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ERA Country Report 2024
Türkiye

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Report

Research and Innovation

ERA Country Report 2024: Türkiye

European Commission
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ERA Country Report 2024
Türkiye

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2025 Directorate-General for Research and Innovation EN

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Key takeaways

- The year 2024 marked a significant shift in Türkiye's RD&I landscape with the introduction of the Twelfth Five Year Development Plan, which brought new actions and policies across various sectors. Structural changes and a substantial increase in funding allocated to RD&I activities in the 2024 budget demonstrate a concerted effort to modernise and improve the efficiency and effectiveness of the RD&I system.

- While not formally committed to any ERA Action, Türkiye is active across almost all ERA Actions and priorities, displaying a broad alignment of the national R&I strategies and instruments with the ERA Policy Agenda 2022-2024.

- However, translating these increased investments and policy changes into tangible outcomes will require ongoing effort and addressing persistent challenges, such as promoting balanced growth across all regions and sectors, fostering a more balanced "brain circulation", and developing robust monitoring mechanisms to assess the impact of these new policies and programmes.

1. National context

Türkiye is among the largest Associated Countries with a population of 85.3 million people in 2023. Türkiye is categorised as an *Emerging Innovator* in the latest 2024 European Innovation Scoreboard.[1] Türkiye currently performs below the EU average regarding GERD and researchers per million inhabitants (see Table 1). Its researcher base is concentrated in the private sector. Türkiye 's share of female researchers remains moderate with 37.3 percent.

Table 1 Structural Key Indicators

Indicator	EU27	Türkiye		
	2023	2023	Average 2018-2020	Average 2021-2023
GDP in current prices, euro per capita	35 790.00	10 150.00	8 593.33	8 623.33
Gross Domestic Expenditure on R&D (GERD) as a share of GDP	2.27	1.32	1.32	1.35
Size of the population (million)	448.80	85.28	81.99	84.52
Researchers (in FTE) per million inhabitants	4 681.34	2 545.04	1 823.84	2 458.02

Source: see Annex 1

2. Status of the Implementation of the ERA Policy Agenda

Chapter 2 briefly summarises **new developments in Türkiye since the publication of the ERA Country Report 2023**. Türkiye is an Associated Country and has not indicated commitments to actions identified in the ERA Policy Agenda 2022-2024. Despite this, this chapter briefly presents developments in Türkiye towards the overarching ERA Priorities. The findings are based on qualitative desk research and interviews.

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

The primary strategic framework guiding Türkiye's R&I policy are the **12th National Development Plan (2024-2028)**, published in November 2023. The 12th Development Plan sets ambitious targets for 2028, including increasing R&D expenditure to 2.05% of GDP, raising the private sector's share of R&D to 67%, and expanding the R&D workforce to 440,000 FTE personnel. Documents like TÜBİTAK's Strategic Plan (TÜBİTAK (2024), completes this framework by identifying specific actions. The Strategic Plan recognises the increasing importance of open science (**ERA Action 1**). The plan acknowledges challenges in promoting open access within Türkiye, including limited awareness and adoption of open science practices among researchers, and limited financial support for related initiatives. While some of the objectives include improving the innovation ecosystem in Türkiye, no specific objectives were identified regarding open science. As of late 2024, the **Aperta Türkiye Açık Arşivi (Turkish Open Archive)** hosted over 72,385 items, including 5,731 datasets, while the **Harman (Türkiye Academic Archive)** aggregated content from over 166 institutional repositories, totalling more than 4.2 million items. In 2024, ULAKBİM's **Open Course Platform** was expanded with nine new trainings on High-Performance Computing (HPC) topics, developed under the EuroCC 2 & EuroCC4SEE Projects. A significant development in 2024 was the

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

signing of a nationwide **transformative open access agreement with Springer Nature**[2], aiming to increase the global visibility of Turkish research. Furthermore, the new data centre for **TRUBA (Turkish Science e-Infrastructure)** located at METU Campus was commissioned in 2024, and its ARF supercomputer was launched in June 2024. The ARF system ranked 313th globally in the November 2024 Top-500 list, and its new AI cluster (ARF-ACC), activated in November 2024, ranked 230th.

On 12 March 2024, Türkiye adopted changes to its **Data Protection Law** (DPL) concerning conditions for processing special categories of personal data, conditions for transferring personal data abroad, and legal remedies for aligning with the EU's General Data Protection Regulation (GDPR)[3]. These amendments establish specific requirements that data controllers and processors must meet to fulfil cross-border data transfers. These changes are expected to increase the compliance of Turkish researchers in international research collaborations such as Horizon Europe Programme (**ERA Action 2**).

Higher Education Quality Council (YÖKAK)'s Strategic Plan identify several areas for improvement that are relevant to the reform of the research assessment system (**ERA Action 3**). Specifically, the plan's focus on developing new evaluation approaches, strengthening quality assurance, and increasing international cooperation support the goals of ERA Action 3 by promoting a more modern, internationally aligned, and robust approach to evaluation and accreditation. The plan's recognition of the need for a clearer legal framework in this area further underscores the potential for improvement in the current assessment system.

In addition, actions aiming at programme level assessment and evaluation are identified in TÜBİTAK's Strategic Plan (TÜBİTAK (2024)), which concerns development of policies targeting improvement of the innovation ecosystem. Objective 1.1 has been identified as “TÜBİTAK's activities will provide input to science and technology policies. The performance of ecosystem actors will be evaluated, and priority issues will be identified”. A significant increase in assessment activities has been targeted for the 2024-2028 term.

Moreover, according to the Presidential Decree “The Procedures and Principles Regarding the Implementation of Regulatory Impact Assessment”[4] published in 2022, impact assessments of government support programmes need to be carried out. After preparations and trainings provided by Presidency of Strategy and Budget[5], RD&I programmes managed by TUBITAK are among the first 12 programmes to be assessed and the work on assessment of two support programmes of TÜBİTAK has started in 2024.

