European Commission

ERA Country Report 2024
Sweden

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Report

Research and Innovation

ERA Country Report 2024: Sweden

European Commission
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Manuscript completed in June 2025

EUROPEAN COMMISSION

ERA Country Report 2024

Sweden

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as part of the project ‘Implementation of the ERA Monitoring Mechanism’ for the European Commission, Directorate-General for Research and Innovation (RTD/2023/OP/0017)

2025 Directorate-General for Research and Innovation EN

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Key takeaways

- Sweden is an innovation leader strongly committed to the goals of the ERA and the ERA Policy Agenda, having actively implemented eleven out of the 17 implemented ERA Actions. The primary focus areas of Sweden's national ERA implementation are Priorities 1 and 2. Key stakeholders are setting priorities, reflecting Sweden's actors-oriented approach.

- Sweden's research and innovation (R&I) policies and investments align closely with ERA objectives, as reflected in the long-term strategic direction outlined in the 2020 and 2024 research bills.

- Sweden demonstrates overall stable and consistent progress towards their prioritised goals of the ERA. Progress is evident in areas such as open science, research careers, and international collaboration, which aligns well with ERA Priorities.

- In terms of progress towards the ERA objectives, further efforts are needed to accelerate the green transition and address persistent gender equality gaps in specific areas.

1. National context

Sweden is one of the *medium-sized* EU member states, with a population of around 10.5 million people. Sweden is categorised as an *innovator leader,* only overtaken by Denmark, in the latest 2024 European Innovation Scoreboard.[1] Sweden's research expenditure surpasses the EU average on several fronts. Its GERD and BERD are notably high, both exceeding the average relative to GDP. Additionally, GBARD are slightly above the EU average.

Table 1 Structural Key Indicators

Indicator	EU27	Sweden		
	2023	2023	Average 2018-2020	Average 2021-2023
GDP in current prices, euro per capita	35 790.00	52 490.00	46 480.00	50 150.00
Gross Domestic Expenditure on R&D (GERD) as a share of GDP	2.27	3.47	3.42	3.45
Government Budget Allocations for R&D (GBARD) as share of GDP	0.73	0.75	0.76	0.76
Business Enterprise expenditure on R&D (BERD) as a share of GDP	1.52	2.56	2.45	2.53
Expenditure on R&D procurement as a percentage of GDP	0.06	0.03	/	0.03
Size of the population (million)	448.80	10.52	10.23	10.45
Researchers (in FTE) per million inhabitants	4 681.34	9 953.96	7 622.22	9 849.35
Share of female researchers, all sectors of performance (%)	33.71	/	/	/

Source: see Annex 1

2. Status of the Implementation of the ERA Policy Agenda

Chapter 2 briefly summarises **new developments in Sweden 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.

Sweden's R&I policies and investments, as reflected in the long-established trajectory of its research strategies outlined in the 2020[2] and 2024[3] research bills, demonstrate a strong overall alignment with the ERA actions.

Sweden has committed to **10 out of 17 ERA Actions** that were implemented (see Table 2). The main focus areas of the national ERA implementation are Priorities 1 and 2. In Sweden, ERA actions are prioritised and implemented through a bottom-up approach. Coordination is handled by the national Steering Committee, which gathers input from key stakeholders in the research sector to set priorities. During this implementation period, Sweden did not

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

[2] Utbildningsdepartementet (2020). Forskning, frihet, framtid – kunskap och innovation för Sverige. Proposition 2020/21:60. https://www.regeringen.se/contentassets/da8732af87a14b689658dadcfb2d3777/forskning-frihet-framtid--kunskap-och-innovation-for-sverige.pdf

[3] Utbildningsdepartementet (2024). Forskning och innovation för framtid, nyfikenhet och nytta. Proposition 2024/25:60. https://www.regeringen.se/regeringens-politik/forsknings--och-innovationspropositionen-2024/

develop a specific ERA Action Plan, enforcing the actors-oriented approach. While not originally selected, Sweden implemented several activities related to ERA Action 7 as well.

Table 2 Commitment to ERA Actions

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

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

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)

Sweden is committed to enabling open sharing of knowledge and the re-use of research outputs. The research policy direction has evolved in the last two research policy bills, aligning with European initiatives such as the EOSC. The **2020 research policy bill** established that all scientific publications from publicly funded research must be made openly available starting in 2021, with the transition fully implemented by 2026. In the **2024 Research and Innovation Bill**, the government is driving advancements in open science.[4] In August 2024, the government assigned the Swedish Research Council (Vetenskapsrådet, VR)[5] to develop a **proposal for the advancement of Sweden's e-infrastructure** for research, with a final report due by June 2025.[6] Moreover, **VR's 2024 Annual Report** highlights progress in the research community in establishing strategic directions and integrating open access into research processes and incentive systems.[7]

The **national guidelines for promoting open science**, by the **National Library of Sweden** from January 2024 offer a strategic framework while emphasising national coordination as essential.[8] The Swedish academic community and universities[9], led by **Sveriges**

[4] Utbildningsdepartementet (2024). Forskning och innovation för framtid, nyfikenhet och nytta. Proposition 2024/25:60. https://www.regeringen.se/regeringens-politik/forsknings--och-innovationspropositionen-2024/

[5] The Swedish Research Council and the National Library of Sweden have existing coordination tasks concerning open access.

