ERA Scoreboard and Dashboard 2024

Methodology Report

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ERA Scoreboard and Dashboard 2024 - Methodology Report

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ERA Scoreboard and Dashboard 2024

Methodology Report

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Table of Contents

1. Introduction

This methodology report presents the set of indicators collected for the ERA Scoreboard and the ERA Dashboard 2024.

In Section 2, a list of indicators will be provided for both the ERA Scoreboard and the ERA Dashboard with details on the main sources, the rationale and the addressed ERA priority and sub-priority.

In Section 3, the description of the data collection and the methodology applied to build each indicator will be presented. As several indicators are contained in both the ERA Scoreboard and the ERA Dashboard, they will be presented in the ERA Scoreboard only and a reference to it will be contained in the ERA Dashboard list.

In Section 4, the imputation rules implemented are described, alongside with examples.

The Annex contains the list of country abbreviations used in the text.

The final datasets are accesible and available in the ERA Scoreboard and Dashboard 2024 replication package.[1]

2. List of indicators

2.1. ERA Scoreboard 2024

The ERA Scoreboard 2024 is comprised of 19 indicators.

ID	ERA Scoreboard Indicator	ERA Pact Sub-priorities	Source	Rationale
General indicators				
1	Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP	R&D Investment	Eurostat, OECD, UNESCO UIS	Monitors progress towards the 3% R&D target
2	Researchers (in full-time equivalent) per million inhabitants	R&D Investment	Eurostat, UNESCO UIS	Direct measure of the number of R&D workers per 1 million people. It is identical to UN SDG indicator 9.5.2
3	Expenditure on R&D procurement as a percentage of GDP	R&D Investment	EC/European Innovation Procurement Observatory	Indicator measures the total country expenditure on public procurement of R&D services; to be aggregated for EU-level

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ID	ERA Scoreboard Indicator	ERA Pact Sub-priorities	Source	Rationale
ERA Priority Area: Deepening a truly functioning internal market for knowledge			
4	Share of publications available in open access (green, gold and diamond)	Open Science	OpenAIRE	Measures share of publications available in open access
5	Share of national public R&D expenditure committed to European research infrastructures	Research Infrastructures	ESFRI	Measures the share of national public R&D expenditure for European research infrastructures
6	Share of women in grade A positions in higher education institutes	Gender Equality	Women in Science database – She Figures reports	Tracks progress in improvements of women in the highest levels of academia
7	Share of foreign doctorate students as a percentage of all doctorate students	Researchers' careers and mobility	Eurostat	Measures the share of foreign doctorate students in all doctorate students of a country indicating the international mobility of PhD students.
8	Share of innovating firms collaborating with HEI/PRO out of all innovative firms	Knowledge Valorisation	Eurostat: Community Innovation Survey	Measures the collaboration and thus exchange of knowledge between the business and public sector
9	Number of scientific publications among the top-10% most cited publications worldwide as a percentage of all publications	Scientific leadership	EC (ScienceMetrix)	Measure for the efficiency of the research system, as highly cited publications are assumed to be of higher quality. There could be a bias towards small or English-speaking countries given the coverage of Scopus' publication data
10	International co-publications with non-EU partners per 1.000 researchers in the public sector	Global engagement	EC (ScienceMetrix), Eurostat, OECD	International scientific co-publications are a proxy for the quality of scientific research as collaboration increases scientific productivity Non-EU is defined as non-Member States
ERA Priority Area: Taking up together the green transition and digital transformation and other challenges with impact on society, and increasing society's participation in the ERA			
11	Environmentally related government R&D budget as percentage of total government R&D	Challenge-based ERA actions	Eurostat, OECD Green Growth Indicators	Monitors progress on research activities supporting the EU's Green deal

ID	ERA Scoreboard Indicator	ERA Pact Sub-priorities	Source	Rationale
12	Innovative enterprises that co-operated on R&D and other innovation activities with universities and higher education institutions	Synergies with education and the European Skills Agenda	Eurostat CIS	Measures the number of innovative enterprises that co-operated on R&D and other innovation activities with universities and other higher education institutions
13	Direct government support and indirect government support through R&D tax incentives as a percentage of GDP	Synergies with sectorial policies and industrial policy	Eurostat for data on direct support OECD R&D Tax Incentive Database for data on indirect support	Public financing of R&D can take two forms: Direct funding for R&D through instruments such as grants and public procurement, and Indirect support through the tax system. Over time, more and more countries have introduced R&D tax incentives
14	Research on social innovation (publications on 'social innovation' or 'social entrepreneurship')	Active citizen and societal engagement in R&I	OpenAIRE	Captures contributions from public and private sector R&I towards solving societal problems

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

ID	ERA Scoreboard Indicator	ERA Pact Sub-priorities	Source	Rationale
15	Increase in total R&D expenditure, expressed as a percentage of GDP	More investments and reforms in countries and regions with lower R&I performance	Eurostat	Monitors widening countries' share in EU research activities *Widening countries include Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, Slovenia*
16	Number of Seal of Excellence projects published on the InvestEU Portal per 1.000 R&D personnel (in FTEs)	Synergies between Union, national and regional funding programmes	InvestEU Portal, Eurostat	The Seal of Excellence is a quality label awarded by the Commission to proposals which have been assessed in a call for proposals under a Union instrument and are deemed to comply with the quality requirements of that Union instrument but could not be funded. These projects are judged to deserve funding and might receive support from other Union or national sources of funding. The Seal of Excellence certificate recognises the value of the proposal and helps other funding bodies take advantage of the high-quality Commission evaluation process

ID	ERA Scoreboard Indicator	ERA Pact Sub-priorities	Source	Rationale
17	Number of collaboration networks of RPOs in Widening countries with other EU countries	Increased collab links and excellence-based integration of research-performing org. from countriesregions with lower R&I perf.	Horizon Dashboard	Monitors the number of collaborations between Widening countries and other EU countries *Widening countries include Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, Slovenia*

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

ID	ERA Scoreboard Indicator	ERA Pact Sub-priorities	Source	Rationale
18	Share of public R&D expenditures financed by the private sector	Support to prioritise and secure long-term R&I investments and policy reforms	Eurostat, OECD	Measures public-private co-operation in research. The willingness of the private sector to co-fund public R&I projects could be a proxy for how closely companies work with universities and public research organisations
19	Government budget allocations for R&D (GBARD) allocated to Europe-wide transnational, as well as bilateral or multilateral, public R&D programmes per FTE researcher	Coordination of R&I investments	Eurostat	Reflects the emphasis on collaboration and sharing of experiences in R&D across borders, whether national, regional or organisational. Europe-wide transnational public R&D programmes include R&D programmes that involve the flow of funds across borders for research purposes, as well as those that include transnational cooperation. Bilateral or multilateral public R&D programmes comprise non-European Commission funded R&D research conducted jointly by at least two Member State governments, involving either the flow of funds or transnational cooperation. This indicator is a good proxy to measure government support to transnational collaborations across the ERA

2.2. ERA Dashboard 2024

The ERA Dashboard 2024 is comprised of 53 indicators.

ID	ERA Dashboard Indicator	ERA Pact sub-priorities	Source
General indicators			
1	Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP		Eurostat, OECD, UNESCO UIS

ID	ERA Dashboard Indicator	ERA Pact sub-priorities	Source
2	Government Budget Allocations for R&D (GBARD) as share of GDP		Eurostat, OECD
3	Researchers (in full-time equivalent) per million inhabitants		Eurostat, UNESCO UIS
4	Business Enterprise expenditure on R&D (BERD) as a percentage of GDP		Eurostat, OECD
5	Expenditure on R&D procurement as a percentage of GDP		EC/European Innovation Procurement Observatory
ERA Priority 1: Deepening a truly functioning internal market for knowledge			
6	Share of publications available in open access	Open Science	OpenAIRE
7	Number of open-access research datasets by country	Open Science	OpenAIRE
8	Number of repositories by country	Open Science	re3data.org
9	Country investments in EOSC and Open Science (in ranges of investment[2])	Open Science	EOSC Observatory
10	Share of national public R&D expenditure committed to European research infrastructures	Research infrastructures	ESFRI
11	Number of European research infrastructures in which a Member State or an Associated Country participates (financially contributes to operations).	Research infrastructures	ESFRI Ris Portfolio
12	Share of women in grade A positions in HEIs	Gender equality, equal opportunities for all and inclusiveness	Women in Science database, She Figures reports
13	Proportion of papers with mixed gender authorship, 2000–2020	Gender equality, equal opportunities for all and inclusiveness	EC (Scopus (Elsevier))
14	Proportion of women in authorships of the top 10% most cited publications, 2000–2018	Gender equality, equal opportunities for all and inclusiveness	EC (Scopus (Elsevier))

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[2] Five ranges of investment: < 1 M; 1 - 5 M; 5 - 10 M; 10 – 20; > 20 M. Total amount of financial investments in EOSC and Open Science in 2021 (in millions of Euros) is available only in aggregated (countries combined) presentation.