The first three articles (Articles 544, 545 and 546) of the 12th Development Plan consists of plans and actions target “Strengthening the capacity and quality of R&D human resources and enhancing the attractiveness and sustainability of research careers” (**ERA Action 4**). National Technology Academy[6], an initiative as a part of the National Technology Initiative managed by the Ministry of Industry and technology, started providing programmes on AI, Autonomous Driving technologies and Chip Design in September 2024. The initiative collaborates with the private sector organisations to increase the capabilities of trainees through mentoring and experience-based learning opportunities and promote collaboration between academia and industry. In line with these national objectives, TÜBİTAK executed numerous

[2] https://ulakbim.tubitak.gov.tr/tr/haber/tubitak-springer-nature-acik-erisim-anlasmasi-imzalandi
[3] https://www.kvkk.gov.tr/Icerik/7834/6698-Sayili-Kisisel-Verilerin-Korunmasi-Kanununda-Yapilan-Degisiklikler-Hakkinda-Kamuoyu-Duyurusu
[4] https://dea.sbb.gov.tr/wp-content/uploads/2023/06/PROCEDURES-AND-PRINCIPLES-REGARDING-THE-IMPLEMENTATION-OF-REGULATORY-IMPACT-ASSESSMENT.pdf
[5] https://dea.sbb.gov.tr/
[6] https://www.milliteknolojiakademisi.gov.tr/

support programs in 2024. For example, the **2232-A International Leading Researchers Program** first call in 2024 resulted in 24 researchers being supported, while the second call with 12 applications was under evaluation at year-end. Cumulatively, the **2232 International Fellowship for Outstanding and Young Researchers Programme** had integrated 255 senior researchers into Türkiye's R&I ecosystem by December 2024, who involved 1,369 students and researchers in their projects. The **2244 Sanayi Doktora Programı (Industrial PhD Program)** saw 75 doctoral researchers transition to employment by the end of 2024. The **2247-C STAR – Intern Researcher Programme** supported 1,733 undergraduate students, 39 high school students, and 45 teachers in R&D projects through its 2024 calls. Additionally, the **2250 Graduate Scholarships Performance Program** supported 5,850 doctoral students/post-doctoral researchers from 6,042 applications in its 2024 calls. A significant development in 2024 was the awarding of TÜBİTAK's **Co-Funded Brain Circulation Scheme 3 (CoCirculation3)** proposal under the MSCA COFUND 2023 call (results in 2024), securing EUR 9.5 million from the EC with TÜBİTAK co-financing EUR 6.12 million to support 100 postdocs between 2025-2030.

The 12th Development Plan, includes a whole section targeting equitable opportunities for men and women, including targets for institutions to generate data based on specific criteria, including gender, age, immigrant status, disability, and location (**ERA Action 5**). There were no explicit targets identified in TUBİTAK's Strategic Plan (TÜBİTAK, 2024) targeting gender policies in addition to already existing GEP action plan[7]. A new round for Council of Higher Education (CoHE) Barrier-Free University Awards was executed in 2024 to promote the efforts of universities activities towards students with disabilities[8].

The 12th Development Plan also targets university-industry-public cooperation under the heading of "Production Structure and Service Delivery Forms Transformed by Technological Developments" target (**ERA Action 7**). As a result the MoIT strategy included targets (objective) for developing clusters, R&D centres and Technology Development Zones (TGBs) and TÜBİTAK strategy includes targets such as "Developed technologies will be transformed into commercialisation focussed and exportable products" (target 2.4), "New business models to enhance commercialisation potential of research will be developed" (target 1.2) and "Measures will be taken for the development of the ecosystem for increasing the activities of R&D, innovation, and design at R&D centres regarding competence, collaboration, governance and financing" (target 3.2) for the 2024-2028 term.

Concrete steps for ERA Action 7 in 2024 included the **TÜBİTAK 1812 BiGG Yatırım Programı (BiGG Investment Programme)**: the 2024-1 call supported 117 entrepreneurs (100 companies established), and the 2024-2 call supported 134 entrepreneurs (107 companies established by year-end). The **TÜBİTAK BiGG+ Venture Capital Investment Fund** was also established in 2024 in collaboration with Kalkınma Girişim Sermayesi Portföy Yönetimi A.Ş. to provide seed investment to BiGG graduates. Under the **Global Cleantech Innovation Programme (GCIP) Türkiye**, 36 teams participated in the 2024 Accelerator, and 6 GCIP-linked startups received investment via the 1812 BiGG program in 2024. The **1505 Üniversite-Sanayi İşbirliği Destek Programı (University Industry Collaboration Programme)** saw 116 applications in 2024, with 59 projects starting their support process. The **1707 Order-Based R&D Projects for SMEs Support Call** supported 73 new projects in 2024, bringing the total to 336. The **Plug-in Scheme** for EIC Accelerator, received EC

[7] https://tubitak.gov.tr/sites/default/files/18842/gep_actionplan.pdf

[8] https://engelsiz.yok.gov.tr/Sayfalar/Haberler/2024/yuksekogretim-kurulundan-engelsiz-universitelere-bayrak-ve-nisan-odulu.aspx

approval in April 2024 for three TÜBİTAK programs, and TÜBİTAK launched two national Plug-In calls in 2024, resulting in 35 companies being registered.

The 12th Development plan includes a detailed plan for "Increasing the activities of research infrastructures in RD&I ecosystem with a structure that conducts frontier research, employs qualified human resource and works in cooperation with the private sector" (article 548 and sub articles) (**ERA Action 8**). As for the actions, TÜBİTAK has opened the third-round of the 1004 support programme in February 2024 with significant budget increase to establish high-tech and green focused technology platforms among the excellence centres (6,550 centres)[9] and a novel support programme was started to support cooperation among 1004 platforms and the call was opened in August 2024[10], with 30 applications received and evaluations ongoing at year-end. The new approach promotes establishment of platforms where the infrastructure collaborates with the private sector R&D centres and start-ups. Under Law No. 6550, two new research infrastructures, **Sivas Cumhuriyet University Nanophotonics Application and Research Center (CÜNAM)** and **Boğaziçi University Targeted Treatment Technologies Center (HTTM)**, received qualification in 2024 and started receiving performance-based funding, bringing the total number of such RIs to 11.

Article 555 of the 12th Development Plan involves targets related to international cooperation as "Bilateral, regional and multilateral collaborations will be developed, especially with EU countries, in terms of R&D activities, research infrastructures and researcher human resources" (**ERA Action 9**). In 2024, TÜBİTAK's International Cooperation Department (UIDB) signed 6 new cooperation agreements (with Iraq, Indonesia, the UK British Council, Ghana, Iran, and Norway) and renewed two existing agreements (with Azerbaijan and South Korea's KIAT). Overall, TÜBİTAK launched 31 bilateral calls with 23 countries, which attracted 968 project proposals, and participated in 32 multilateral platform calls, receiving 531 proposals in 2024. Türkiye's chairmanship of EUREKA ended in June 2024, culminating in the Global Innovation Summit held in Istanbul. Regarding Horizon Europe, by the end of 2024, Turkish participants had secured EUR 320.8 million through 934 participations involving 1,034 Turkish stakeholders in projects, with 48 of these projects being coordinated by Turkish entities. TÜBİTAK's support programs for Horizon Europe demonstrated significant activity in 2024; for instance, 75 individuals were approved for Travel Support, and 36 Principal Investigators (PIs) were approved for the ERC Principal Investigator Development Program.

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

While there are no explicit references to the EU missions and partnerships (**ERA Action 10**), the 12th Development plan and strategic technology research areas document prepared by TÜBİTAK has clear objectives related to promotion of green and clean technologies, blue economy, smart and integrated ecosystem observation systems, smart integrated energy systems, sustainable agriculture and soil health technologies and digitalisation technologies which match closely with the missions and partnerships of ERA.