[6] Utbildningsdepartementet (2024). Forskning och innovation för framtid, nyfikenhet och nytta. Proposition 2024/25:60. https://www.regeringen.se/regeringens-politik/forsknings--och-innovationspropositionen-2024/

[7] Vetenskapsrådet (2024). Öppen tillgång till forskningsdata 2024. https://www.vr.se/download/18.1b96f42f1900fd8751519d1e/1719403078367/%C3%96ppen%20tillg%C3%A5ng%20till%20forskningsdata%20VR%202024.pdf

[8] Kungliga biblioteket (2024). Rapport om nationella riktlinjer för öppen vetenskap. file:///C:/Users/Malin/Downloads/Rapportomnationellariktlinjerforoppenvetenskap%20(4).pdf

[9] Also tasked by the government with developing the national work on open science.

universitets och högskoleförbund (SUHF), has adopted a national roadmap for open science.[10]

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

By 2024, as part of Sweden's effort advancing the reform of research assessment systems, 33 Swedish universities are members of the Coalition for **Advancing Research Assessment (CoARA)**, an international initiative focused on improving research assessment practices. This marks an increase of 13 members since April 2023.[11]

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

The 2024 research and innovation bill underscores the importance of career paths that promote excellence. Strategic talent acquisition and the promotion of the Assistant Professor (*biträdande lektor*) role are seen as critical for fostering excellence. Studies by the Swedish Higher Education Authority (UKÄ) confirm that former *biträdande lektorer* achieve a faster transition to professorship compared to peers. University departments have been tasked with meeting specific targets for appointing assistant professors, yet recent assessments show that universities are still working to meet these goals. In response, reforms have been implemented to expand eligibility criteria for *biträdande lektor* positions. To address the declining number of Swedish citizens earning a doctoral degree by the age of 30, initiatives such as **national research schools, industry partnerships** and **opportunities for combined positions** in academia and other sectors aim to enhance attractive research careers and mobility.[12]

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

The government's objective for 2030 is for women to comprise 50 percent of newly recruited professors[13]. By 2023, the share of women among research and teaching staff reached 48 percent. Among professors, women represented 33 percent – a notable improvement from 24 percent in 2012, making it the category with the most significant shift. Women lecturers comprised 49 percent of their category in 2023. For merit-based positions, women made up 45 percent.[14]

ERA Action 7) Upgrade EU guidance for better knowledge valorisation

Sweden supports ERA Action 7 through several key initiatives. Universities run **Innovationskontor** that help researchers commercialise results, offering support with intellectual property, business development, and networking. **University holding companies** enable early-stage investment and commercialization of research. Vinnova provides verifieringsmedel **(verification funds)** to test the societal or market potential of research outcomes. Additionally, universities are encouraged to strengthen IP strategies and provide training for researchers. A new

[10] SUHF (2022). National Roadmap for Open Science. https://staging.suhf.se/app/uploads/2022/09/National-Roadmap-for-Open-Science-Recommendation-2021-1-Rev.-June-2022-Ref.-SU-850-0005-17.pdf
[11] https://coara.eu/agreement/signatories/?category%5B0%5D=sweden#signatories
[12] Utbildningsdepartementet (2023). Forskning, frihet, framtid – kunskap och innovation för Sverige. Proposition 2020/21:60. https://www.regeringen.se/contentassets/da8732af87a14b689658dadcfb2d3777/forskning-frihet-framtid--kunskap-och-innovation-for-sverige.pdf
[13] Utbildningsdepartementet (2024). Forskning och innovation för framtid, nyfikenhet och nytta. Proposition 2024/25:60. https://www.regeringen.se/regeringens-politik/forsknings--och-innovationspropositionen-2024/
[14] Utbildningsdepartementet (2024). Forskning och innovation för framtid, nyfikenhet och nytta. Proposition 2024/25:60. https://www.regeringen.se/regeringens-politik/forsknings--och-innovationspropositionen-2024/

innovation office for the cultural and creative sectors is also being established to broaden valorisation efforts beyond traditional tech fields.

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

Reinforced by the 2024 bill, Sweden remains committed to the policy direction regarding long lasting investments in advanced research infrastructure such as SciLifeLab, MAX IV, and ESS. Efforts are underway to enhance research infrastructure accessibility for public and private sectors. Priorities include biobanks, agricultural and forestry research centers, and digital resources like the Swedish Twin Registry. For instance, since the last reporting period, the **government's proposition for the long-term regulation of research databases** (2024) aims to secure research databases as critical assets for high-quality research. Additionally, Sweden **leverages AI by tasking the Swedish Research Council with coordinating its integration** and adopting European Research Area Forum guidelines for responsible AI use, fostering progression among research stakeholders.

ERA Action 9) Promote a positive environment and level playing field for international cooperation based on reciprocity

The 2024 research bill prioritises internationalisation, amongst excellence and innovation. In November 2023, the government adopted a **strategy for Sweden's foreign trade, investments, and global competitiveness.** A key objective is to establish or expand partnerships with strategic countries in collaboration with Team Sweden[15]. Furthermore, in 2023, the Swedish government commissioned two key projects to balance global engagement with national security, with deliverables in 2024. The first project involves **national guidelines to manage secure and transparent international collaborations across institutions**. The second establishes a national support functio**n** that will provide tools and guidance, coordinating with security agencies and monitoring international trends.[16]

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

In general, Sweden acknowledges the need for proactive measures in funding calls and applicant support[17]. Agencies will develop a national action plan to boost participation in the research framework programme and Euratom's programs. The focus will be on improving Sweden's success rates in European Research Council and Marie Skłodowska-Curie Actions and pillar 2 and 3 actions through enhanced application support, co-funding for additional costs, and strengthening merit assessments for leadership roles in EU projects.[18]

[15] A network of agencies and companies promoting Swedish exports and investments.

[16] Universitets- och högskolerådet (2024). Nationell stödfunktion för ansvarsfull internationalisering - Slutrapportering av ett regeringsuppdrag. https://www.regeringen.se/contentassets/38934c61f3a2407fb3b1b448594bbeac/nationell-stodfunktion-for-ansvarsfull-internationalisering.pdf

[17] Utbildningsdepartementet (2023). Slutbetänkande av Forskningsfinansieringsutredningen. Ny myndighetsstruktur för finansiering av forskning och innovation. SOU 2023:19. https://www.regeringen.se/rattsliga-dokument/statens-offentliga-utredningar/2023/05/sou-202319/

[18] These actions are also highlighted in the 2024 research bill. Utbildningsdepartementet (2024). Forskning och innovation för framtid, nyfikenhet och nytta. Proposition 2024/25:60. https://www.regeringen.se/regeringens-politik/forsknings--och-innovationspropositionen-2024/

ERA Action 11) An ERA for green transformation

Several initiatives have been launched and extended during the reporting period. For instance, the **Circular Bioeconomy Research and Innovation Programme** focuses on sustainable use of forest biomass. Additionally, the **National Climate Research Programme** extension supports research on emission reduction strategies, climate adaptation, and fostering sector-wide efforts to achieve net-zero emissions and societal resilience.

