinary collaboration, objectives that align with ERA Actions 3, 4, and 5, which aim to reform research assessment systems, promote sustainable career structures, and ensure inclusiveness.

Italy's commitment to **ERA Priority 2** is evident in its twin focus on the green and digital transitions. The PNR and NRRP channel significant investments into innovation ecosystems that accelerate the digital and environmental transformations (ERA Actions 10-14). These initiatives foster collaborations that leverage cutting-edge technologies for energy transition, sustainable industrial ecosystems, and enhanced higher education, thus reinforcing Italy's role in driving Europe's twin transition.

While the national strategies strongly support these ERA commitments, a key area for further synergy lies in establishing a dedicated national monitoring mechanism for ERA Actions (**ERA Priority 4** and ERA Action 19). Such a system would ensure that the progress made through the integration of open science, robust research infrastructures, and targeted investments is systematically tracked and optimised, thereby reinforcing the overall ERA policy agenda.

5. Conclusions

Italy is identified as a moderate innovator according to the European Innovation Scoreboard, with a research landscape primarily driven by public institutions. Italy demonstrates **strong commitment** to the European Research Area (ERA) and its policy agenda. This commitment is embodied in the alignment of key national R&I strategies with European priorities and funding programmes. Recent **reforms and investments**, particularly under the NRRP, have transformed these strategies into actionable initiatives that accelerate progress toward ERA objectives.

In Open Science, Italy has coordinated and deployed NPOS **actions** alongside European initiatives – such as committing to the shared funding and exploitation of the Open Research Europe Platform – demonstrating its strong dedication to this ERA Action.

Recent reforms support ERA Actions to strengthen the internal knowledge market, including new guidelines to the evaluation or research quality (ERA Action 3) and investments to enhance research system attractiveness **by retaining established researchers and attracting international talent**, including MSC and ERC recipients (ERA Action 4). Moreover, further progress has been made through new laws to **improve patent management, and** reforms and initiatives for **knowledge valorisation**, aligned with ERA Action 5**.**

Gender equality remains a priority for Italy, which still faces disparities in academic and research careers despite performance above the EU average demonstrating its commitment to advancing in this area.

The ITA.con report by DG Reform proposes reforms aimed at **enhancing knowledge exchange and collaboration among higher education institutions, businesses, public administrations, and civil society**. These reforms if implemented might leverage investments under the NRRP that promote collaboration between research centres and the business sector, directly contributing to ERA Actions focused on knowledge valorisation and enhanced industry collaboration.

In challenge-oriented ERA Actions, Italy plays an active role in various initiatives (Missions, Partnerships, SET Plan) that address societal challenges and drive the green and digital transitions. Investments and pilot transnational projects focused on green energy and digital industrial ecosystems further reinforce this approach.

Analysis of relevant ERA Dashboard indicators suggests **that Italy is implementing specific measures in order to achieve ERA objectives**. While recent reforms and initiatives have been introduced, their impact may take time to materialise. Improvements are observed in open science, gender equality, and research infrastructure investment, and some results on business enterprise R&D funding and industry–academia collaboration are about to be observed after implementing specific measures. Despite the integration of **ERA commitments within national strategies**, overall **progress is expected.**

6. References

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Italian National Plan for Open Science: https://www.mur.gov.it/sites/default/files/2023-01/PNSA_2021-27_ENG.pdf

Piano Nazionale Infrastrutture di Ricerca (PNIR) 2021 – 2027: https://www.mur.gov.it/sites/default/files/2021-10/Decreto%20Ministeriale%20n.1082%20del%2010-09-2021%20-%20PNIR%202021%20-%202027.pdf

ANVUR Notice «Research Quality Assessment 2020-2024 (VQR 2020-2024)»: https://www.unitn.it/en/research/quality-research/vqr-2020-2024

MUR/DG Reform Project 21IT42, ITA.CON: "Improving the system of Knowledge Exchange- and Collaboration between universities and society in Italy": https://reform-support.ec.europa.eu/document/download/84d0d508-5558-4198-a8ac-6fb47891445a_en?filename=ITA.CON%20Output%203_%20KEC%20Summary%20Paper.pdf&prefLang=es

Processi per individuare le attività già in essere nel Paese riconducibili agli obiettivi del PNSA 2021-2027. Documento preparato dai membri del "Tavolo di lavoro per l'implementazione del Programma Nazionale per Scienza Aperta". 28 Aprile 2024.

Piano Nazionale della Scienza Aperta:ruolo ed azioni prioritarie Documento preparato dai Membri del"Tavolo di lavoro per l'implementazione del Programma Nazionale per Scienza Aperta" 14 novembre 2023.

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Ministerial Decree 637 (April 9, 2024), which allows universities and research institutions to directly recruit MSCA Seal of Excellence recipients and ERC grant winners as professors or researchers.

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Decreto Direttoriale_703 del 20-4-2022_ecosistemi PNRR

Strategy for the internationalisation of the Italian Higher Education System. https://www.agid.gov.it/en/agenzia/stampa-e-comunicazione/notizie/2024/02/13/published-2024-2026-three-year-plan-information-technology-public-administration

Annex 1 – Full list of ERA Dashboard 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.

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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