In addition, to foster the development of high value-added products or product groups that can contribute to Türkiye's green growth, R&D and innovation networks will be supported (**ERA Action 11**). This initiative is funded by the World Bank and coordinated by TÜBİTAK and KOSGEB with a budget of USD 450 million in the following six years starting in 2024. As

[9] https://1004.tubitak.gov.tr/tr/node/145
[10] https://1004.tubitak.gov.tr/tr/node/225

part of the project TÜBİTAK has opened two 1833 Industry Innovation Networks Mechanism (SAYEM) Green Transformation calls[11] to support RD&I activities, attracting 19 platform applications that involved 177 stakeholders for 135 projects. The "1832 Green Transformation in Industry Call" saw three calls opened in 2024. The initial two calls resulted in 124 projects being supported and during 2024, 40 of these projects were contracted. The support programme provides loans making it the first loan-based support programme for RD&I activities managed by TÜBİTAK. Further, a mentoring support call was opened by TÜBİTAK to help SMEs in their green transformation efforts[12], where 291 SME applications had been received, with 250 approved for support in 2024. These support programmes are complementary to the "Green Transition Support Programme"[13] introduced by the Ministry of Industry and Technology. The Ministry of Industry and Technology's new "Emerging Innovative Technologies Call" was announced in August 2024, having received 294 full proposals. Furthermore, the "High Tech Investment Programme (HIT-30)" was unveiled in July 2024, committing USD 30 billion in incentives for high-technology sectors.

In a similar vein, Türkiye's 12th Development Plan and the supporting strategic documents focus on accelerating the green and digital transition of key industrial ecosystems (**ERA Action 12**). The plan emphasises the need for increased productivity and competitiveness through green and digital transformation, particularly within the manufacturing industry. The Ministry of Industry and Technology's Strategic Plan promotes developing a dynamic production structure focused on green and digital technologies, with policies supporting investment and export growth in priority sectors like chemicals, pharmaceuticals, electronics, machinery, electrical equipment, and automotive industries. TÜBİTAK's Strategic Plan further reinforces this focus, emphasizing increased domestic production of high-tech goods and support for R&D and innovation activities related to digital transformation and green technologies. One of the main programmes for digital transformation is the KOSGEB support programme for Turkish manufacturing SMEs under the Digital Transformation Financing Facility ("DTFF") financed by European Bank for Reconstruction and Development (EBRD)[14]. TÜBİTAK has been involved in the programme through developing a methodology for SMEs to develop digital technologies roadmaps[15]. Further support was provided by TÜBİTAK in developing the RD&I ecosystem for digital transformation through the new rounds of AI Ecosystem development calls[16].

Concerning **ERA Action 13,** the YÖKAK Strategic Plan (2024-2028) focuses on strengthening quality assurance processes in HEIs and improving their international standing. It promotes the development of flexible learning pathways, encourages international collaboration, and aims to enhance the quality and quantity of academic staff.

Finally, several initiatives within TÜBİTAK's 2024-2028 Strategic Plan demonstrate Türkiye's commitment to promoting public engagement with science (**ERA Action 14**). The plan emphasises fostering a "science, technology, and innovation culture" among the public (Strategic Goal 3, Target 3.4). Specific programmes like TÜBİTAK's support for science centres and science festivals, along with initiatives like the Science Talks and publications such as Science for Children magazine, aim to make science more accessible and engaging for various age groups. Additionally, the plan highlights the importance of utilizing digital platforms and increasing digital literacy to broaden access to scientific information. The opening of new

[11] https://tubitak.gov.tr/tr/destekler/sanayi/ulusal-destek-programlari/1833-sayem-yesil-donusum-cagrisi
[12] https://tubitak.gov.tr/tr/destekler/destek/sanayi/ulusal-destek-programlari/cagri-1831-yesil-inovasyon-teknoloji-mentorluk-cagrisi
[13] https://www.resmigazete.gov.tr/eskiler/2024/07/20240726-19.htm
[14] https://www.ebrd.com/work-with-us/projects/psd/54760.html
[15] https://ddxmodel.tubitak.gov.tr/
[16] https://tubitak.gov.tr/en/funds/sanayi/ulusal-destek-programlari/1711-artificial-intelligence-ecosystem-call

Science Centres in collaboration with municipalities and related stakeholders of different cities during the 2023-2024 term continued[17]. In 2024, TÜBİTAK's Deneyap Technology Workshops initiated a new training period for 16,119 students. Seven physics-themed TÜBİTAK Science Camps were held in 2024 in collaboration with the Ministry of Youth and Sports. Calls for the National Technology Workshops project support were announced in September 2024, targeting establishment in 17 universities initially. The 4001 National and International Competition/Event Participation Support was launched in August 2024, supporting 3 applications by year-end. Science Talks saw 1,385 events in 2024. For TEKNOFEST, major events to promote science and technology coordinated by Ministry of Industry and Technology together with NGOs, events were held in Antalya (TEKNOFEST Mediterranean) and Adana in 2024, the latter attracting 1.1 million visitors and over 1.65 million youth participants in competitions.

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

The National Strategy for Regional Development (NSRD)[18] for the period 2024-2028 was prepared under the coordination of the Ministry of Industry and Technology (MoIT) in December 2023. This strategy aims to guide regional development by incorporating an analysis of sectoral agglomerations and clusters, and it adopts a fundamental smart specialization approach. A key achievement linked to the NSRD is that all 26 Regional Development Agencies in Türkiye have formulated their respective regional innovation and smart specialization strategies based on its framework. The action “Capacity Enhancement for Development and Implementation of Smart Specialization Strategies in Turkey’s Regions Project” executed as a part of the EU Instrument for Pre-Accession (IPA) aims to increase the development and implementation capacity of Smart Specialisation Strategies especially through Regional Development Agencies[19] (**ERA Action 15**).

One of the main pillars of Türkiye’s efforts in improving EU-wide access to excellence is association in the Horizon Europe programme (**ERA Action 16**). The National Coordination Office (NCO) managed by TÜBİTAK coordinates the efforts for increasing the interest towards Horizon Europe through awareness raising events and support programmes[20]. Currently, Türkiye leads in attracting newcomers to Horizon Europe[21]. A new project called “Technical Assistance for Türkiye in Horizon Europe,” funded through the EU IPA programme, started in September 2024, to help increase the capacity of Turkish stakeholders in the following 42 months.

TÜBİTAK's 2024-2028 Strategic Plan prioritises strengthening research infrastructure, supporting basic and applied research through dedicated grant programmes, and promoting collaboration between universities, research institutions, and the private sector. University-Industry Service Platforms of Türkiye (USIMP) is actively involved in assessing, developing, and delivering management capacity development programmes for research professionals and has a cooperation programme with TUBITAK (**ERA Action 17**)[22].