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

To drive digital transformation and the green transition the **Advanced Digitalisation Programme**[19] is a public-private initiative fostering innovation in AI and communications by uniting academia, industry, and government to drive technological advancement and sustainability. By 2025, over 300 projects were granted funding though the program, with a total investment of SEK 3.766 million, involving more than 700 unique actors, 80 percent of which were from the industry.[20]

ERA Action 14) Bring Science closer to citizens

Sweden brings science closer to citizens by investing in research that meets real societal needs – such as healthcare, education, and public safety – outlined in the 2024 research bill. A key initiative is the expansion of **national research schools (forskarskolor)**, which foster collaboration among doctoral students, researchers, and universities. These schools often include mobility opportunities, enabling students to gain experience abroad or in industry, further enhancing research relevance and quality. By linking education with research, especially in areas like teacher training and primary care, Sweden ensures scientific knowledge directly benefits society.[21]

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

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

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

Sweden has not committed to the ERA Action under this priority area.

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

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

[19] https://www.avanceraddigitalisering.se/insatser-och-projekt/projekten-berattar/

[20] Projects funded through Advanced Digitalisation in 2024 can be found in the Vinnova project database: https://www.vinnova.se/sok-finansiering/projekt/?aoName=&current=&numberofhits=&q=Avancerad%20digitalisering&skip=310&status=beslutat&take=320

[21] Utbildningsdepartementet (2024). Forskning och innovation för framtid, nyfikenhet och nytta. Proposition 2024/25:60. https://www.regeringen.se/regeringens-politik/forsknings--och-innovationspropositionen-2024/

ERA Priority 1 is addressed through a range of initiatives focusing on **ERA Actions 1, 3, 4, 5, 7, 8 and 9**. The implementation of these activities is largely on track and supported by investments, however not explicitly dedicated in a national ERA Action plan but distinguished in the two latest research and innovation bills.

Several Swedish reforms and interventions focus on the topic of **Open Science**, and related areas. For instance, ERA Dashboard Indicator 6 has shown positive progress over the past five years, despite a slight decline between 2022 and 2023. ERA Dashboard Indicator 7, which tracks open access research datasets, stands out among the dashboard indicators, showing significant growth since 2019 before levelling off in 2021. Nevertheless, it remains significantly above the EU27 average. However, please note that that newest data for 2023 is not available, making it difficult to assess recent progress based on the indicator. As for ERA Dashboard Indicator 8, the number of repositories in 2023 (30) aligns with other Nordic countries like Denmark (27) and Norway (33) but is significantly higher than Finland's total of 14.

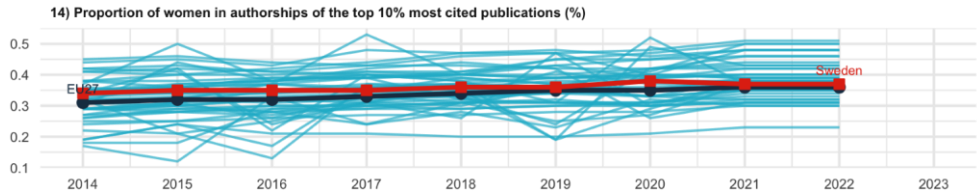
Excellence is a central theme in Sweden's research policy, as emphasised in the 2024 research bill, which underscores the importance of **attractive research careers** and mobility in research and innovation. ERA Dashboard Indicators 17 and 18 reveal that Sweden is performing well in comparison the EU27 average, with consistent performance over the past five years.

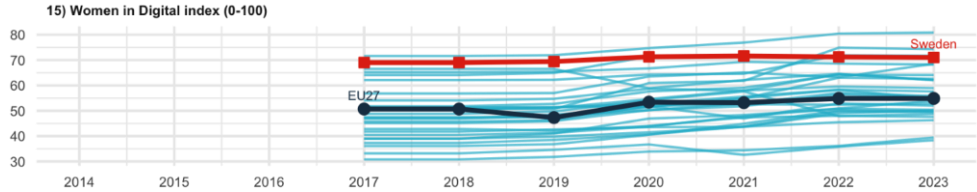
In the area of **knowledge valorisation**, several dashboard indicators show that Sweden is performing consistently well, often significantly exceeding the EU27 average in terms of collaboration between business and academia. Notably, Sweden surpasses the EU27 average in ERA Dashboard Indicator 19 and outperforms it in ERA Dashboard Indicators 21 and 23. Similarly, ERA Dashboard Indicator 24 reflects strong and stable performance, with a marked increase since 2020. This growth positions Sweden as a frontrunner in the integration of researchers within the business sector relative to overall industrial employment.

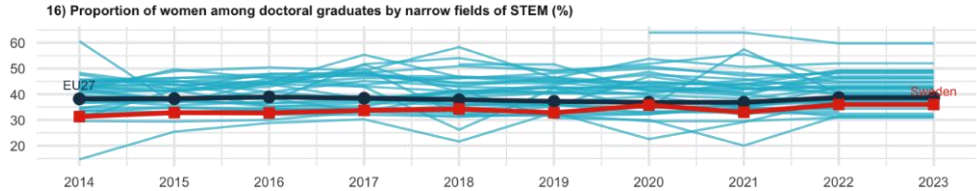
In the area of **international cooperation**, also highlighted in the latest research bill, ERA Dashboard Indicators 30 and 31 (focused on international co-publications and co-inventors) show that Sweden outperforms the EU27 average. Notably, for ERA Dashboard Indicator 30, Sweden stands out with a significantly higher score, surpassing Denmark, the leading innovation nation. Sweden's dedication to investing in advanced **research infrastructure** is reflected in ERA Dashboard Indicator 11, which highlights the country's participation in a higher-than-average number of European Research Infrastructures (RIs) compared to other Member States and Associated Countries.