ID	ERA Dashboard Indicator	ERA Pact sub-priorities	Source
15	Women in Digital Index	Gender equality, equal opportunities for all and inclusiveness	Eurostat (Women in Digital Scoreboard)
16	Proportion (%) of women among doctoral graduates by narrow fields of Science, Technology, Engineering and Mathematics (STEM)	Gender equality, equal opportunities for all and inclusiveness	Eurostat
17	Share of foreign doctorate students as a percentage of all doctorate students	Researchers' careers and mobility and research assessment and reward systems	Eurostat
18	New doctorate graduates per 1.000 inhabitants aged 25-34	Researchers' careers and mobility and research assessment and reward systems	Eurostat
19	Share of public-private co-publications	Knowledge valorisation	EC (Scopus (Elsevier))
20	Best practice examples and methodologies for knowledge valorisation	Knowledge valorisation	Knowledge Valorisation Platform
21	Number of PCT patent applications divided by GDP in million Euros	Knowledge valorisation	OECD, Eurostat, World Bank
22	Share of innovating firms collaborating with higher education institutions or public/private research institutions	Knowledge valorisation	Eurostat CIS
23	Business enterprise researchers as % of national, total	Knowledge valorisation	OECD Main STI
24	Business enterprise researchers in full-time equivalent per thousand employment in industry	Knowledge valorisation	OECD Main STI
25	Patents by universities and public research organisations	Knowledge valorisation	EPO PATSTAT (Fraunhofer ISI)
26	Number of scientific publications among the top-10% most cited publications worldwide as a percentage of all publications	Scientific leadership	EC (Scopus (Elsevier))
27	Academic Freedom Index (AFi)	Scientific leadership	V-Dem database
28	Average ranking score of top 10 universities by country and year	Scientific leadership	QS World University Rankings
29	Sum of ERC grants received by country in a given	Scientific leadership	ERC Dashboard,

ID	ERA Dashboard Indicator	ERA Pact sub-priorities	Source
	year per 1.000 R&D personnel (in FTEs)		Eurostat
30	International co-publications with non-EU partners per 1.000 researchers in the public sector	Global engagement	EC (Scopus (Elsevier)), Eurostat and OECD
31	Share of patents with foreign co-inventors	Global engagement	OECD
32	European and international co-patenting in EPO applications at national and EU level	Global engagement	Eurostat
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			
33	Government budget allocations for R&D (GBARD) according to NABS as share of total GBARD	Challenge-based ERA actions	Eurostat
34	Environmentally related government R&D budget, percentage of total government R&D	Challenge-based ERA actions	Eurostat, OECD (Green Growth Indicators Database)
35	National public and private R&I investments in energy technologies	Challenge-based ERA actions	SETIS research and innovation data
36	Patents on environmental technology	Challenge-based ERA actions	OECD
37	Share of products and/or processes by innovative firms cooperating with higher education institutions or public/private research institutions	Synergies with education and the European Skills Agenda	Eurostat CIS
38	Purchased or licensed-in patents or other IPRs from public research organisations, universities or higher education institutions	Synergies with education and the European Skills Agenda	Eurostat CIS
39	Direct and indirect government support through R&D tax incentives as a percentage of GDP	Synergies with sectoral policies and industrial policy, in order to boost innovation ecosystems	Eurostat, OECD
40	Green bond issuance as a percentage of total bond issuance	Synergies with sectoral policies and industrial policy, in order to boost innovation ecosystems	Eurostat
41	Trust in science	An active citizen and societal engagement in R&I	GESIS (Eurobarometer)

ID	ERA Dashboard Indicator	ERA Pact sub-priorities	Source
		in all its dimensions	
ERA Priority 3: Enhancing access to research and innovation excellence across the Union and enhancing interconnections between innovation ecosystems across the Union			
42	Increase in total R&D expenditure in Widening countries expressed as a percentage of GDP	More investments and reforms in countries and regions with lower R&I performance	Eurostat
43	Number of participations in Horizon Europe (of widening countries) measured in terms of 1.000 R&D personnel (in FTEs)	More investments and reforms in countries and regions with lower R&I performance	Horizon Dashboard, Eurostat
44	Sum of Horizon Europe grants received by (widening) country in a given year measured in terms of 1.000 R&D personnel (in FTEs)	More investments and reforms in countries and regions with lower R&I performance	Horizon Dashboard, Eurostat
45	Summary Innovation Index (widening countries)	More investments and reforms in countries and regions with lower R&I performance	European Innovation Scoreboard
46	Share of enterprises using public funds from different governance levels (local or regional, national, and EU) for R&I activities	Synergies between Union, national and regional funding programmes	Eurostat CIS
47	Number of Seal of Excellence projects published on the InvestEU Portal per 1.000 R&D personnel (in FTEs)	Synergies between Union, national and regional funding programmes	InvestEU Portal, Eurostat
48	Number of collaboration networks of RPOs in widening countries with other EU countries	Increased collaborative links and the excellence-based integration of research-performing organisations from countries and outermost regions with lower R&I performance into European scientific networks and innovation ecosystems, more balanced "brain circulation" within the ERA, appropriate skills and training for	Horizon Dashboard

ID	ERA Dashboard Indicator	ERA Pact sub-priorities	Source
		enhancing access to excellence	
49	Average number of partners from non-widening countries per institution from a widening country participating in the Horizon programme each year	Increased collaborative links and the excellence-based integration of research-performing organisations from countries and outermost regions with lower R&I performance into European scientific networks and innovation ecosystems, more balanced "brain circulation" within the ERA, appropriate skills and training for enhancing access to excellence	Horizon Dashboard
50	Share of patents registered by a widening country together with partners from other EU countries	Increased collaborative links and the excellence-based integration of research-performing organisations from countries and outermost regions with lower R&I performance into European scientific networks and innovation ecosystems, more balanced "brain circulation" within the ERA, appropriate skills and training for enhancing access to excellence	OECD
51	Share of enterprises that cooperated with RPOs located in other countries	Increased collaborative links and the excellence-based integration of research-performing organisations from countries and outermost regions with lower R&I performance into European scientific networks and	Eurostat CIS

ID	ERA Dashboard Indicator	ERA Pact sub-priorities	Source
		innovation ecosystems, more balanced "brain circulation" within the ERA, appropriate skills and training for enhancing access to excellence	
ERA Priority 4: Advancing concerted research and innovation investments and reforms			
52	Share of public R&D expenditures financed by the private sector	Support to prioritise and secure long-term R&I investments and policy reforms	Eurostat, OECD
53	Government budget allocations for R&D (GBARD) allocated to Europe-wide transnational, bilateral or multilateral public R&D programmes per FTE researcher	Coordination of R&I investments	Eurostat

3. Description of indicators

This chapter provides the definitions, data sources, and calculation rules for each of the indicators used in the ERA Scoreboard and ERA Dashboard 2024 respectively.

3.1. ERA Scoreboard 2024

Below the tables for each indicator in the ERA Scoreboard 2024, where data sources, calculation rules, countries covered and years imputed are reported.

Indicator #1	Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP
Data source 1	Eurostat Data Browser
Dataset	GERD by sector of performance (rd_e_gerdtot)
Last update	17/03/2024
Time	2010-2022
Unit of measure	Percentage of GDP
Countries covered	EU27, MS, Iceland, Norway, Serbia, Türkiye, United Kingdom

Indicator #1	Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP
Data source 2	OECD Data Explorer
Dataset	Main Science and Technology Indicators (MSTI database) - Gross Domestic Expenditure by R&D
Time	2010-2021
Last update	29/03/2024
Unit of measure	Percentage of GDP
Countries covered	Israel
Data source 3	UNESCO UIS
Dataset	Science, technology and Innovation - Research and experimental Development (R&D) – GERD as percentage of GDP
Last update	20/09/2024
Time	2010-2022
Unit of measure	Percentage of GDP
Countries covered	Armenia, Bosnia and Herzegovina, Georgia, Moldova, North Macedonia, Tunisia, Ukraine, Montenegro, Morocco, New Zealand
Missing countries	Albania, Kosovo
Imputed years by country	2023 (EU27, MS, IS, NO, AM, BA,GE, MD, MK,RS, TR, UA), 2022 (IL, NZ), 2020 (UK, TN, ME, NZ), 2018 (NZ), 2016 (NZ), 2014 (NZ), 2012 (IS, GE, ME, NZ), 2011 (BA, MA), 2010 (IS, ME, NZ)
Dashboard indicator	#1

Indicator #2	Researchers (in full-time equivalent) per million inhabitants
Numerator	
Data source 1	Eurostat Data Browser
Dataset	R&D personnel by sector of performance, professional position and sex (rd_p_persocc)
Last update	17/03/2024

Indicator #2	Researchers (in full-time equivalent) per million inhabitants
Time	2010-2022
Unit of measure	FTE, sex as TOTAL, sector of performance as TOTAL, professional position as RSE
Denominator	
Data source	Eurostat
Dataset	Population on 1 January by age and sex (demo_pjan)
Time	2010-2023
Last update	04/09/2024
Unit of measure	Number, sex and age as TOTAL
Calculation rule	Researchers divided by population, multiplied by 1,000,000
Countries covered	EU27, MS, North Macedonia, Norway, Serbia, Türkiye, United Kingdom
Data source 2	UNESCO UIS
Dataset	Science, technology and Innovation - Research and experimental Development (R&D) – Researchers per million inhabitants (FTE)
Last update	20/09/2024
Time	2010-2022
Unit of measure	Number
Countries covered	Bosnia and Herzegovina, Georgia, Moldova, Tunisia, Ukraine, Iceland, Montenegro, Morocco, New Zealand
Missing countries	Albania, Israel, Kosovo
Imputed years by country	2023 (EU27, MS, MK, NO, RS, TR, BA, GE, MD, TN, UA, AM), 2022 (IS, NZ), 2021 (MK), 2020 (UK, MK, NZ), 2018 (NZ), 2017 (MA), 2016 (NZ), 2015 (MA), 2014 (IS, NZ), 2013 (LT, MA), 2012 (GE, IS, ME, NZ), 2011 (BA), 2010 (EL, IS, ME, NZ)
Dashboard indicator	#3

Indicator #3	Expenditure on total innovation procurement (R&D and

	innovative solutions) as percentageof GDP
Data source	EC/European Innovation Procurement Observatory Sources of the data provided: -Procurements above EU treshold: Tenders Electronic Daily (TED) -Procurements below EU treshold: National public procurement data portals (publicly available data); private providers of public procurement data (purchased data) -Total country public procurement expenditure (excl. defence): Eurostat
Indicator	Innovation procurement expenditure
Time period	2022
Countries covered	EU27, MS, Norway, United Kingdom
Sub-indicators	#3.1, #3.2, #3.3
#3.1	Expenditure on innovative solutions procurement as percentage of GDP
Numerator	Total Public Procurement of Innovative Solutions expenditure (After verifications/updates by Lieve) (in EUR)
#3.2	Expenditure on R&D procurement as percentage of GDP
Numerator	Total R&D procurement expenditure (in EUR)
#3.3	Expenditure on total innovation procurement (R&D and innovative solutions) as percentage of GDP
Numerator	Total innovation procurement expenditure (= Total R&D procurement expenditure + Total Public Procurement of Innovative Solutions expenditure)
Denominator	
Data source 1	Eurostat Data Browser
Dataset	GDP and main components (output, expenditure and income) – GDP at market prices
Time	2022
Last update	19/10/2024