[17] https://bilimmerkezleri.tubitak.gov.tr/Icerik/buyuk-olcekli-bilim-merkezi-projeleri-11
[18] https://www.sanayi.gov.tr/bolgesel-kalkinma-faaliyetleri/strateji-belgeleri/01135b
[19] https://www.smartturkiye.org/
[20] https://ufukavrupa.org.tr/en/tubitak-supports
[21] https://sciencebusiness.net/network-updates/tubitak-turkiye-leads-attracting-newcomers-horizon-europe
[22] https://www.usimp.org.tr/en

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

The second EU-Türkiye High Level Dialogue on Science, Technology and Innovation took place in April 2024 in Istanbul, gathering important stakeholders from the Turkish and European research areas. It underlined strengthening EU-Türkiye cooperation in science, technology, and innovation with an emphasis on the green and digital transformation of industries, as well as building thriving innovation ecosystems[23].

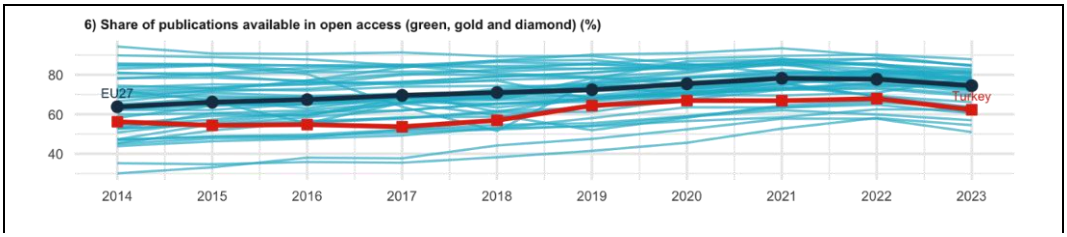
While Türkiye has not committed officially to **ERA Action 19**, Türkiye provides data for all indicators of the European Innovation Scoreboard[24]. TÜBİTAK, Strategy Plan (2024-2028) emphasises establishment of new policy tools and monitoring mechanisms to effectively monitor the performance of TARAL.

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

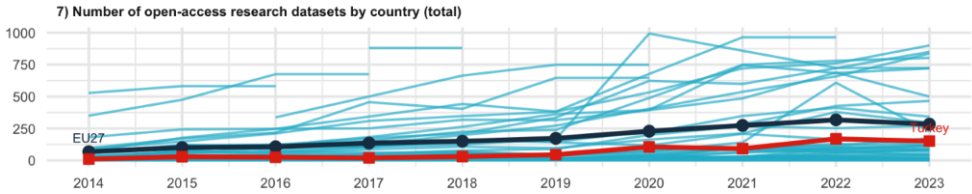
This chapter provides a qualitative assessment of how the joint ERA Actions contributed to Türkiye's performance in achieving the ERA objectives as defined in the Pact for R&I during the period 2022-2024.

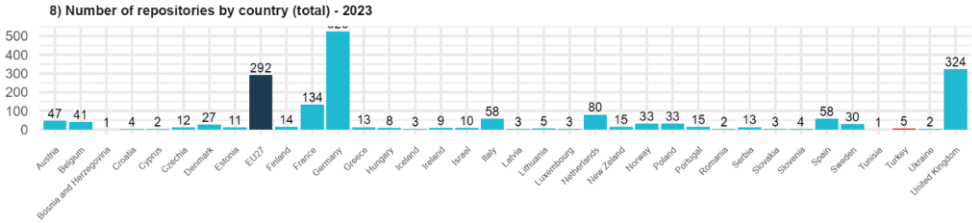
National TARAL policies have similar policies addressing all ERA actions related to **ERA Priority 1** except for **ERA Action 6**. TARAL Actions introduced in 2024 aim to create structural reforms by introducing new forms of support other than grant supports,[25] introduction of platform based collaborative support schemes for RD&I infrastructures and simplification and consolidation of different RD&I support programmes. The implementation of these activities in largely on track and supported by dedicated investments. Since many of these actions are introduced in 2024, their effects will be seen in the ERA Dashboard Indicators in the following years. Türkiye's position in many of the ERA Dashboard Indicators (6-7, 12-14) suggests similar changes to EU averages, whereas ERA Dashboard Indicators 21, 23, and 26[26] show performance increases in patent applications and business RD&I activities. The biggest decline has been in ERA Dashboard Indicator 33 on budget allocations for R&D, mainly caused by the devaluation of Turkish Lira and economic slowdown causing a drop in investments including RD&I investments.

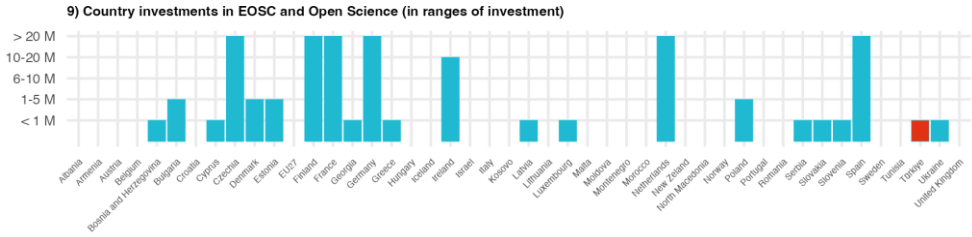
Figure 3-1 Indicators for ERA Priority 1

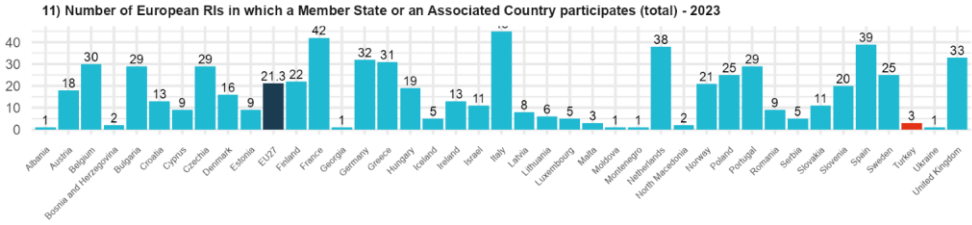


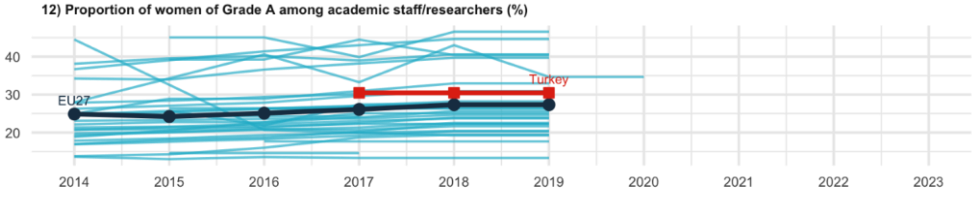
[23] https://ufukavrupa.org.tr/en/news/eu-turkiye-horizon-europe-joint-research-and-innovation-committee-meeting-2024-took-place
[24] https://neighbourhood-enlargement.ec.europa.eu/document/download/8010c4db-6ef8-4c85-aa06-814408921c89_en?filename=T%C3%BCrkiye%20Report%202024.pdf
[25] E.g., loan-based R&D supports, establishment of funds and fund of funds including private investors, increasing directionality of tax incentives towards increased RD&I investments),
[26] Source: Interview 1; Focus Group 1