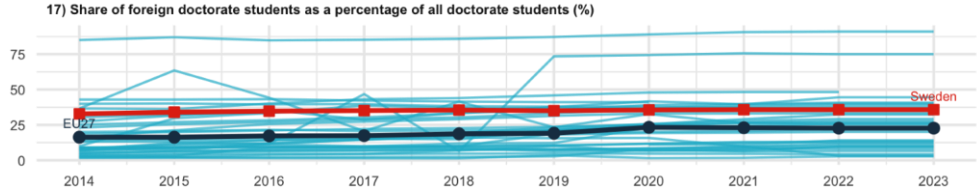
Overall, Sweden demonstrates consistent yet relatively flat development in the ERA Priority 1 areas, as reflected in the dashboard indicators, with performance often exceeding the average (with a few notable exceptions, such as ERA Dashboard Indicators 7 and 30 as mentioned above). However, in the area of **gender equality**, ERA Dashboard Indicators 12, 13, and 14 have been close to the EU average in recent years. In contrast, Sweden performs significantly above the EU average for ERA Dashboard Indicator 15, "Women in Digital". On the other hand, ERA Dashboard Indicator 16, also related to Action 5 (Women among doctoral graduates in STEM), shows Sweden ranking well below the EU27 average. Hence, the ERA Dashboard Indicators suggest a need for further and continuous actions to speed up progress in Action 5.

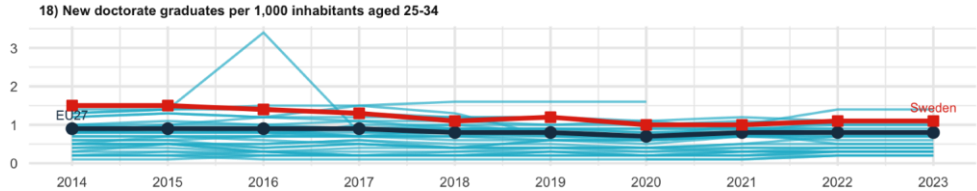
Figure 3-1 Indicators for ERA Priority 1

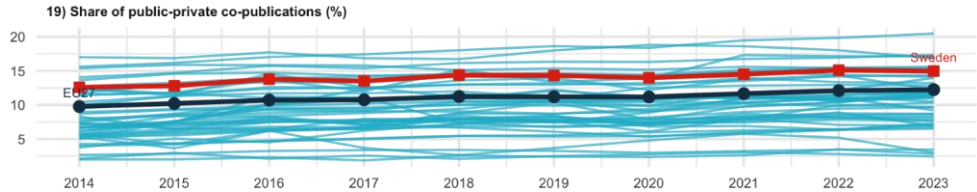

14) Proportion of women in authorships of the top 10% most cited publications (%)
0.5
0.4
0.3
0.2
0.1
EU27
Sweden
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


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

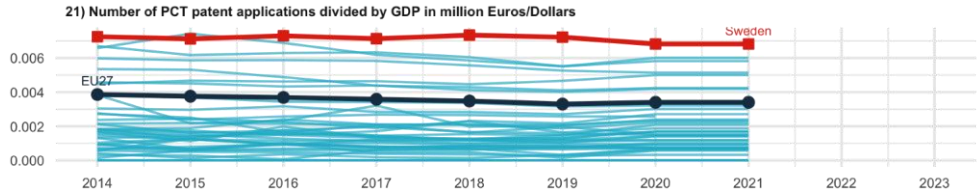

16) Proportion of women among doctoral graduates by narrow fields of STEM (%)
60
50
40
30
20
EU27
Sweden
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


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

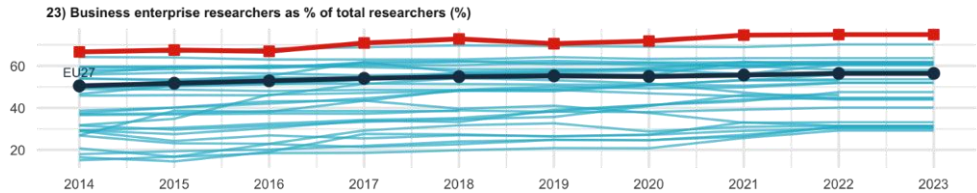

18) New doctorate graduates per 1,000 inhabitants aged 25-34
3
2
1
0
EU27
Sweden
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

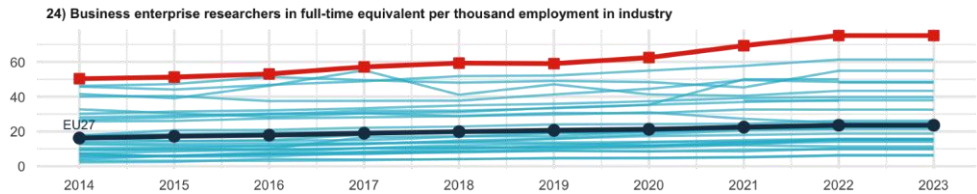

19) Share of public-private co-publications (%)
20
15
10
5
EU27
Sweden
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

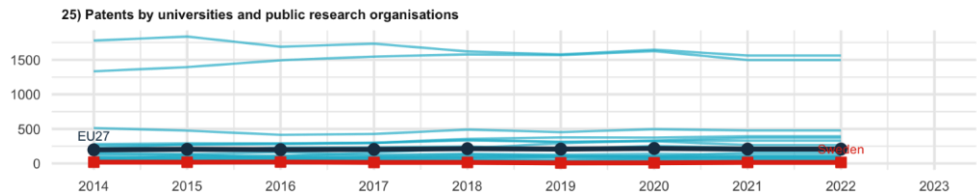

20) Best practice examples and methodologies for knowledge valorisation - 2023
30
20
10
0
10
25
2
2
6
4
1
7
9
11
2
1
7
13
3
4
3
1
21
1
11
1
1
1
6
13
6
6
Austria
Belgium
Croatia
Cyprus
Czechia
Denmark
Estonia
EU27
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands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