Unit of measure	Current prices, million euro
Countries covered	EU27, MS, Norway
Data source 2	OECD Data Explorer
Dataset	[Annual GDP and components - expenditure approach](#)
Time	2022
Last update	23/10/2024
Unit of measure	US dollars, PPP
Countries covered	United Kingdom
Calculation rule	Numerator/Denominator*100
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Kosovo, Iceland, Israel, Moldova, North Macedonia, Serbia, Tunisia, Türkiye, Ukraine, Montenegro, Morocco, New Zealand.
Imputed years by country	2021 and 2022 (EU27, MS, NO, UK)
Notes	Information from the data provider:

Innovation Procurement includes both public procurements of research and development, public procurements of innovative solutions (i.e. innovative supplies, works of services) and public procurements that purchase a combination of R&D and innovative solutions. The definitions of R&D and innovation are the definitions from the EU public procurement directives which correspond to the OECD Frascati manual definitions:

- R&D includes both fundamental research, industrial research and experimental development.

- Innovation includes both transformative innovation (totally new or significantly improved products, services, processes, organisational or marketing methods) and incremental innovation (combinations or new use of existing products, services, processes, organisational or marketing methods that results in significant improvements). A procurement is purchasing an innovative solution when the public procurer acts as an early adopter for that innovative solution. Early adopters refer to the first 20% of customers on the market that are buying a new or significantly improved solution.

The indicator covers procurements of all possible sizes (both procurements above and below the EU public procurement thresholds).

	The indicator covers procurements made by all types of public procurers that active across all 10 domains of public sector activity defined in the EU public procurement directives, except for defence procurement (due to confidentiality reasons of this data). These 10 domains cover: public administration (e-gov), health and social care, public transport, energy, environment, water, education, culture, postal/packaging services, security.
Dashboard indicator	#5

Indicator #4	**Share of publications available in open access (green, gold and diamond)**
Data source	OpenAIRE
Dataset	OpenAIRE Graph Dataset – <u>Publication</u>
Last update	26/07/2024
Time	2010-2023
Unit of measure	Percentage
Calculation rule	Number of publications in open access/total number of publications*100
Countries covered	EU27 (calculated manually as mean of MS), MS, AC (except missing countries)
Missing countries	Greece, United Kingdom
Imputed years by country	2024 (EU27, MS, AC, except missing countries), 2021 (AT), 2018 (GE), 2016 (AM), 2012 (AT, NZ), 2010 (FI)
Dashboard indicator	#6

Indicator #5	**Share of national public R&D expenditure committed to European research infrastructures**
Data source	ESFRI
Dataset	Data obtained by the **ESFRI** as "Annual participation fees and host contributions about European Research Infrastructures, with at least three MS contributing, in the year 2022. For participation fees, in-cash contributions are reported, while host premium contributions can be either in cash or in-kind."

Indicator #5	Share of national public R&D expenditure committed to European research infrastructures
Last update	2022
Time	2022
Unit of measure	Share
Calculation rule	Fees and host contributions/ R&D (HES+GOV)
Countries covered	Belgium, Bulgaria, Spain, France, Greece, Hungary, Iceland, Italy, Latvia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Slovakia
Missing countries	EU27, Austria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, Germany, Ireland, Lithuania, Luxembourg, Sweden, Associated Countries (except Iceland and Norway)
Imputed years by country	2023 and 2021 (BE, BG, ES, FR, EL, HU, IT, LV, MT, NL, PL, PT, RO, SI, SK, IS, NO)
Dashboard indicator	#10

Indicator #6	Share of women in grade A positions in higher education institutes
Data source	[Women in Science database](), DG Research and Innovation – She Figures reports ([2015](), [2018](), [2021]())
Dataset	Proportion of women of Grade A in academic staff
Last update	2018
Time	2010-2018, 2019 for Croatia
Unit of measure	proportion
Calculation rule	Main data source: WiD, first choice: data for academic staff. When not available filled with data for researchers. For the remaining missing data, added from single reports where available.
Detailed description	Academic staff (BG, HR, FR, DE, EL, IE, IT, LV, LT, LU, MT, NL, PL, RO, SK, SI, ES, SE, IS, IL); Researchers (AT, BE, CY, DK, FI, HU, PT, BA, NO). For 2010 data added from SF2015 (BE, IE, FR, LU, AT, PL, SI, SK, FI, SE, NO). For 2016 data added from SF2018 (CZ, EE, FR, HR, AT, SI, UK, IS). For 2018 data added from SF2021 (EU27, EL, FR, HR, CY, LV, LU, AT, UK, IS, TR).

Indicator #6	Share of women in grade A positions in higher education institutes
Countries covered	EU27 (calculated manually), Austria (2010, 2011, 2013, 2015:2018), Belgium, Bulgaria, Croatia (2014, 2016, 2017, 2018, 2019), Cyprus, Czechia (2016), Denmark, Estonia (2016), Finland, France (2010, 2012, 2015,:2018), Germany. Greece (2012, 2013, 2015:2018), Hungary, Ireland (2010, 2013:2018), Italy, Latvia (no 2017), Lithuania (2016:2018), Luxembourg (2016, 2018), Malta(2014, 2016, 2018), Netherlands, Poland (no 2011), Portugal, Romania, Slovakia (2010, 2012, 2013, 2016, 2018), Slovenia (2010, 2013:2016, 2018), Spain, Sweden (2010, 2011, 2013, 2015, 2017, 2018), Bosnia and Herzegovina (2016:2018), Iceland (2010:2012, 2016, 2018), Israel (2014: 2018), Norway, Türkiye (2017), United Kingdom (2016, 2018)
Calcualtion rule for EU27	Mean of the values avaiable in the MS per year.
Missing countries	Albania, Armenia, Georgia, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Serbia, Tunisia, Ukraine.
Imputed years by country	2020 (HR), 2019 (EU27, MS (except HR, EE, CZ), BA, IS, IL, NO, TR, UK), 2017 (CZ, EE, LV, LU, MT, SK, SI, IS, TR, UK), 2016 (SE), 2015 (HR, CZ, EE, LT, MT, BA, UK), 2014 (AT, EL, SE), 2013 (CZ, MT, IL), 2012 (AT, SE), 2011 (FR, EL, PL, SK)
Dashboard indicator	#12

Indicator #7	Share of foreign doctorate students as a percentage of all doctorate students
Data source	Eurostat Data Browser
Dataset	Share of mobile students from abroad enrolled by education level, sex and country of origin (educ_uoe_mobs03)
Last update	20/09/2024
Time	2013-2022
Unit of measure	Percentage, sex as TOTAL
ISCED 2011 – International Standard Classification of Education	Doctoral or equivalent level

Indicator #7	Share of foreign doctorate students as a percentage of all doctorate students
Geopolitical entity partner	World total except for reporting country
Countries covered	EU27, MS, Albania, Iceland, Norway, North Macedonia, Serbia, Türkiye, United Kingdom.
Missing countries	Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Morocco, Montenegro, New Zealand, Tunisia, Ukraine
Imputed years by country	2023 (EU27, MS (except NL), AL, IS, MK, NO, RS, TR), 2022 (NL), 2020 (AL, UK), 2014 (EU27, EE, EL, UK), 2013 (DE), 2012 (MS (except EL, DE), IS, MK, NO, RS, TR)
Dashboard indicator	#17

Indicator #8	Share of innovating firms collaborating with HEI/PRO out of all innovative firms
Data source	Eurostat Data Browser
Dataset	Eurostat Community Innovation Survey - CIS
Time	2010, 2012, 2014, 2016, 2018, 2020
Survey round	CIS 2010
Numerator	
Dataset	Types of co-operation partner for product and process innovation (2010) - inn_cis7_coop
Last update	21/03/2019
Statistical classification	Innovation core activities (Com. Reg. 1450/2004) - (B-M71_INN)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06), Enterprises co-operating with Government or public research institutes (C07)
Unit of measure	Number
Size class	Total
Denominator	

Indicator #8	Share of innovating firms collaborating with HEI/PRO out of all innovative firms
Dataset	Enterprises by type of innovation (2010) - inn_cis7_type
Last update	12/03/2014
Statistical classification	Innovation core activities (Com. Reg. 1450/2004) – (B-M71_INN)
Innovation indicator	Innovative enterprises (including enterprises with abandoned/suspended or on-going innovation activities) (INNO)
Unit of measure	Number
Size class	Total
Missing countries	Greece, Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine, United Kingdom
Survey round	CIS 2012
Numerator	
Dataset	Types of co-operation of the enterprises by NACE Rev.2 activity and size class (2012) - inn_cis8_coop
Last update	19/03/2019
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Type of innovator	Product and/or process innovative enterprises, regardless of organisational or marketing innovation (including enterprises with abandoned/suspended or on-going innovation activities) (INNOACT)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06), Enterprises co-operating with clients or customers frin the public sector (C032)
Unit of measure	Number
Size class	Total
Denominator	
Dataset	Basic economic information on the enterprises by NACE Rev. 2 activity and size class (2012) - inn_cis8_bas