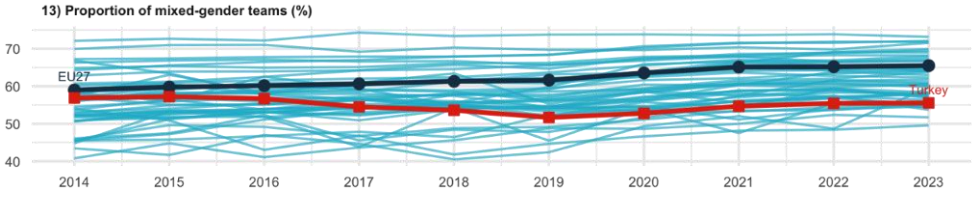

7) Number of open-access research datasets by country (total)
1000
750
500
250
0
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

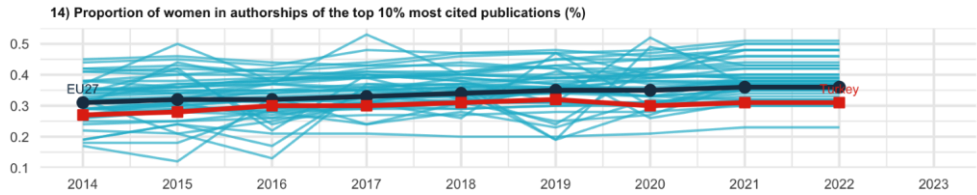

8) Number of repositories by country (total) - 2023
500
400
300
200
100
0
47
41
1
4
2
12
27
11
292
14
134
13
8
3
9
10
58
3
5
3
80
15
33
33
15
2
13
3
4
58
30
1
5
2
324
Austria
Belgium
Bosnia and Herzegovina
Croatia
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Latvia
Lithuania
Luxembourg
Netherlands
New Zeland
Norway
Poland
Portugal
Romania
Serbia
Slovakia
Slovenia
Spain
Sweden
Tunisia
Turkey
Ukraine
United Kingdom

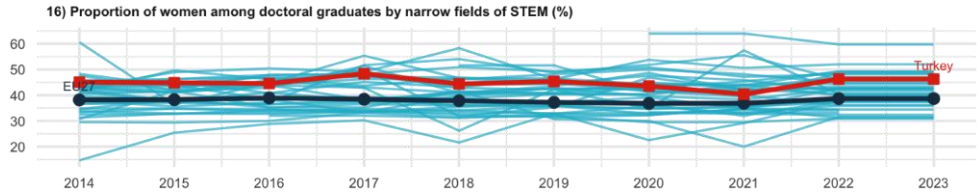

9) Country investments in EOSC and Open Science (in ranges of investment)
> 20 M
10-20 M
6-10 M
1-5 M
< 1 M
Albania
Armenia
Austria
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kosovo
Latvia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

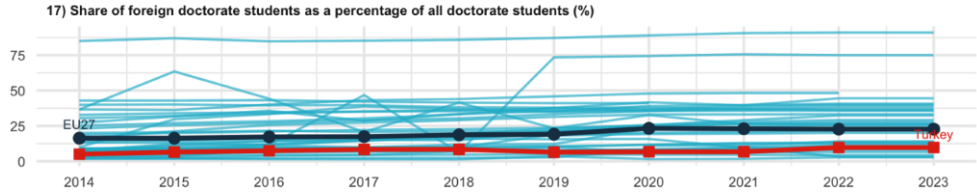

11) Number of European RIs in which a Member State or an Associated Country participates (total) - 2023
40
30
20
10
0
1
18
30
2
29
13
9
29
16
9
21.3
22
42
1
32
31
19
5
13
11
8
6
5
3
1
1
38
2
21
25
29
9
5
11
20
39
25
3
1
33
Albania
Austria
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
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

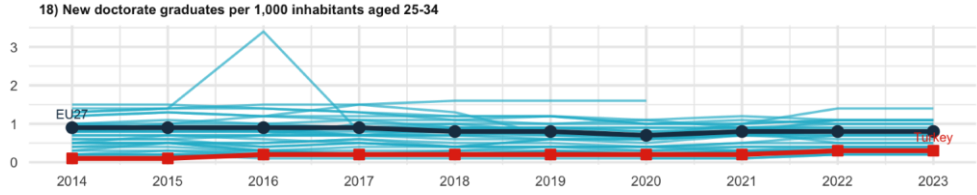

12) Proportion of women of Grade A among academic staff/researchers (%)
40
30
20
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

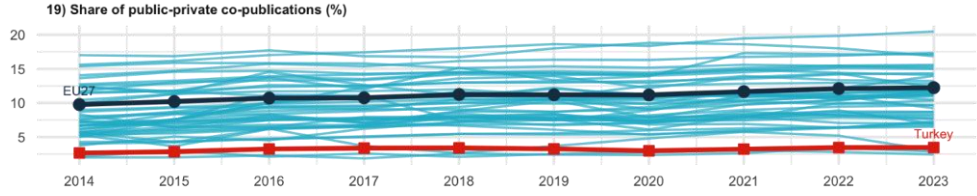

13) Proportion of mixed-gender teams (%)
70
60
50
40
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

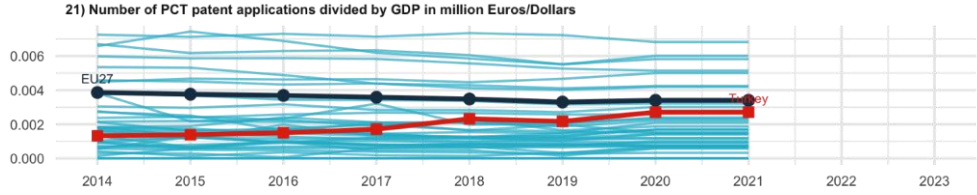

14) Proportion of women in authorships of the top 10% most cited publications (%)
0.5
0.4
0.3
0.2
0.1
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

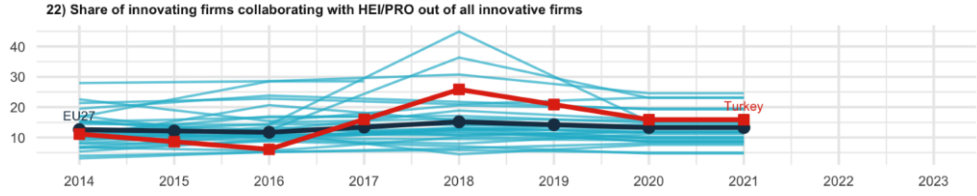

16) Proportion of women among doctoral graduates by narrow fields of STEM (%)
60
50
40
30
20
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