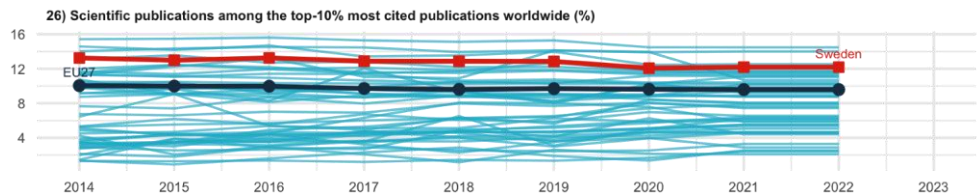

21) Number of PCT patent applications divided by GDP in million Euros/Dollars
Sweden
EU27
0.006
0.004
0.002
0.000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

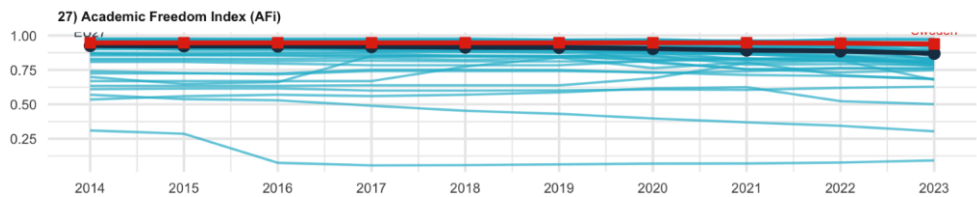

22) Share of innovating firms collaborating with HEI/PRO out of all innovative firms
40
30
20
10
EU27
Sweden
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

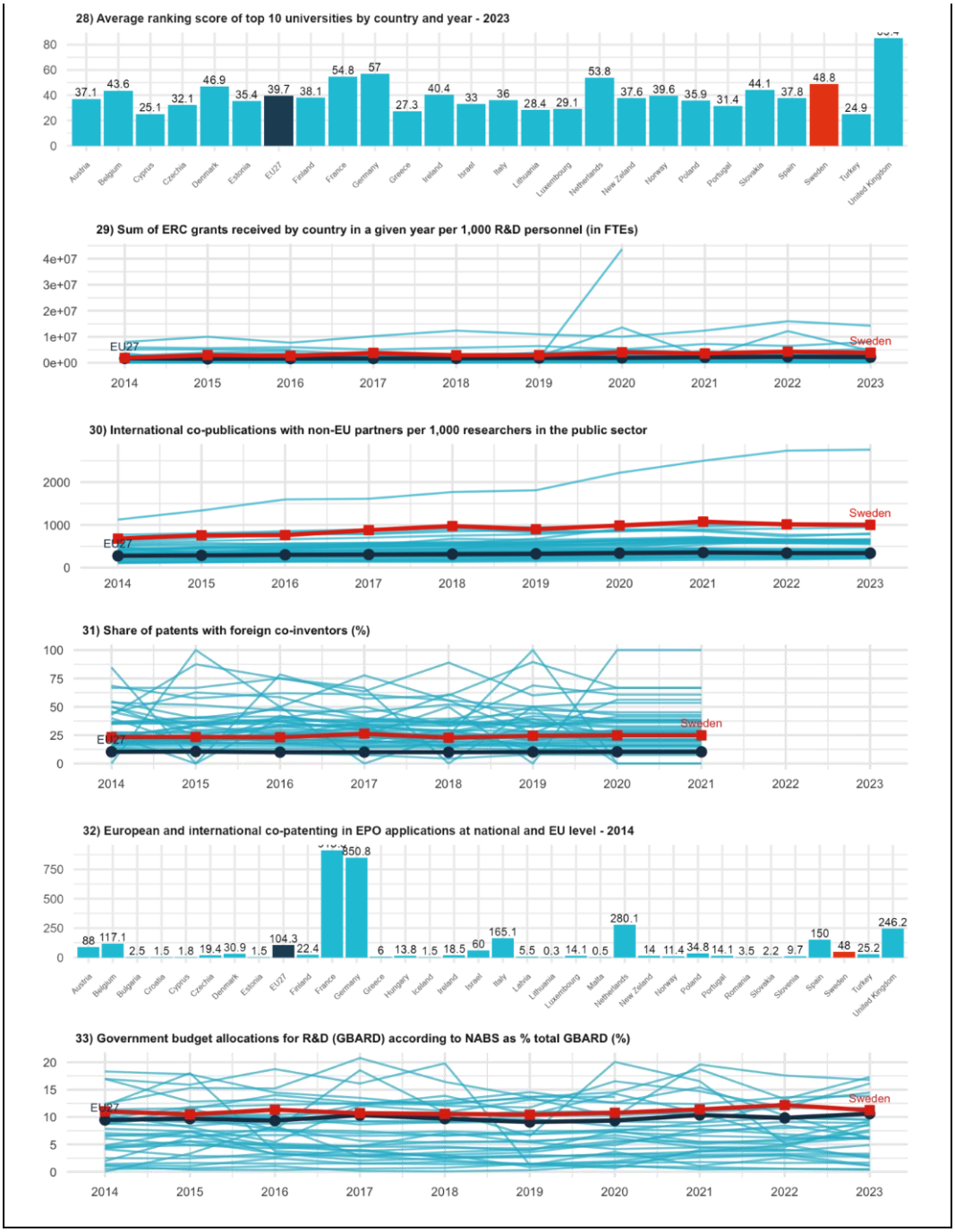

23) Business enterprise researchers as % of total researchers (%)
60
40
20
EU27
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023


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
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
Sweden
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