Indicator #8	Share of innovating firms collaborating with HEI/PRO out of all innovative firms
Last update	08/01/2020
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Type of innovation	Innovative enterprises (including enterprises with abandoned/suspended or on-going innovation activities) (INNO)
Innovation indicator	Total number of enterprises in the population in 2012 (ENT_POPU12)
Unit of measure	Number
Size class	Total
Missing countries	Netherlands, Poland, Romania, Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2014
Numerator	
Dataset	Types of co-operation of the enterprises by NACE Rev.2 activity and size class (2014) - inn_cis9_coop
Last update	23/04/2021
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Type of innovator	Product and/or process innovative enterprises, regardless of organisational or marketing innovation (including enterprises with abandoned/suspended or on-going innovation activities) (INNOACT)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06), Enterprises co-operating with Government, public or private research institutes (C09)
Unit of measure	Number
Size class	Total
Denominator	
Dataset	Basic economic information on the enterprises by NACE Rev. 2

Indicator #8	Share of innovating firms collaborating with HEI/PRO out of all innovative firms
	activity and size class (2014) - inn_cis9_bas
Last update	23/04/2021
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Type of innovation	Innovative enterprises (including enterprises with abandoned/suspended or on-going innovation activities) (INNO)
Innovation indicator	Total number of enterprises in the population in 2014 (ENT_POPU14)
Unit of measure	Number
Size class	Total
Missing countries	Sweden, Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2016
Numerator	
Dataset	Product and/or process innovative enterprises engaged in co-operation by co-operation partner, NACE Rev. 2 activity and size class (2016)- inn_cis10_coop
Last update	03/07/2019
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Cooperation partners	Universities and other higher education institutions (UNIV), Government and public research institutes (PUB_GOV_RI)
Unit of measure	Number
Size class	Total
Denominator	
Dataset	Basic economic information on the enterprises by NACE Rev. 2 activity and size class (2016) - inn_cis10_bas
Last update	03/07/2019

Indicator #8	Share of innovating firms collaborating with HEI/PRO out of all innovative firms
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterprise	Innovative active enterprises (INN)
Innovation indicator	Enterprises in the population in 2016 (ENT16)
Unit of measure	Number
Size class	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2018
Numerator	
Dataset	Enterprises that co-operated on R&D and other innovation activities with other enterprises or organisations, by kind and location of co-operation partner, NACE Rev. 2 activity and size class (2018) - inn_cis11_coop
Last update	11/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterpises	Innovation active enterprises (INN)
Cooperation partners	Universities and other higher education institutions (UNIV), Government, public or private research institutes (GOV_RI)
Unit of measure	Number
Size class	Total
Location of partners	Total
Denominator	
Dataset	Enterprises, employed persons and turnover by type of enterprise, NACE Rev. 2 activity and size class (2018) - inn_cis11_bas
Last update	11/07/2023

Indicator #8	Share of innovating firms collaborating with HEI/PRO out of all innovative firms
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterprise	Innovative active enterprises (INN)
Innovation indicator	Enterprises in the population in 2018 (ENT18)
Unit of measure	Number
Size class	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Survey round	CIS 2020
Numerator	
Dataset	Innovative enterprises that co-operated on R&D and other innovation activities with other enterprises or organisations, by kind and location of co-operation partner, NACE Rev. 2 activity and size class (2020) - inn_cis12_coop
Last update	12/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Cooperation partners	Universities and other higher education institutions (UNIV), Government, public or private research institutes (GOV_RI)
Unit of measure	Number
Size class	Total
Location of partners	Total
Denominator	
Dataset	Enterprises, employed persons and turnover by type of enterprise, NACE Rev. 2 activity and size class (2020) - inn_cis12_bas
Last update	12/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)

Indicator #8	Share of innovating firms collaborating with HEI/PRO out of all innovative firms
Enterprise	Innovative active enterprises (INN)
Innovation indicator	Enterprises in the population in 2020 (ENT20)
Unit of measure	Number
Size class	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Calculation rule	Share of each type of actity (HEI/Denominator; PRO/denominator) (Max value between the two shares) plus 0.5 multiplied by the (min value of the two shares), all multiplied by 100
Calculation rule for EU27	Sum of the numerator values divided by the sum of the denominator values
Imputed years by country	2021 (EU27, MS, NO, TR), 2019 (EU27, MS, IS, NO, TR), 2017 (EU27, MS, NO, RS, TR, UK), 2015 (EU27, MS (except SE), MK, NO, RS, TR, UK), 2013 (EU27, MS (except PL, NL, RO, SE), MK, NO, RS, TR, UK), 2011 (EU27, MS (except PL, NL, RO), NO, RS, TR, UK)
Dashboard indicator	#22

Indicator #9	Number of scientific publications among the top-10% most cited publications worldwide as a percentage of all publications
Data source	ScienceMetrix (provided by the European Commission)
Dataset	% Highly Cited Publications (Top 10%)
Last update	04/09/2024
Time	2010-2021
Unit of measure	Percentage
Countries covered	EU27, MS, AC
Imputed years by	2022 (EU27, MS, AC)

Indicator #9	Number of scientific publications among the top-10% most cited publications worldwide as a percentage of all publications
country	
Dashboard indicator	#26

Indicator #10	International co-publications with non-EU partners per 1,000 researchers in the public sector
Numerator	
Data source	ScienceMetrix (provided by the European Commission)
Dataset	Total Co-Publications with Non-EU27 Countries
Last update	04/09/2024
Time	2010-2023
Unit of measure	Number
Countries covered	EU27, MS, AC
Denominator	
Data source 1	Eurostat Data Browser
Dataset	R&D personnel by sector of performance, professional position and sex (rd_p_persocc)
Last update	17/03/2024
Time	2010-2022
Unit of measure	FTE, sex as TOTAL, sector of performance as GOV and HES, professional position as RSE
Countries covered	EU27, MS, Bosnia and Herzegovina, Montenegro, North Macedonia, Norway, Serbia, Türkiye, United Kingdom
Data source 2	OECD Data Explorer
Dataset	R&D personel by sector of performance and major field of R&D
Last update	04/09/2024
Time	2010-2022

Indicator #10	International co-publications with non-EU partners per 1,000 researchers in the public sector
Unit of measure	FTE, sex as TOTAL, sector of performance as TOTAL, professional position as RSE
Imputed years by country for researchers	2023 for all countries available, plus Greece (2010), Bosnia and Herzegovina (2010, 2011, 2015, 2016, 2017, 2018, 2022), Montenegro (2010, 2012, 2020, 2021, 2022), North Macedonia (2021), United Kingdom (2020, 2021, 2022), Iceland (2010, 2012, 2020, 2015, 2016, 2019, 2020, 2022).
Countries covered	Iceland
Calculation rule	Numebr of publications divided by the number of researchers, multiplied by 1000
Missing countries	Albania, Armenia, Georgia, Israel, Kosovo, Moldova, Morocco, New Zealand, Tunisia, Ukraine
Imputed years by country	2024 (EU27, MS, BA, IS, ME, MK, NO, RS, TR, UK)
Dashboard indicator	#30

Indicator #11	Environmentally related government R&D budget as percentage of total government R&D
Data source 1	Eurostat Data Browser
Dataset	GBARD by socioeconomic objectives (NABS 2007) (gba_nabsfin07)
Last update	30/01/2024
Time	2010-2023
Unit of measure	Percentage of GBAORD
NABS 2007	Environment (NABS02)
Countries covered	EU27, MS, Iceland, Norway, Serbia, Türkiye, United Kingdom
Data source 2	OECD Data Explorer
Dataset	Green Growth – Environment related government R&D budget
Time	2010-2021

Indicator #11	Environmentally related government R&D budget as percentage of total government R&D
Last update	September 11, 2024
Unit of measure	Percentage of government allocations for R&D
Countries covered	Israel and New Zealand
Missing countries	Albania, Armenia, Georgia, Kosovo, Moldova, Montenegro, Morocco, North Macedonia, Tunisia, Ukraine
Imputed years by country	2024 (EU27, MS, IS, NO, RS, TR), 2022 (BA), 2018 (NZ), 2013 (BA), 2012 (RS), 2011 (PL)
Dashboard indicator	#34

Indicator #12	Innovative enterprises that co-operated on R&D and other innovation activities with universities and higher education institutions
Data source	Eurostat Data Browser
Dataset	Eurostat Community Innovation Survey - CIS
Time	2010, 2012, 2014, 2016, 2018, 2020
Survey round	CIS 2010
Dataset	Types of co-operation partner for product and process innovation (2010) - inn_cis7_coop
Last update	21/03/2019
Statistical classification	Innovation core activities (Com. Reg. 1450/2004) - (B-M71_INN)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06)
Unit of measure	Number
Size class	Total
Missing countries	Greece, Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine, United Kingdom

Indicator #12	Innovative enterprises that co-operated on R&D and other innovation activities with universities and higher education institutions
Survey round	CIS 2012
Dataset	Types of co-operation of the enterprises by NACE Rev.2 activity and size class (2012) - inn_cis8_coop
Last update	19/03/2019
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Type of innovator	Product and/or process innovative enterprises, regardless of organisational or marketing innovation (including enterprises with abandoned/suspended or on-going innovation activities) (INNOACT)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06)
Unit of measure	Number
Size class	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2014
Dataset	Types of co-operation of the enterprises by NACE Rev.2 activity and size class (2014) - inn_cis9_coop
Last update	23/04/2021
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Type of innovator	Product and/or process innovative enterprises, regardless of organisational or marketing innovation (including enterprises with abandoned/suspended or on-going innovation activities) (INNOACT)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06)
Unit of measure	Number
Size class	Total

Indicator #12	Innovative enterprises that co-operated on R&D and other innovation activities with universities and higher education institutions
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2016
Dataset	Product and/or process innovative enterprises engaged in co-operation by co-operation partner, NACE Rev. 2 activity and size class (2016)- inn_cis10_coop
Last update	03/07/2019
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Cooperation partners	Universities and other higher education institutions (UNIV)
Unit of measure	Number
Size class	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2018
Dataset	Enterprises that co-operated on R&D and other innovation activities with other enterprises or organisations, by kind and location of co-operation partner, NACE Rev. 2 activity and size class (2018) - inn_cis11_coop
Last update	11/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterpises	Innovation active enterprises (INN)
Cooperation partners	Universities and other higher education institutions (UNIV)
Unit of measure	Number
Size class	Total

Indicator #12	Innovative enterprises that co-operated on R&D and other innovation activities with universities and higher education institutions
Location of partners	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Survey round	CIS 2020
Dataset	Innovative enterprises that co-operated on R&D and other innovation activities with other enterprises or organisations, by kind and location of co-operation partner, NACE Rev. 2 activity and size class (2020) - inn_cis12_coop
Last update	12/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Cooperation partners	Universities and other higher education institutions (UNIV)
Unit of measure	Number
Size class	Total
Location of partners	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Calculation rule for the EU27	Sum by year of the Member States available. Calculated manually for 2010, 2012, 2014.
Imputed years by country	2021 (EU27, MS, NO, TR), 2019 (EU27, MS, IS, NO, TR), 2017 (EU27, MS, IS, MK, NO, RS, TR, UK), 2015 (EU27, MS, IS, MK, NO, RS, TR, UK), 2013 (EU27, MS, MK, NO, RS, TR, UK), 2011 (EU27, MS, NO, RS, TR, UK)
Notes	For 2010, 2012, 2014 and 2016, R&D activities are not specified or mentioned.