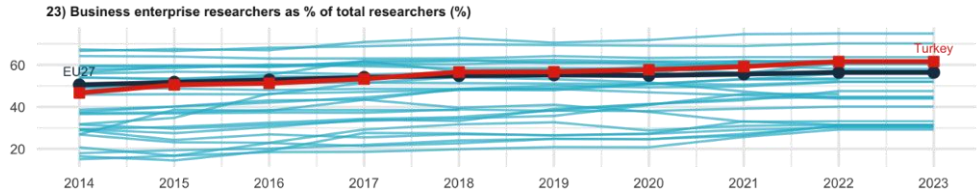

17) Share of foreign doctorate students as a percentage of all doctorate students (%)
75
50
25
0
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

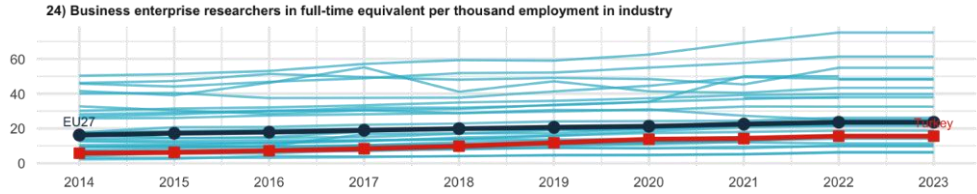

18) New doctorate graduates per 1,000 inhabitants aged 25-34
3
2
1
0
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

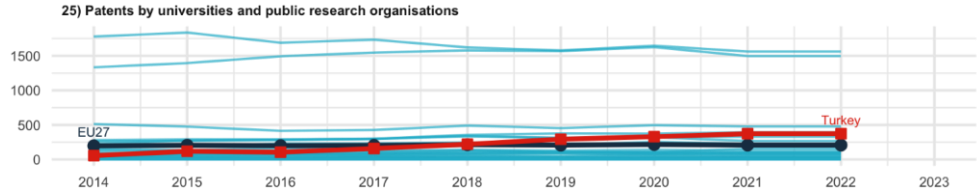

19) Share of public-private co-publications (%)
20
15
10
5
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

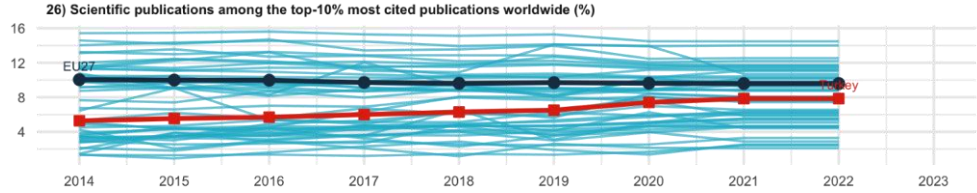

21) Number of PCT patent applications divided by GDP in million Euros/Dollars
0.006
0.004
0.002
0.000
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

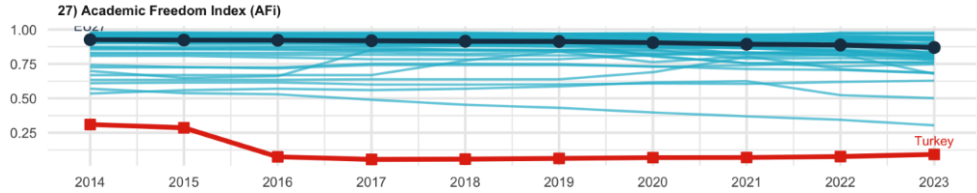

22) Share of innovating firms collaborating with HEI/PRO out of all innovative firms
40
30
20
10
EU27
Turkey
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

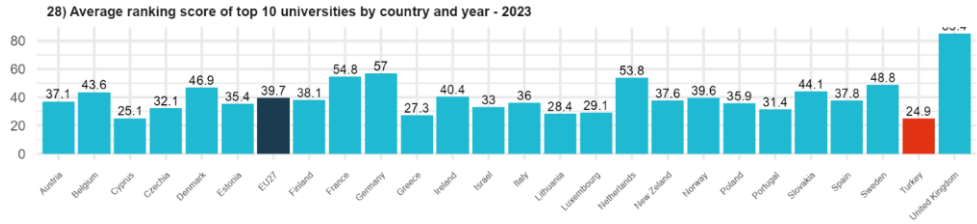

23) Business enterprise researchers as % of total researchers (%)
Turkey
EU27
60
40
20
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