Source: see Annex 1

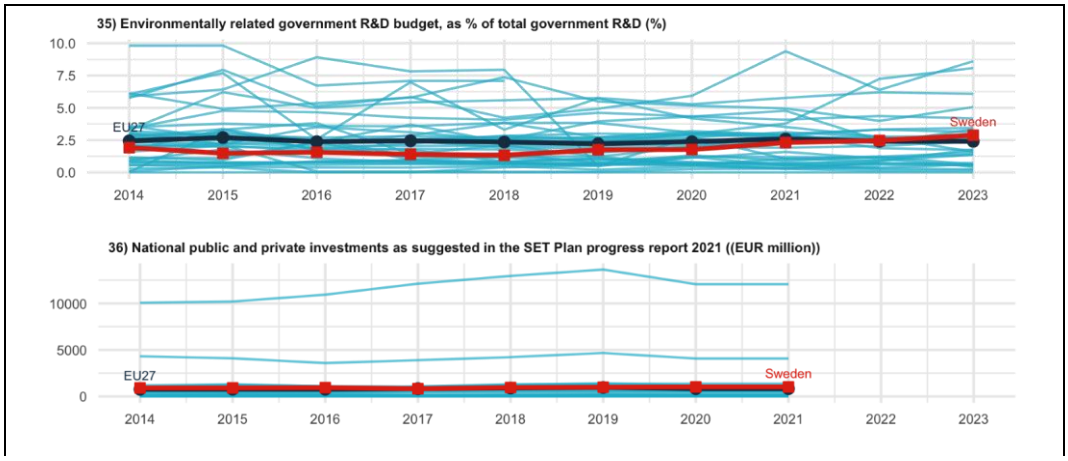
ERA Priority 2 is addressed through **ERA Actions 10, 11, 12 and 14**. As internationalisation is a key focus in the most recent government bill, Sweden aims to enhance its participation in EU R&I programs, contributing to Action 10 and the **EU's R&I missions and partnerships**. For instance, ERA Dashboard Indicator 43 reflects Sweden's average spending on widening countries, which is comparable to the EU27 average.

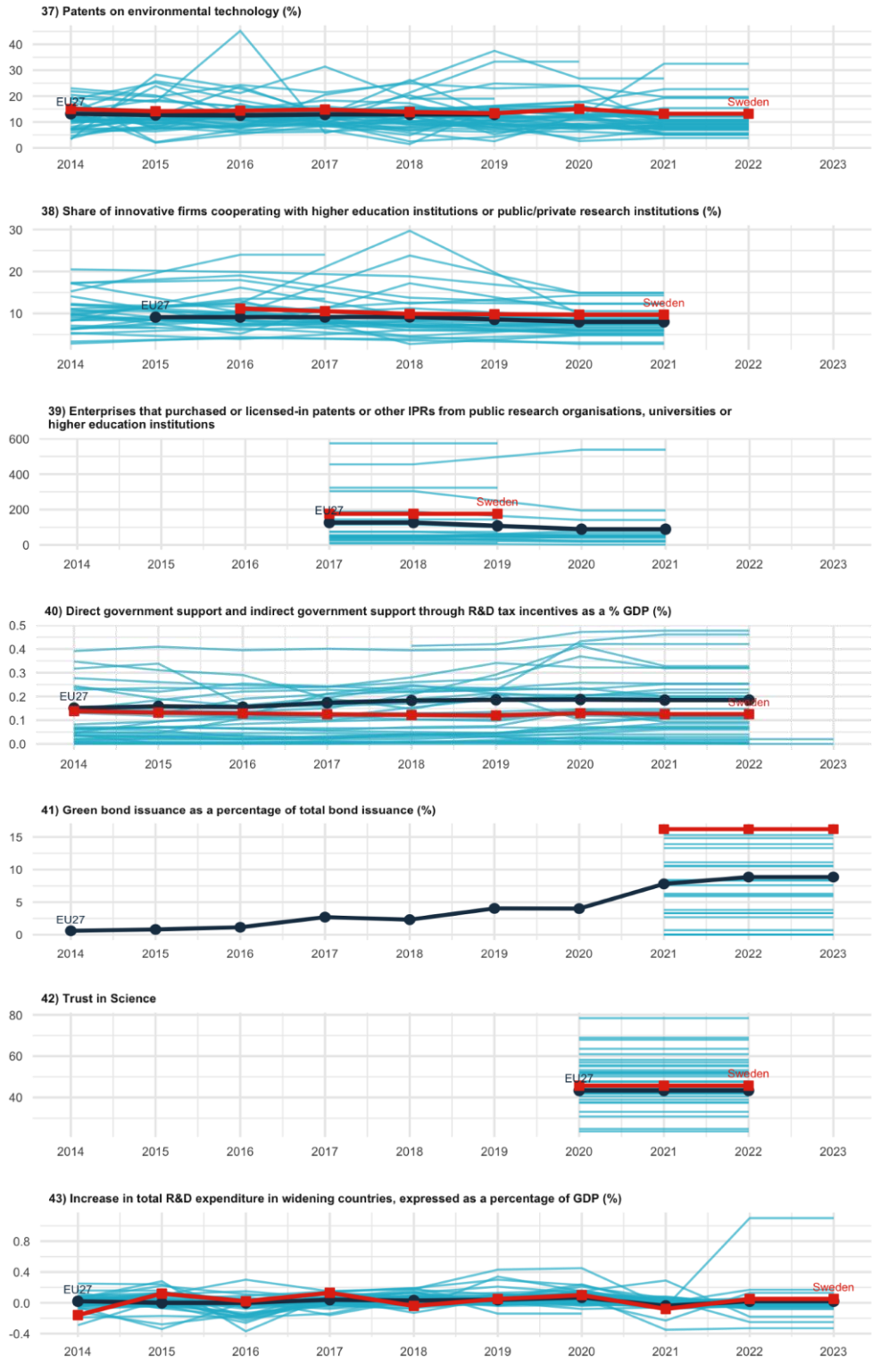
Societal relevance is central to Sweden's research policy, driving excellence and highlighting the need to allocate resources for addressing societal challenges. This includes investments in programs focused on the environment, climate, and bioeconomy, essential for advancing the **green transformation** (Action 11) both within and outside Sweden. For ERA Dashboard Indicator 35, which focuses on the environmentally related government R&D budget as a share of the total R&D budget, Sweden has generally been slightly below or around the EU average over the past decade. This is highlighting a potential area for improvement in environmentally related spending. Regarding ERA Dashboard Indicator 36, Sweden's spending, as outlined in the SET Plan progress report, aligns with the EU27 average. Nevertheless, Sweden excels as a provider of green bond issuance (ERA Dashboard Indicator 41), performing well above the EU average over the past two years, although data points for former years are unavailable.