Indicator #13	Direct government support and indirect government support through R&D tax incentives as a percentage of GDP
Data source 1	OECD Data Explorer
Dataset	R&D tax expenditure and direct government funding of BERD – Sum of tax incentive support for business R&D (GTARD) and government-financed BERD
Time	2010-2021
Last update	22/07/2024
Unit of measure	Percentage of GDP
Countries covered	EU27, MS, Iceland, Israel, New Zealand, Norway, Türkiye, United Kingdom
Data source 2	Eurostat Data Browser
Dataset	GERD by sector of performance and source of funds (rd_e_gerdfund)
Last update	17/03/2024
Time	2010-2022
Unit of measure	Percentage of GDP
Source of funds	Government – direct government
Sector of performance	Business enterprise sector
Countries covered	Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia
Notes	Countries covered by Eurostat have only direct government support
Missing countries	Albania, Armenia, Georgia, Kosovo, Moldova, Morocoo, Tunisia, Ukraine
Imputed years by country	2022 (EU27, MS (except DK, RO), IS, IL, NZ, NO, TR, UK, BA), 2021 (DK, RO, MK), 2020 (ME), 2016 (ES, ME), 2014 (LU, MK), 2013 (RO), 2012 (ME), 2011 (BA), 2010 (ME)
Dashboard indicator	#39

Indicator #14	Research on social innovation
Data source	OpenAIRE
Dataset	OpenAIRE Graph Dataset – Publication
Last update	26/07/2024
Time	2010-2024
Unit of measure	Number of publications retrieved by keywords "social innovation", "social entrepreneurship"
Countries covered	EU27 (calculated as mean of MS), MS, North Macedonia, Norway, Serbia, Türkiye, Ukraine
Missing countries	Greece, Romania, Slovakia, United Kingdom, Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Tunisia, United Kingdom
Imputed years by country	2024 (LV, LT, LU. PL, PT, NO, RS, TR, UA), 2023 (BG, CY), 2022 (LU), 2021 (IS, RS), 2020 (EE), 2019 (HU, LT, LU, IS), 2018 (MK), 2017 (RS), 2016 (BG, LU), 2015 (CY, LT, MK), 2014 (EE, LU), 2013 (TR), 2012 (NO), 2011 (IE, LV, PL, SI), 2010 (DK, FI, LT, MT, NO, TR)

Indicator #15	Increase in total R&D expenditure in Widening countries, expressed as a percentage of GDP
For aggregate Widening countries	
Data source 1	Eurostat Data Browser
Dataset	GERD by sector of performance (rd_e_gerdtot)
Last update	17/03/2024
Time	2010-2022
Unit of measure	Millon Euro
Countries covered	Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, Slovenia
Denominator	
Data source 2	Eurostat Data Browser

Indicator #15	Increase in total R&D expenditure in Widening countries, expressed as a percentage of GDP
Denominator	GERD by sector of performance (rd_e_gerdtot)
Last update	17/03/2024
Time	2010-2022
Unit of measure	Percentage of GDP
Countries covered	Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, Slovenia
Calculation rule	Aggregate GERD: Sum GERD in million euros Aggregate GDP: Calculate GDP as GERD in mil/(GERD as pct/100) Aggregate GERD in pct: Aggregate GERD in mil/Aggregate GDP *100 Aggregate indicator: difference between Aggregate GERD in pct in each year and that in previous year
For individual countries	
Data source	Indicator #1 - Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP. See the respective table for the detailed information
Time	2011-2022
Calculation rule	Difference between GERD in pct in each year and that in the previous year
Missing countries	Albania, Kosovo
Imputed years by country	2023 (EU27, MS, AM, BA, GE, IS, MD, MK, NO, RS, TR, UA), 2022 (IL), 2020 (ME, TN, UK), 2013 (GE, IS, ME), 2012 (BA), 2010 (EU27, MS, AM, IL, MD, MK, NO, RS, TN, TR, UA, UK)
Dashboard indicator	#42

Indicator #16	Number of Seal of Excellence projects published on the InvestEU Portal per 1,000 R&D personnel (in FTEs)
Numerator	
Data source	InvestEU Portal (provided by the European Commission)
Dataset	Seal Excellence projects
Last update	2024 (not clear from the website)
Time	2017-2024
Unit of measure	Number
Countries covered	EU27 (calculated manually as sum of MS available by year), MS (except Malta and Slovenia), Norway
Denominator	
Data source 1	Eurostat Data Browser
Dataset	R&D personnel by sector of performance, professional position and sex (rd_p_persocc)
Last update	17/03/2024
Time	2010-2022
Unit of measure	FTE, sex as TOTAL, sector of performance as TOTAL, professional position as TOTAL
Countries covered	EU27, MS (except Malta and Slovenia), Norway
Imputed years by country for Researchers	2023 for all countries available, plus Greece (2010)
Calculation rule	Numebr of projects in each country and year divided by the number of researchers, multiplied by 1000
Missing countries	Malta, Slovenia, Associated Countries (except Norway 2023)
Imputed years by country	2024 (EU27, BG, DK, EE, FR, DE, EL, IE, LT, LU, NL, PL, PT, RO, SK, ES, SE, NO), 2023 (CY, CZ, FI), 2022 (AT, BG, EE, HU, LT, SK, NO), 2021 (BE, CZ, IE, LU), 2020 (AT, HR, HU, LV), 2019 (CZ, PL), 2018 (BE, HR, CY, DK, FI, HU, IE, NL, PT, RO, SE), 2017 (AT, FR, DE, IT, ES), 2016 (EU27, BG, CY, EL, LV, RO)
Dasboard indicator	#47

Indicator #17	Number of collaboration networks of RPOs in Widening countries with other EU countries
Data source	Cordis Datalab
Dataset	Horizon Dashboard – Collaborations with other countries
Last update	18/08/2024
Time	2020 for Horizon2020, 2024 for Horizon Europe
Unit of measure	Number
Notes	Selection by programme (H2020 or Horizon Europe), Country Group as Member States that are non-widening countries (12) and Collaborative group as Member States that are widening countries (15). Collaboration Links are then delivered for each widening country that were involved in projects with the other EU countries (non-widening)
Countries covered	Widening countries (Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, Slovenia)
Missing countries	EU27, MS (except for widening countries), AC. **The indicator is by definition covering only widening countries.**
Imputed years by country	2019 (widening countries)
Dashboard indicator	#48

Indicator #18	Share of public R&D expenditures financed by the private sector
Numerator	
Data source 1	Eurostat Data Browser
Dataset	GERD by sector of performance and source of funds (rd_e_gerdfund)
Last update	17/03/2024
Time	2010-2022
Unit of measure	Million Euro

Indicator #18	Share of public R&D expenditures financed by the private sector
Source of funds	Business enterprise sector
Sector of performance	Govenrment sector and High education sector
Countries covered	EU27, MS, North Macedonia
Denominator	
Dataset	GERD by sector of performance and source of funds (rd_e_gerdfund)
Last update	17/03/2024
Time	2010-2022
Unit of measure	Million Euro
Source of funds	Total
Sector of performance	Govenrment sector and High education sector
Countries covered	EU27, MS, North Macedonia
Numerator	
Data source 2	OECD Data Explorer
Dataset	Main Science and Technology Indicators (MSTI database) – HERD financed by the business sector and GOVERD financed by the business sector
Time	2010-2022
Last update	10/07/2024
Unit of measure	Million US dollars, current prices, PPP converted
Countries covered	Israel, New Zealand
Denominator	
Dataset	Main Science and Technology Indicators (MSTI database) – Higher Education Expenditure on R&D (HERD) and Government Intramural Expenditure on R&D (GOVERD)

Indicator #18	Share of public R&D expenditures financed by the private sector
Time	2010-2022
Last update	10/07/2024
Unit of measure	Million US dollars, current prices, PPP converted
Countries covered	Israel, New Zealand
Calulation rule	Sum of government and high education R&D financed by the business sector, divided by the total government and high education R&D expenditure
Missing countries	Albania, Armenia, Georgia, Kosovo, Moldova, Morocoo, Tunisia, Ukraine, North Macedonia (only 1 value available)
Imputed years by country	2023 (BG, HR, CZ, EE, FI, EL, HU, IT LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, ES, IS, NO, RS, TR), 2022 (EU27, AT, BE, CY, DE, IE, SE, BA, IL, NZ), 2021 (DK), 2020 (AT, IE, SE, ME, NZ), 2019 (UK), 2018 (AT, SE, NZ), 2016 (AT, SE, ME, NZ, MK), 2015 (FR), 2014 (EU27, AT, PL, SE, NO, NZ, MK), 2012 (AT, SE, IS, ME, NO, NZ), 2011 (BA), 2010 (AT, EL, NL, SE, IS, ME, NO, NZ)
Dashboard indicator	#52