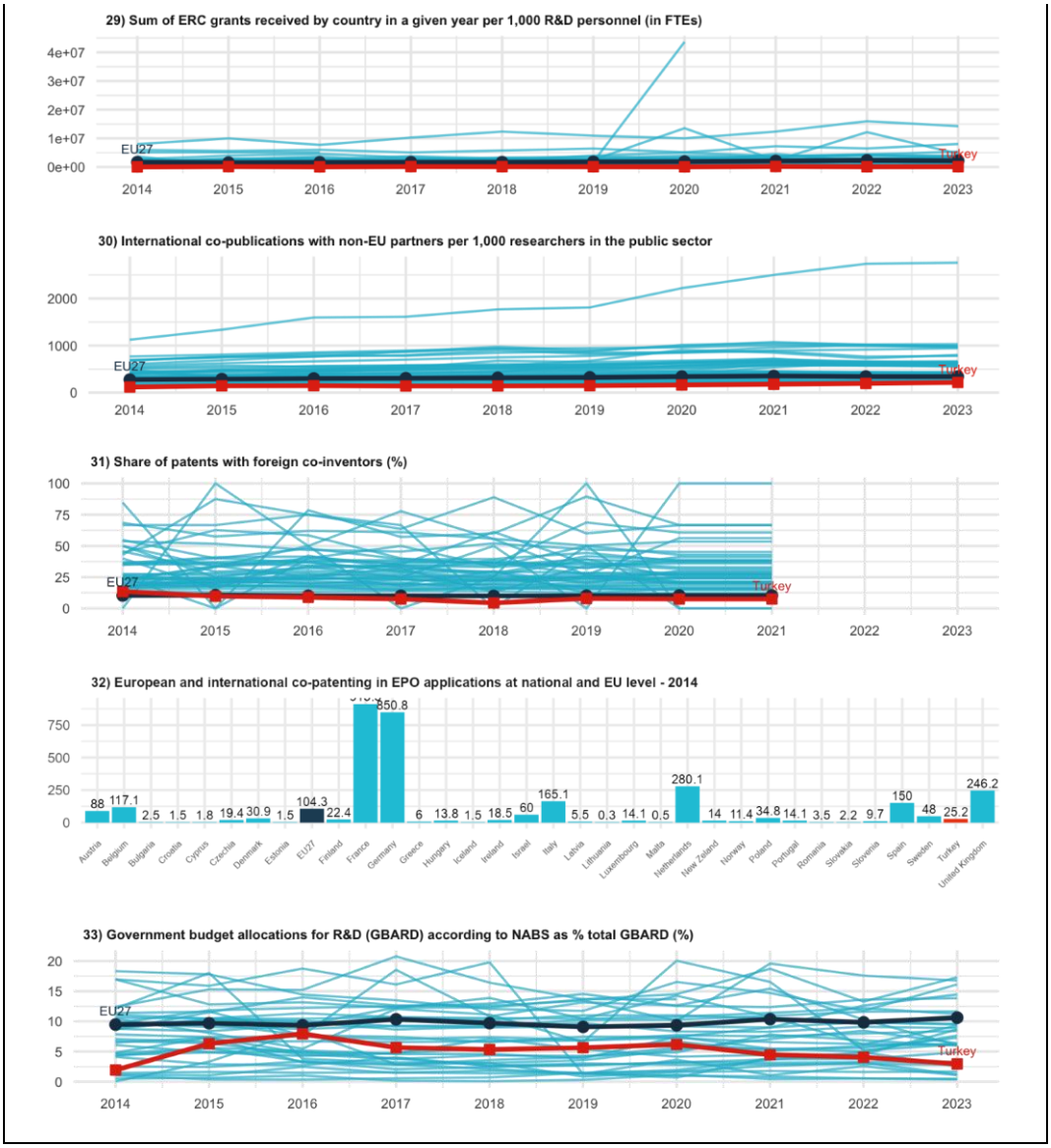

24) Business enterprise researchers in full-time equivalent per thousand employment in industry
60
40
20
0
EU27
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


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


27) Academic Freedom Index (AFi)
1.00
0.75
0.50
0.25
Turkey
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 Zeland
Norway
Poland
Portugal
Slovakia
Spain
Sweden
Turkey
United Kingdom



Source: see Annex 1

ERA Priority 2 is mainly addressed through Türkiye's association into Horizon Europe programmes, bilateral and multi-lateral international cooperation agreements, support programmes towards twin transition of industries and a wide range of actions for science communication, especially through establishment of science centres. While most of the strategies have been in place since 2020, the high the high inflation rates, devaluation of Turkish Lira and the following economic slowdown has decreased the effectiveness of Actions. This caused the investments on RD&I activities to decrease as seen in ERA Dashboard Indicators 35 and 43. There were significant updates in 2024 increasing the funding for support programmes, and new programmes introduced targeting green and digital technologies from both national and international financial institutions such as World Bank and EBRD.

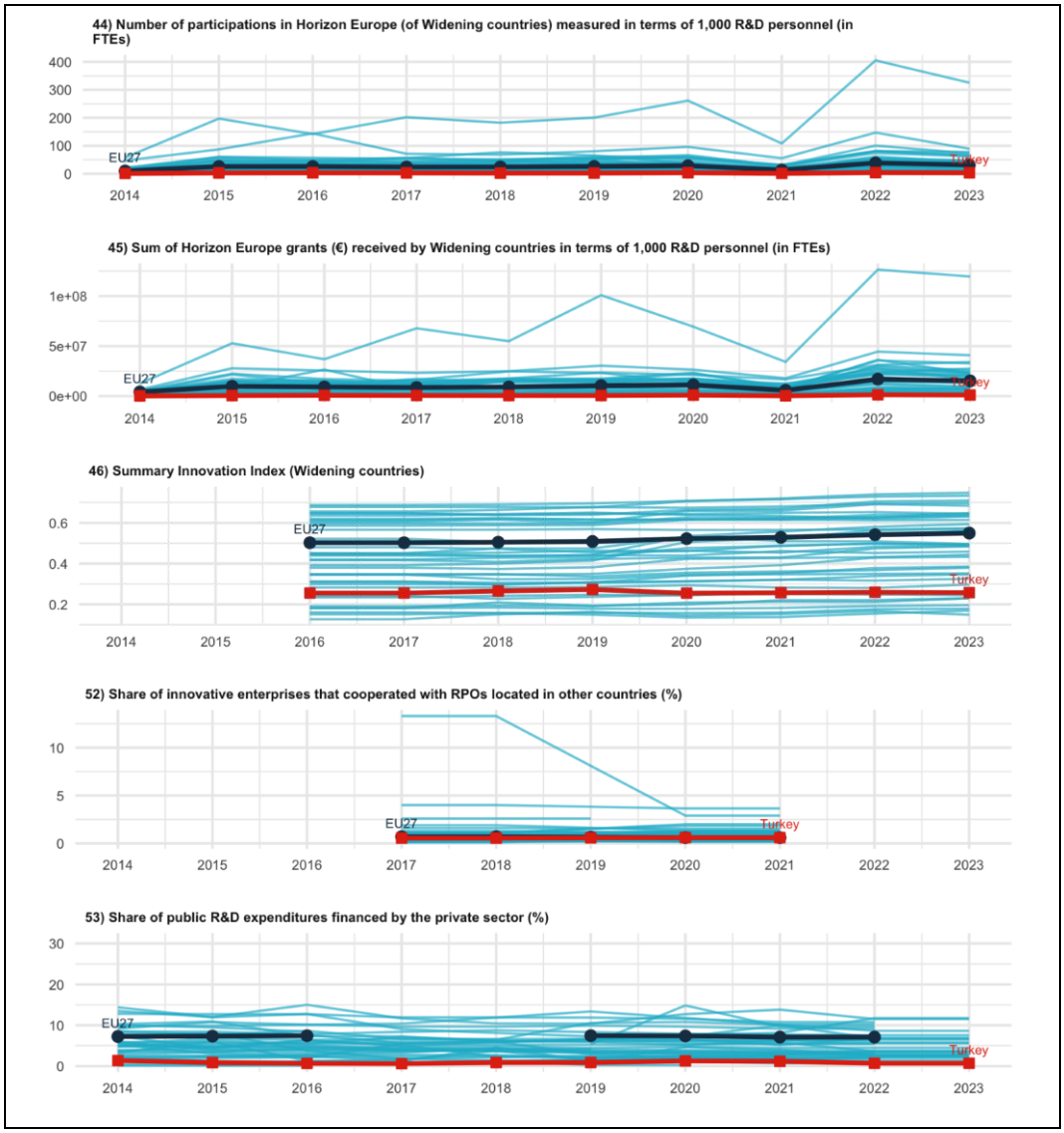
Figure 3-2 Indicators for ERA Priority 2

Source: see Annex 1

ERA Priority 3 is addressed through introduction of smart specialisation strategies in regions and active promotion of Horizon Europe programmes through the National Coordination Office of TÜBİTAK. Both these actions are supported through projects supported by the IPA programme of EU. According to the Horizon Dashboard, the amount of support received from

Horizon Europe Programme (EUR 299.2 million) by Turkish participants in the first four years of programme, have already surpassed the amount received from the whole Horizon 2020 programme (EUR 274.4 million).

Figure 3-3 Indicators for ERA Priority 3 with comparison across MS/AC



Source: see Annex 1

ERA Priority 4 is addressed through Türkiye's own policy making mechanisms towards TARAL actions. The 12th Development Plan and related organisations such as MoIT and TÜBİTAK have already published their own strategic plans for 2024-2028 terms in compliance with the 12th Development Plan. All the plans aim to introduce more advanced monitoring mechanisms to follow the performance of TARAL.