ERA Action 12 emphasises accelerating the **green and digital transition** of Europe's key industrial ecosystems. Swedish initiatives include investments in advanced digitalisation and AI. Morover, Sweden aims to increase its participation in EU programs such as Horizon Europe to foster international collaboration and technological development. Action 12 is reflected in ERA Dashboard Indicator 37, where Sweden consistently performed slightly above the EU27 average in patents for environmental technology between 2014 and 2018. However, the absence of recent EU27 data limits the ability to assess Sweden's current standing or progress in this area.

Apart from the positive exceptions noted for indictors related to Actions 10 and 11, Sweden's overall performance aligns with the EU27 average in ERA Priority 2. However, Sweden has consistently lagged behind the EU average for the past decade in ERA Dashboard Indicator 40, which measures governmental support through R&D tax incentives. In the area of **Science Closer to Citizens**, recent data is missing for some key indicators, such as 38 and 39. Nevertheless, the Trust in Science indicator (2022) shows that Sweden is on par with the EU27 average.

Figure 3-2 Indicators for ERA Priority 2

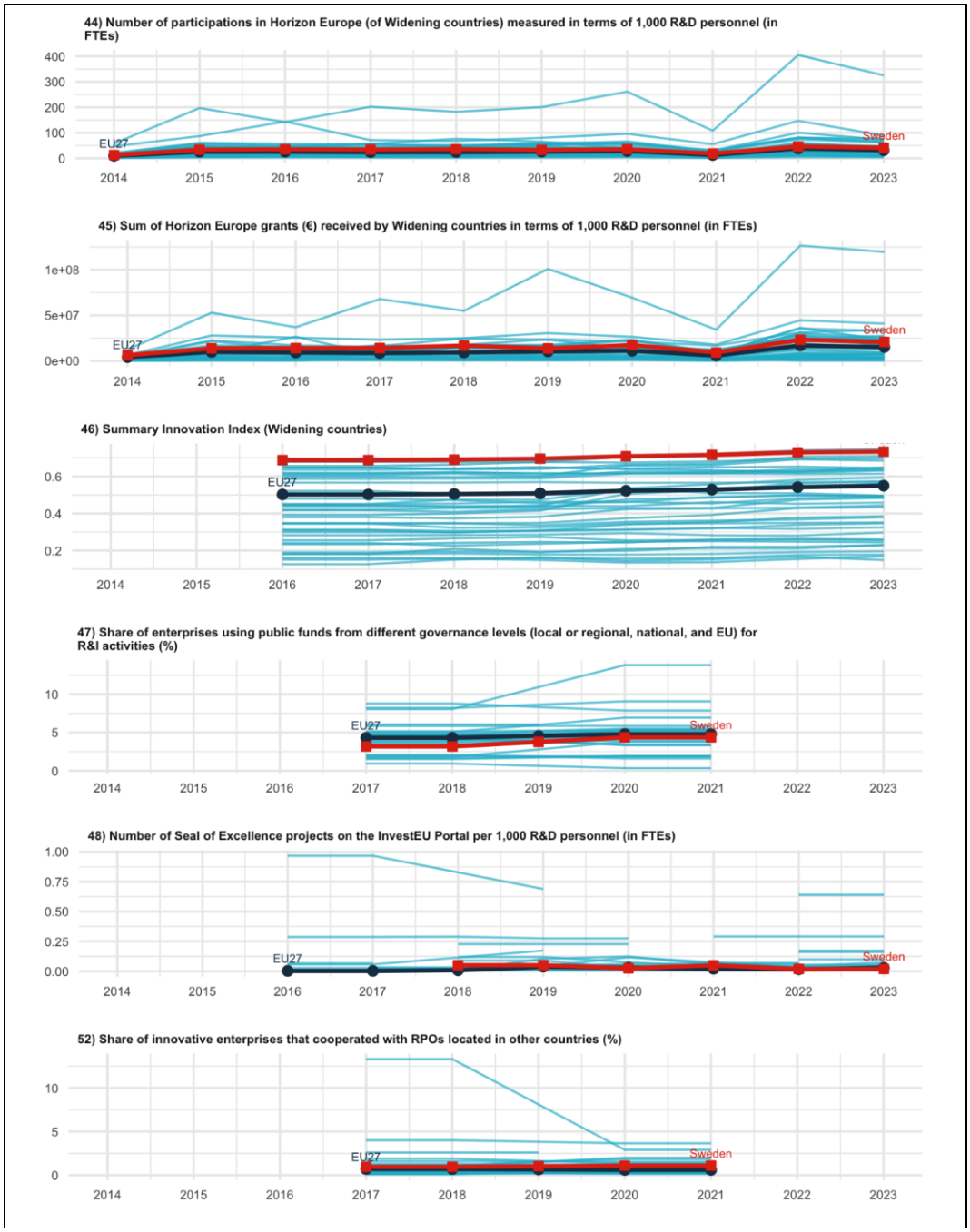


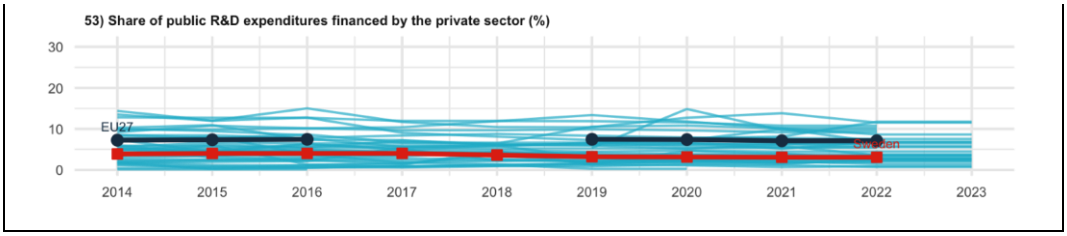


Source: see Annex 1

ERA Priority 3 - Sweden has not committed to any of the ERA Actions under this priority area. The indicators for this area display a broadly positive to neutral trend.