Indicator #19	Government budget allocations for R&D (GBARD) allocated to Europe-wide transnational, as well as bilateral or multilateral, public R&D programmes per FTE researcher
Numerator	
Data source	Eurostat Data Browser
Dataset	National public funding to transnationally coordinated R&D (gba_tncoor)
Last update	05/08/2024
Time	2010 - 2023
Unit of measure	Million Euro
Type of contribution recipient	Europe-wide transnational public R&D programmes and Bilateral or multilateral public R&D programmes

Indicator #19	Government budget allocations for R&D (GBARD) allocated to Europe-wide transnational, as well as bilateral or multilateral, public R&D programmes per FTE researcher
Countries covered	EU27 calculated manually as sum of MS, MS (except France), Norway, Serbia, United Kingdom
Denominator	
Data source	Eurostat Data Browser
Dataset	R&D personnel by sector of performance, professional position and sex (rd_p_persocc)
Last update	17/03/2024
Time	2010-2022
Unit of measure	FTE, sex as TOTAL, sector of performance as TOTAL, professional position as RSE
Countries covered	EU27, MS, Norway, Serbia, United Kingdom
Imputed years by country for Researchers	2023 for all countries available, plus Greece (2010), United Kingdom (2020:2022)
Calculation rule	Sum of R&D programmes selected multiplied by 1,000,000, divided by the number of FTE researchers
Missing countries	France, Associated Countries (except Norway, Serbia, United Kingdom)
Imputed years by country	2024 (EU27, FI, IE, LV, LU, MT, NL, SK, ES, NO, RS), 2023 (AT, BE, BG, HR, CY, CZ, DK, EE, EL, HU, IT, LT, PL, PT, RO, SI, SE), 2020 (UK), 2019 (RS), 2016 (DE), 2013 (HU), 2012 (RS), 2011 (EL, IT, SE), 2010 (FI, DE, RO, SI)
Dashboard indicator	#53

3.2. ERA Dashboard 2024

Below the tables for each indicator in the ERA Dashboard 2024, where data sources, calculation rules, countries covered and years imputed are reported.

Indicator #1	Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP
Scoreboard indicator	#1

Indicator #2	Government Budget Allocations for R&D (GBARD) as share of GDP
Data source 1	Eurostat Data Browser
Dataset	GBARD by socioeconomic objectives (NABS 2007) (gba_nabsfin07)
Last update	30/01/2024
Time	2010-2023
Unit of measure	Percentage of GDP
NABS 2007	Total government budget allocations for R&D (TOTAL)
Countries covered	EU27, MS, Albania (1 value), Bosnia and Herzegovina, Iceland, North Macedonia (2 values), Norway, Serbia, Türkiye, United Kingdom
Numerator	
Data source 2	OECD Data Explorer
Dataset	Government budget allocations for R&D
Time	2010-2023
Last update	16/05/2024
Unit of measure	US dollars, PPP convertes, Constant prices
Denominator	
Data source 2	OECD Data Explorer
Dataset	Annual GDP and components - expenditure approach

Time	2010-2023
Last update	24/09/2024
Unit of measure	US dollars, PPP converted, Current prices
Countries covered	Israel and New Zealand
Calculation rule	GBARD/GDP*100
Missing countries	Armenia, Georgia, Kosovo, Moldova, Montenegro, Morocoo, Tunisia, Ukraine
Imputed years by country	2024 (EU27, MS, IS, NO, RS, TR), 2023 (IL, AL), 2022 (BA), 2021 (AL), 2020 (UK), 2018 (NZ), 2015 (MK), 2013 (BA), 2012 (RS, MK)

Indicator #3	Researchers (in full-time equivalent) per million inhabitants
Scoreboard indicator	#2

Indicator #4	Business Enterprise expenditure on R&D (BERD) as a percentage of GDP
Data source 1	Eurostat Data Browser
Dataset	BERD by NACE Rev. 2 activity (rd_re_berdindr2)
Last update	24/09/2024
Time	2010-2022
Unit of measure	Percentage of GDP
Statistical classification of economic actitivies	Total – all NACE activities
Countries covered	EU27, MS, Bosnia Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Türkiye, United Kingdom
Numerator	
Data source 2	OECD Data Explorer
Dataset	Business enterprise R&D expenditure by industry

Time	2010-2022
Last update	17/09/2024
Unit of measure	US dollars, PPP convertes, Current prices
Denominator	
Data source 2	OECD Data Explorer
Dataset	[Annual GDP and components - expenditure approach](#)
Time	2010-2023
Last update	24/09/2024
Unit of measure	US dollars, PPP converted, Current prices
Countries covered	Israel and New Zealand
Calculation rule	BERD/GDP*100
Missing countries	Albania, Armenia, Georgia, Kosovo, Moldova, Morocoo, Tunisia, Ukraine
Imputed years by country	2023 (EU27, MS, IS, NO, RS, TR, MK), 2022 (NZ, BA), 2021 (IL, MK), 2020 (ME, UK), 2016 (NZ), 2014 (NZ, MK), 2012 (IS, ME, NZ), 2011 (BA), 2010 (ME, NZ)

Indicator #5	**Expenditure on total innovation procurement (R&D and innovative solutions) as percentageof GDP**
Sub-indicators	#5.1, #5.2, #5.3
Scoreboard indicator	#3 (#3.1, #3.2, #3.3)

Indicator #6	**Share of publications available in open access (green, gold and diamond)**
Scoreboard indicator	#4

Indicator #7	Number of open-access research datasets by country
Data source	OpenAIRE
Dataset	OpenAIRE Graph Dataset – Dataset
Last update	26/07/2024
Time	2010-2023
Unit of measure	Number of research datasets that are open access by cuountry
Countries covered	EU27 (calculated manually as mean of MS), MS, AC (except missing countries)
Missing countries	Greece, United Kingdom
Imputed years by country	2023 (PL), 2022 (SE), 2021 (PL), 2020 (IT, ES), 2018 (FR), 2017 (DE, ES), 2016 (NL), 2011 (NL)

Indicator #8	Number of open-access research datasets by country
Data source	Registry of Research data Repositories - re3data.org (EOSC Observatory)
Dataset	Repositories – Browse by country
Last update	24/09/2024
Time	2024
Unit of measure	Number of research reposities
Countries covered	EU27, MS (except missing countries), Bosnia and Herzegovina, Iceland, Israel, New Zealand, Norway, Serbia, Tunisia, Türkiye, Ukraine, United Kingdom.
Missing countries	Bulgaria, Malta, Albania, Armenia, Georgia, Kosovo, Moldova, Montenegro, Morocco, North Macedonia,
Imputed years by country	2023 (EU27, MS (except BG, MT), BA, IS, IL, NZ, NO, RS, TN, TR, UA, UK)

Indicator #9	Country investments in EOSC and Open Science (in ranges of investment)
Data source	EOSC Observatory
Dataset	Country investments in EOSC and Open Science – National contributions 2022
Last update	Not available
Time	2022
Unit of measure	Ranges of investment
Countries covered	MS (17 only, except 10 missing countries), Bosnia and Herzegovina, Georgia, Norway, Serbia, Türkiye, Ukraine.
Missing countries	EU27, Austria, Belgium, Croatia, Hungary, Italy, Lithuania, Malta, Portugal, Romania, Sweden, Albania, Armenia, Iceland, Israel,, Kosovo, Moldova, Montenegro, Morocco, North Macedonia, New Zealand, Tunisia, United Kingdom.
Imputed years by country	2021 and 2023 (BG, CY, CZ, DK, EE, FI, FR, DE, HU, IE, LV, LU, NL, PL, SK, SI, ES, BA, GE, NO, RS, TR, UA)

Indicator #10	Share of national public R&D expenditure committed to European research infrastructures
Scoreboard indicator	#5

Indicator #11	Number of European research infrastructures in which a Member State or an Associated Country participates (financially contributes to operations).
Data source	ESFRI
Dataset	ESFRI RIs PORTFOLIO
Last update	Not available
Time	2023
Unit of measure	Number (cumulative from Roadmap entry 2006, 2008, 2010, 2016, 2018, 2021)

Countries covered	EU27 (calculated manually as mean of MS), MS, Albania, Bosnia and Herzegovina, Georgia, Iceland, Israel, Moldova, Montenegro, North Macedonia, Norway, Serbia, Türkiye, Ukraine, United Kingdom.
Missing countries	Armenia, Kosovo, Morocco, New Zealand, Tunisia.
Imputed years by country	2023 (EU27, MS, AI, BA, GE, IS; IL, MD, ME, MK, NO, RS, TR, UA, UK)
Notes	Included Ris where the countries participates as Member, Prospective Member or Leader. Observer status has not been included, although it could happen that they can contribute financially, but such information is hard to find.

Indicator #12	Share of women in grade A positions in higher education institutes
Scoreboard indicator	#6

Indicator #13	Proportion of papers with mixed gender authorship
Data source	ScienceMetrix (provided by the European Commission)
Dataset	Corrected proportion of mixed gender teams
Last update	04/09/2024
Time	2010-2023
Unit of measure	Percentage
Countries covered	EU27, MS, AC
Imputed years by country	2024 (EU27, MS, AC)
Notes	The corrected version of the variable refers to the shares calculated based on the total number of publications for which the gender of the author could be identified.

Indicator #14	Proportion of women in authorships of the top 10% most cited publications
Data source	ScienceMetrix (provided by the European Commission)
Dataset	Corrected Proportion of Women Authorship – Highly cited
Last update	04/09/2024
Time	2010-2021
Unit of measure	Percentage
Countries covered	EU27, MS, AC
Imputed years by country	2022 (EU27, MS, AC)
Notes	The corrected version of the variable refers to the shares calculated based on the total number of publications for which the gender of the author could be identified.