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

This chapter presents a qualitative assessment of the ERA Actions and the effects on the national R&I system, including the quantitative performance in the ERA Dashboard. While Türkiye has not officially committed to ERA Actions, the 12th Development Plan and especially the TUBITAK Strategic Plan (2024-2028) identify strategies and actions contributing to the ERA Priorities.

TÜBİTAK's commitment to enhancing the information technology, software, cybersecurity, and open-source software ecosystem (Strategic Goal 1, Target 1.2) directly supports ERA Action 1 by improving digital infrastructure essential for open science. Increasing R&D funding and providing support for researchers through initiatives such as the "International Leading Researchers Program" and doctoral programmes (Target 3.3) can also contribute to improved knowledge circulation. TÜBİTAK also aims to develop policies and carry out international collaborations focused on strategic R&D and innovation areas (Target 1.3), promoting a more open and interconnected research ecosystem, as envisioned in **ERA Priority 1**.

TÜBİTAK's Strategic Plan supports the twin green and digital transition through specific R&D programmes (Target 2.4). relating to **ERA Priority 2.** Half of the critical products and technologies identified in the roadmap directly address green transformation. Moreover, TÜBİTAK prioritises research and development of digital and green technologies in its "Priority R&D and Innovation Areas Study" (under its mission of increasing R&D and innovation activities in the country). Although not explicitly linked to specific ERA Actions under this priority, these efforts broadly align with ERA Priority 2's goals of fostering a sustainable, digitally driven, and resilient economy and society.

TÜBİTAK's Strategic Plan supports improving access to excellence through establishing and developing R&I platforms (Target 3.1), promoting university-industry collaboration, supporting R&D centres (Target 3.2), and developing technology development zones (Target 3.3) (**ERA Priority 3**). Supporting the development of research universities across Türkiye can help raise the standards of research and education and create centres of excellence within the country. By providing resources, fostering collaboration, and supporting technology commercialisation, these initiatives aim to build capacity and improve access to research infrastructure, funding, and expertise, thereby increasing access to excellence for researchers and innovators across Türkiye.

TÜBİTAK works on targets related to **ERA Priority 4** through its strategic goals of increasing R&D and innovation activities (Goals 1 and 2) and strengthening the national R&I ecosystem (Goal 3). Specifically, the plan aims to increase R&D investments, support doctoral programmes and researchers (Target 3.3), and promote technology transfer and commercialisation (Target 2.4). TÜBİTAK’s emphasis on developing a "national technology initiative" based on priority areas and fostering collaboration with strategic international partners aligns with the ERA's focus on supporting national R&I strategies and reforms. Improving administrative efficiency and strategic management (Goal 4) and institutional internationalisation (Goal 5, Target 5.5) in RDI can also contribute to greater efficiency and effectiveness in the national R&I system. TÜBİTAK’s aim to produce policy proposals for national needs through data-driven policymaking (Target 2.1) and to support policy implementation through policy evaluation (Target 2.2) also can be used as a base to reform the system as well.

5. Conclusions

Türkiye remains committed to the principles and objectives of the ERA. The year 2024 marked a significant shift in the national RD&I landscape with the introduction of the 12th Five Year Development Plan, which brought new actions and policies across various sectors, aiming to strengthen the national R&I ecosystem and enhance its contribution to economic and social development. Structural changes, including increased directionality of funding towards strategic priorities, introduction of new forms of support like loan-based R&D programmes, establishment of funds together with private sector, and simplification of administrative and bureaucratic processes, demonstrate a concerted effort to modernise and improve the efficiency and effectiveness of the RD&I system.

While the economic slowdown and high inflation experienced in previous years had negatively impacted RD&I investments, the 2024 budget saw a substantial increase in funding allocated to RD&I activities, signalling a renewed commitment to supporting research and innovation despite these economic challenges. However, translating these increased investments and policy changes into tangible outcomes will require ongoing effort and addressing persistent challenges, such as promoting balanced growth across all regions and sectors, fostering a more balanced "brain circulation", and developing robust monitoring mechanisms to assess the impact of these new policies and programmes.

Strengthening national policies and strategies in areas such as knowledge valorisation, academic freedom, and public engagement with science, along with continued efforts to collect and analyse gender-disaggregated data and promote gender equality, will be essential for fully realizing the transformative potential of the Turkish R&I system and deepening its integration within the ERA. Active participation in Horizon Europe and other relevant EU programmes and initiatives will remain crucial for fostering collaboration with European partners and contributing to a more open, inclusive, and impactful European research and innovation landscape.

6. References

European Commission (2021). *European Research Area Policy Agenda: Overview of actions for the period 2022-2024*. https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf

European Commission (2023). *ERA Country Report 2023: Türkiye*.

T.C. Sanayi ve Teknoloji Bakanlığı (2024). *Stratejik Plan 2024-2028*. (Ministry of Industry and Technology Strategic Plan 2024-2028). https://www.sanayi.gov.tr/plan-program-raporlar-ve-yayinlar/stratejik-planlar.

TÜBİTAK (2019). *TÜBİTAK Open Science Policy*. https://european-research-area.ec.europa.eu/documents/tubitak-open-science-policy.

TÜBİTAK (2025). *2024 Yılı Faaliyet Raporu*. (2024 Annual Report). https://tubitak.gov.tr/sites/default/files/2025-03/TUBITAK_2024_Yili_Faaliyet_Raporu.pdf

TÜBİTAK (2024). *Ar-Ge ve Yenilik Konu Başlıkları 2024-2025*. (R&D and Innovation Topics 2024-2025). https://tubitak.gov.tr/sites/default/files/2024-11/TUBITAK_24-25_Ar-Ge_ve_Yenilik_Konu_Basliklari_18.11.24.pdf

TÜBİTAK (2023). *Yeşil Büyüme Teknoloji Yol Haritası*. (Green Growth Technology Roadmap). https://tubitak.gov.tr/tr/kurumsal/politikalar/yesil-buyume-teknoloji-yol-haritasi

TÜBİTAK (2024) *2024-2028 Stratejik Planı*. (TÜBİTAK 2024-2028 Strategic Plan). https://tubitak.gov.tr/sites/default/files/2024-10/tubitak_2024-2028_stratejik_plani_1.pdf

Turkish Higher Education Quality Council (YÖKAK) (2024). *2024-2028 THEQC Strategic Plan.* https://www.yokak.gov.tr/documents/site-stratejikplan/Yokak_2024_2028_Stratejik_Plan.pdf)

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.

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

Table 1 Structural Key Indicators:

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

Figure 3.1 Indicators for ERA Priority 1

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

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

Figure 3.2 Indicators for ERA Priority 2

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

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

Figure 3.3 Indicators for ERA Priority 3

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

Figure 3.4 Indicators for ERA Priority 4

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

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ERA Monitoring 2024: ERA Country Report Türkiye.

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