Figure 3-3 Indicators for ERA Priority 3

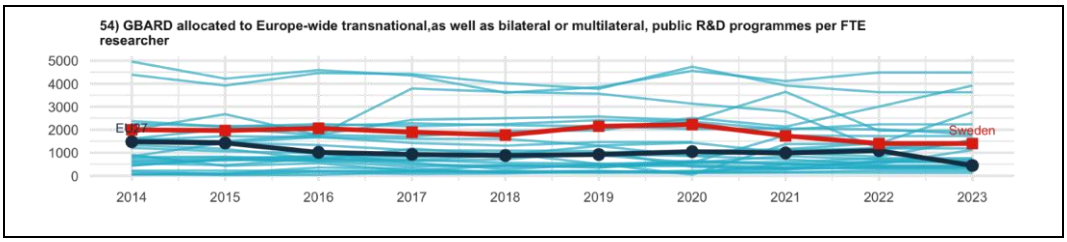




Source: see Annex 1

Sweden has not committed to any of the ERA Actions under this **ERA Priority 4**.

Figure 3-4 Indicators for ERA Priority 4



Source: see Annex 1

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

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

As noted above, Sweden's R&I policies and investments demonstrate overall strong alignment with the ERA actions, reflecting the long-established direction of its research policies as seen in the two last research bills. However, this alignment is not explicitly outlined in an ERA Action Plan. Sweden aims to position itself among the leading nations in R&D expenditure as a percentage of GDP. As highlighted in the 2024 research bill, achieving this ambition will require significant investment, alongside an intensified focus on **excellence**, **internationalization**, and **innovation**. The national implementation of ERA contributes to various fields of activities in these areas.

The 2024 research bill emphasizes the importance of career pathways that foster excellence. Reforms in strategic talent acquisition and the promotion of the Assistant Professor (biträdande lektor) role are identified as pivotal for advancing excellence, aligning with **ERA Priority Area 1**, Action 4. This focus is reinforced by ERA Dashboard Indicators 17, 18, and 19, which highlight Sweden's strong and consistent performance in career development and mobility, surpassing the EU27 average. ERA Dashboard Indicator 22 reveals that the number of PCT applications relative to GDP significantly exceeds the average between 2014-2021 (data for the period 2022-2023 is unavailable).

Moreover, the 2024 research bill reaffirms Sweden’s commitment to open science. Policies such as the mandatory open access requirement for publicly funded research outputs and the full transition to open access by 2026 highlight this focus. Complementary initiatives, including the development of national guidelines by the National Library of Sweden, emphasize

national coordination and alignment with FAIR principles. These initiatives are well-aligned with ERA Action 1. Sweden's integration of open science policies with European initiatives like EOSC further strengthens its alignment with ERA priorities. Progress in open science is evident in ERA Dashboard Indicator 6, which has shown positive trends over the past five years, despite a slight decline between 2022 and 2023. Similarly, ERA Dashboard Indicator 7 demonstrates growth in open access to research datasets since 2019, positioning Sweden well above the EU27 average.

Moreover, the 2024 research bill underscores the importance of long-term investments in advanced research infrastructure, emphasizing their pivotal role in ensuring excellence in research and innovation. Facilities such as SciLifeLab, MAX IV, and ESS are cornerstones of Sweden's strategy. Recent reforms aim to enhance the accessibility of these infrastructures for both public and private sectors, with a focus on biobanks, agricultural and forestry research centres, and digital resources like the Swedish Twin Registry. Additionally, the government's proposition for the long-term regulation of research databases in 2024 seeks to safeguard these critical assets for high-quality research. This national emphasis aligns with ERA Action 8 on research infrastructures. Sweden's commitment is evident in ERA Dashboard Indicator 11, which shows that the country participates in an above-average number of European Research Infrastructures (RIs) among Member States and Associated Countries. However, its participation remains lower compared to nations like Belgium and Bulgaria.

As for **Priority Area 2**, national policy emphasizes the pivotal role of international collaboration in advancing research excellence and driving innovation. The 2024 research bill emphasizes strategies to expand global partnerships and strengthen Sweden's presence in EU research initiatives. Key projects include guidelines for secure and transparent international collaborations and support functions to coordinate with security agencies. This focus on international engagement aligns with ERA Action 10. Sweden's measures to increase participation in Horizon Europe and other EU R&I missions underscore the synergy between national policies and ERA objectives. ERA Dashboard Indicator 30, which measures international co-publications shows significantly higher scores than the EU27 average. Similarly, ERA Dashboard Indicator 31 reflects Sweden's relative strong performance in fostering international co-inventor collaborations.

While the ERA Dashboard Indicators highlight strengths in research careers, open science, and international collaboration, challenges persist in accelerating progress in the areas of green transition and gender equality.

5. Conclusions

Sweden is an innovation leader firmly committed to the European Research Area (ERA) and has implemented eleven of the 17 ERA Actions, with a focus on ERA Priorities 1 and 2. The country employs a bottom-up, actors-oriented approach to ERA implementation, emphasizing collaboration among key stakeholders to set priorities. While Sweden has not developed a formal ERA Action Plan, its research and innovation (R&I) policies and investments align closely with ERA objectives, as reflected in the long-term strategic direction outlined in the 2020 and 2024 research bills.

As demonstrated by the initiatives and performance detailed above, Sweden demonstrates overall stable and consistent progress towards their prioritized goals of the ERA. Sweden's strong focus on areas such as open science, research careers, and international collaboration aligns well with ERA priorities, as reflected in steady, high performance in relevant ERA Dashboard indicators. Furthermore, the continued national investments in research and innovation, as emphasized in the 2024 research bill, further solidify the country's commitment

to advancing these objectives, paving the way for the achievement of the ERA goals. However, to fully unlock this potential, further efforts are required to drive progress in green transition initiatives and tackle the ongoing gender equality gaps in certain areas.

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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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