Indicator #15	Women in Digital Index
Data source	Women in Digital Scoreboard – European Commission
Dataset	Women in Digital Scoreboard
Last update	2024
Time	2018, 2019, 2020, 2021, 2022, 2024
Unit of measure	Score (0 - 100)
Countries covered	EU27, MS, United Kingdom (2018, 2019, 2020)
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocoo, New Zealand, North Macedonia, Norway, Serbia, Tunisia, Türkiye, Ukraine
Imputed years by country	2023 (EU27, MS), 2021 (SI, UK), 2017 (EU27, MS, UK)
Notes	Scores collected from reports when tables not available

Indicator #16	Proportion (%) of women among doctoral graduates by narrow fields of Science, Technology, Engineering and Mathematics (STEM)
Data source	Eurostat Data Browser
Dataset	Graduates by education level, programme orientation, sex and field of education (educ_uoe_grad02)
Last update	02/09/2024
Time	2010-2022, no 2011 and 2012
Unit of measure	Number, Sex as FEMALE and sex as TOTAL
ISCED 2011 – International Standard Classification of Education	Doctoral or equivalent level
ISCED F 2013 - Fields of education and training	[F05] Natural sciences, mathematics and statistics [F06] Information and Communication Technologies [F07] Engineering, manufacturing and construction
Calculation rule	N. of STEM female doctoral graduates divided by the Total N. of STEM doctoral graduates, multiplied by 100
Countries covered	EU27, MS, Albania, Bosnia and Herzegovina, Iceland, Norway, North Macedonia, Montenegro, Serbia, Türkiye, United Kingdom.
Missing countries	Armenia, Georgia, Israel, Kosovo, Moldova, Morocco, New Zealand, Tunisia, Ukraine
Imputed years by country	2023 (EU27, MS, AL, IS, MK, RS, TR), 2022 (ME, NO), 2021 (BA), 2020 (AL, ME, UK), 2018 (BA), 2016 (NL), 2013 (PL, RS, TR), 2012 (EU27, HR, CZ, DK, DE, EL, IE, IT, LT, LU, MT, RO, IS, MK, UK)

Indicator #17	Share of foreign doctorate students as a percentage of all doctorate students
Scoreboard indicator	#7

Indicator #18	New doctorate graduates per 1,000 inhabitants aged 25-34
Data source	Eurostat Data Browser
Dataset	Graduates at doctoral level, in science, math., computing, engineering, manufacturing, construction, by sex - per 1000 of population aged 25-34 (educ_uoe_grad07)
Last update	31/05/2024
Time	2013-2022
Unit of measure	Per thousand inhabitants, sex as TOTAL
Countries covered	EU27, MS, Albania, Iceland, Norway, North Macedonia, Serbia, Türkiye, United Kingdom.
Missing countries	Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Morocco, Montenegro, New Zealand, Tunisia, Ukraine
Imputed years by country	2023 (EU27, MS, AL, IS, MK, RS, TR), 2022 (NO), 2020 (AL, UK), 2016 (NL), 2014 (EU27, TR), 2013 (PL, RS), 2012 (MS (except PL, NL), IS, MK, NO, UK)

Indicator #19	Share of public-private co-publications
Data source	ScienceMetrix (provided by the European Commission)
Dataset	Share of Public/Private Co-publications
Last update	04/09/2024
Time	2010-2023
Unit of measure	Percentage
Countries covered	EU27, MS, AC
Imputed years by country	2024 (EU27, MS, AC)

Indicator #20	Best practice examples and methodologies for knowledge valorisation
Data source	Knowledge Valorisation Platform – Repository of best practices
Dataset	Number of best practices by country (cumulative value without differentiating by year, manually calculated)
Time	2024 as reference year
Last update	March 2024
Countries covered	EU27, MS (except Bulgaria), RS, UK
Missing countries	Bulgaria, Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Morocco, Montenegro, New Zealand, North Macedonia, Norway, Tunisia, Türkiye, Ukraine
Imputed years by country	2023 (EU27, MS (except BG), RS, UK)
Notes	The indicator is qualitative, so the main information is reported directly in the ERA Dashboard report. The table only shows the total numebr of best practices for descriptive purposes.

Indicator #21	Number of PCT patent applications divided by GDP in million Euros
Numerator	
Data source 2	OECD Data Explorer
Dataset	Patents by technology (patent counts)
Time	2010-2020
Last update	23/05/2024
Unit of measure	Patents, Measure: patent applications
Details	Reference date type: Priority date; Agent role: Inventor
Countries covered	EU27, MS, AC (except Albania, Kosovo, Montenegro, Serbia)
Denominator	
Data source 1	Eurostat Data Browser

Dataset	[GDP and main components (output, expenditure and income)](#) – GDP at market prices
Time	2010-2023
Last update	19/10/2024
Unit of measure	Current prices, million euro
Countries covered	EU27, MS, Iceland, Norway, United Kingdom, Bosnia and Herzegovina, Montenegro, North Macedonia, Türkiye
Data source 2	OECD Data Explorer
Dataset	[Annual GDP and components - expenditure approach](#)
Time	2010-2023
Last update	23/10/2024
Unit of measure	US dollars, exchange rate converted
Countries covered	Georgia, Israel, New Zealand
Data source 3	World Bank Open Data
Dataset	[GDP (current US$)](#)
Time	2010-2023
Last update	2024-09-19
Unit of measure	US dollars, current prices
Countries covered	Armenia, Moldova, Morocco, Tunisia, Ukraine
Calculation rule	Number of patent application/GDP
Missing countries	Albania, Kosovo, Montenegro, Serbia
Imputed years by country	2021 (EU27, MS, AC (except AL, XK, ME, RS)), 2020 (UK)

Indicator #22	Share of innovating firms collaborating with higher education institutions or public/private research institutions
Scoreboard indicator	#8

Indicator #23	Business enterprise researchers as % of national, total
Data source	OECD Data Explorer
Dataset	Main Science and Technology Indicators (MSTI database) – Business enterprise sector researchers
Last update	10/07/2024
Time	2010-2022
Unit of measure	Percentage of researchers
Countries covered	EU27, MS (except Cyprus and Malta), Iceland, New Zealand, Norway, Türkzie, United Kingdom.
Missing countries	Albania, Armenia, Bornia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, North Macedonia, Serbia, Tunisia, Ukraine
Imputed years by country	2023 (EU27, MS (except CY, MT), NO, TR), 2022 (IS, NZ), 2020 (NZ), 2018 (NZ, UK), 2016 (NZ), 2014 (NZ), 2012 (IS, NZ), 2010 (EL, IS, NZ)

Indicator #24	Business enterprise researchers in full-time equivalent per thousand employment in industry
Numerator	
Data source	OECD Data Explorer
Dataset	Main Science and Technology Indicators (MSTI database) – Business enterprise sector researchers
Last update	10/07/2024
Time	2010-2022
Unit of measure	FTE

Denominator	
Data source	OECD Data Explorer
Dataset	[Employed population by economic activity](#)
Last update	25/09/2024
Time	2010-2023
Unit of measure	Persons, thousands
Economic activity	Employment, Industry (except construction)
Calculation rule	BES researchers/(Persons employed in industry*1000)*1000
Countries covered	EU27, MS, Iceland, New Zealand, Norway, Türkiye, United Kingdom.
Missing countries	Albania, Armenia, Bornia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, North Macedonia, Serbia, Tunisia, Ukraine
Imputed years by country	2023 (EU27, MS except (BE, CY, LV, MT, RO), NO, TR, UK), 2022 (BE, NZ, IS), 2020 (IS), 2016 (NZ), 2014 (NZ), 2012 (IS, NZ), 2010 (EL, IS, NZ)

Indicator #25	Patents by universities and public research organisations
Data source	PATSTAT – Fraunhofer ISI
Dataset	Patents filed by universities and PROs
Last update	30/09/2024
Time	2010-2021 (2022 left out as incomplete)
Unit of measure	Number
Countries covered	EU27 calculated manually as mean of MS, MS and AC (except for Kosovo)
Missing countries	Greece, Kosovo
Imputed years by country	2022 (EU27, MS, AC (except XK)), 2019 (ME), 2017 (AL), 2015 (AL), 2014 (ME), 2012 (AL), 2010 (MK)
Notes	The year 2022 is partially available, therefore we left it out to avoid misleading description. Data for all EPC member states over time

	filed by universities and PROs.

Indicator #26	Number of scientific publications among the top-10% most cited publications worldwide as a percentage of all publications
Scoreboard indicator	#9

Indicator #27	Academic Freedom Index (AFI)
Data source	V-Dem Dataset – Varieties of Democracies
Dataset	Academic Freedom index
Last update	March 2024
Time	2010-2023
Unit of measure	Index (low to high (0-1))
Countries covered	EU27 (calculated as mean of MS values), MS, AC (except for New Zealand)
Missing countries	New Zealand
Imputed years by country	none
Notes	Retrieved from R library "v2xca_academ"

Indicator #28	Average ranking score of top 10 universities by country and year
Data source	QS World University Rankings
Dataset	QS World University Rankings (2022-2024): Top global universities
Last update	2025
Time	2022-2024 (2025 available)
Unit of measure	Index (low to high (0-100))
Countries covered	EU27 (calculated manually as mean of MS values), Austria, Belgium, Cyprus, Czechia, Denmark, Estonia, Finland, France,

	Germany, Greece, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden, Israel, New Zealand, Norway, Türkiye United Kingdom
Missing countries	Bulgaria, Croatia, Hungary, Latvia, Malta, Romania, Slovenia, Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Kosovo, Moldova, Montenegro, Morocco, North Macedonia, Serbia, Tunisia, Ukraine
Calculation rule	First, select for each country the top 10 universities (by highest score). Second, run the average score across them by country and year.
Imputed years by country	2023 (LU), 2022 (TR), 2021 (EU27, MS (except BG, HR, HU, LV, MT, RO, SI), IL, NZ, NO, UK)

Indicator #29	Sum of ERC grants received by country in a given year per 1,000 R&D personnel (in FTEs)
Numerator	
Data source	ERC grants – ERC Dashboard
Dataset	Dashboard for ERC funded projects and evaluated proposals
Last update	05/09/2024
Time	2010-2024
Unit of measure	€ EU contribution
Countries covered	EU27 (calculated manually as sum of European grants as first step), Member States, Associated Countries (Israel, Iceland, Norway, Türkyie, Serbia, Ukraine, United Kingdom)
Denominator	
Data source 1	Eurostat Data Browser
Dataset	R&D personnel by sector of performance, professional position and sex (rd_p_persocc)
Last update	17/03/2024
Time	2010-2022
Unit of measure	FTE, sex as TOTAL, sector of performance as GOV and HES, professional position as RSE

Countries covered	EU27, MS, Norway, Serbia, Türkiye
Data source 2	OECD Data Explorer
Dataset	[R&D personel](#) by sector of performance and major field of R&D
Last update	04/09/2024
Time	2010-2022
Unit of measure	FTE, sex as TOTAL, sector of performance as TOTAL, professional position as RSE
Imputed years by country for researchers	2023 (EU27, MS, MK, NO, RS, TR, BA, GE, MD, TN, UA, AM), 2022 (IS, NZ), 2021 (MK), 2020 (UK, MK, NZ), 2018 (NZ), 2017 (MA), 2016 (NZ), 2015 (MA), 2014 (IS, NZ), 2013 (LT, MA), 2012 (GE, IS, ME, NZ), 2011 (BA), 2010 (EL, IS, ME, NZ)
Countries covered	Iceland, Israel, New Zealand, United Kingdom
Calculation rule	Sum of ERC grants by country and year divided by the number of researchers by country and year, multiplied by 1000
Missing countries	Albania, Armenia, Georgia, Israel, Kosovo, Moldova, Morocco, New Zealand, Tunisia, Ukraine
Imputed years by country	2023 (LT, SK, RS), 2021 (HR), 2020 (EE), 2018 (BG, TR), 2017 (CY), 2016 (MT), 2015 (LT, IS, RS), 2014 (MT, PL), 2013 (EE, LV, RO, IS, RS), 2011 (HR, LV, SK, TR), 2010 (LU, SI)

Indicator #30	International co-publications with non-EU partners per 1,000 researchers in the public sector
Scoreboard indicator	#10

Indicator #31	Share of patents with foreign co-inventors
Data source	OECD Data Explorer
Dataset	[Patents with foreign co-inventors](#)
Last update	24/05/2024
Time	2010-2020

Unit of measure	Percentage of patents
Patent authority	European Patent Office (6F0)
Countries covered	EU27, MS, AC (except missing countries)
Missing countries	Albania, Kosovo, Montenegro, Serbia
Imputed years by country	2021 (EU27, MS, AC, except missing countries)

Indicator #32	European and international co-patenting in EPO applications at national and EU level
Data source	Eurostat Data Browser
Dataset	Co-patenting at the EPO according to applicants'/inventors' country of residence - number (1977-2013) - pat_ep_cp
Last update	09/01/2017
Time	2010-2013
Unit of measure	Number
Co-patenting involving inventors/applicants from the reporting country:	[NAT]: Co-patenting involving inventors/applicants from the reporting country [NAT_EU]: Co-patenting involving inventors/applicants from the reporting country and one or more EU Member States [NAT_EU_NEU]: Co-patenting involving inventors/applicants from the reporting country, one or more EU Member States and one or more non-EU countries [NAT_NEU]: Co-patenting involving inventors/applicants from the reporting country and one or more non-EU countries
Category	Applicant
Countries covered	EU27 (calculated as mean of MS), MS, Iceland, Israel, New Zealand, Norway, Türkiye, United Kingdom
Calculation rule	Sum of types of co-patenting activities by country and year
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Kosovo, Moldova, Montenegro, Morocco, North Macedonia, Serbia, Tunisia, Ukraine

Imputed years by country	2014 (EU27, MS, AC, except missing countries)

Indicator #33	Government budget allocations for R&D (GBARD) according to NABS as share of total GBARD
Data source	Eurostat Data Browser
Dataset	GBARD by socioeconomic objectives (NABS 2007) - gba_nabsfin07
Last update	05/08/2024
Time	2010-2023
Unit of measure	Million Euro
NABS 2007	**Numerator:** Environment (NABS02), Energy (NABS05) and Transport, telecommunication and other infrastructures (NABS04) **Denominator:** Total GBARD
Countries covered	EU27, MS, Bosnia and Herzegovina, Iceland, Norway, Serbia , Türkiye, United Kingdom
Calculation rule	Sum of NABS02, NABS05, NABS04, all divided by total GBARD and multiplied by 100
Missing countries	Albania, Armenia, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, North Macedonia, New Zealand, Tunisia, Ukraine
Imputed years by country	2022 (BA), 2020 (LT, UK), 2013 (BA), 2012 (RS), 2011 (PL)

Indicator #34	Environmentally related government R&D budget, percentage of total government R&D
Scoreboard indicator	#11

Indicator #35	National public and private investments as suggested in the SET Plan progress report 2021.
Data source	SETIS research and innovation data
Dataset	Public and Private R & I
Last update	2023 publication - Mountraki, A., Georgakaki, A., Shtjefni, D., Ince, E. and Primavera, J. R&I data for SETIS and the State of the Energy Union Report, European Commission 2023, JRC135385. http://data.europa.eu/89h/jrc-10115-10001
Time	2010-2021
Unit of measure	EUR million
Countries covered	EU27 (calculated manually as mean of MS values), Member States
Missing countries	Associated Countries
Calcualtion rule	Sum of public and private R&I investments
Imputed years by country	2021 (EU27, MS)
Notes	Data downloaded from website, data for 2021 is not complete as contains only private R&I investments, therefore has been ignored.

Indicator #36	Patents on environmental technology
Data source	OECD Data Explorer
Dataset	Patents - indicators
Last update	19/12/2023
Time	2010-2021
Unit of measure	Percentage of technologies
Type of patent counting	Development of environment-related technologies
Technological domain	Environment-related technologies
Countries covered	EU27, Member States, Associated Countries (except missing countries)

Missing countries	Albania, Kosovo
Imputed years by country	2022 (EU27, MS, AC, except missing countries), 2021 (AM, BA, MD), 2020 (ME), 2019 (EU27, MK), 2018 (ME), 2017 (MD), 2016 (LV, ME), 2014 (ME), 2012 (ME), 2010 (MD, ME, MK)

Indicator #37	Share of products and/or processes by innovative firms cooperating with higher education institutions or public/private research institutions
Data source	Eurostat Data Browser
Dataset	Eurostat Community Innovation Survey - CIS
Time	2010, 2012, 2014, 2016, 2018, 2020
Survey round	CIS 2010
Dataset	Types of co-operation partner for product and process innovation (2010) - inn_cis7_coop
Last update	21/03/2019
Statistical classification	Innovation core activities (Com. Reg. 1450/2004) - (B-M71_INN)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06), Enterprises co-operating with Government or public research institutes (C07)
Unit of measure	Percentage
Size class	Total
Missing countries	Greece, Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine, United Kingdom
Survey round	CIS 2012
Dataset	Types of co-operation of the enterprises by NACE Rev.2 activity and size class (2012) - inn_cis8_coop
Last update	19/03/2019
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)

Indicator #37	Share of products and/or processes by innovative firms cooperating with higher education institutions or public/private research institutions
Type of innovator	Product and/or process innovative enterprises, regardless of organisational or marketing innovation (including enterprises with abandoned/suspended or on-going innovation activities) (INNOACT)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06), Enterprises co-operating with clients or customers frin the public sector (C032)
Unit of measure	Percentage
Size class	Total
Missing countries	Netherlands, Poland, Romania, Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2014
Dataset	Types of co-operation of the enterprises by NACE Rev.2 activity and size class (2014) - inn_cis9_coop
Last update	23/04/2021
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Type of innovator	Product and/or process innovative enterprises, regardless of organisational or marketing innovation (including enterprises with abandoned/suspended or on-going innovation activities) (INNOACT)
Innovation indicator	Enterprises co-operating with universities or other higher education institutions (C06), Enterprises co-operating with Government, public or private research institutes (C09)
Unit of measure	Percentage
Size class	Total
Missing countries	Sweden, Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2016
Dataset	Product and/or process innovative enterprises engaged in co-operation by co-operation partner, NACE Rev. 2 activity and size

Indicator #37	Share of products and/or processes by innovative firms cooperating with higher education institutions or public/private research institutions
	class (2016)- inn_cis10_coop
Last update	03/07/2019
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Cooperation partners	Universities and other higher education institutions (UNIV), Government and public research institutes (PUB_GOV_RI)
Unit of measure	Percentage
Size class	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, North Macedonia, Tunisia, Ukraine
Survey round	CIS 2018
Dataset	Enterprises that co-operated on R&D and other innovation activities with other enterprises or organisations, by kind and location of co-operation partner, NACE Rev. 2 activity and size class (2018) - inn_cis11_coop
Last update	11/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterpises	Innovation active enterprises (INN)
Cooperation partners	Universities and other higher education institutions (UNIV), Government, public or private research institutes (GOV_RI)
Unit of measure	Percentage
Size class	Total
Location of partners	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Survey round	CIS 2020

Indicator #37	Share of products and/or processes by innovative firms cooperating with higher education institutions or public/private research institutions
Dataset	Innovative enterprises that co-operated on R&D and other innovation activities with other enterprises or organisations, by kind and location of co-operation partner, NACE Rev. 2 activity and size class (2020) - inn_cis12_coop
Last update	12/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Cooperation partners	Universities and other higher education institutions (UNIV), Government, public or private research institutes (GOV_RI)
Unit of measure	Percentage
Size class	Total
Location of partners	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Calculation rule	Mean value between the percentages collected for UNIV and GOV_RI, by country and year.
Imputed years by country	2021 (EU27, MS, NO, TR), 2019 (EU27, MS, IS, NO, TR), 2017 (EU27, MS, NO, RS, TR, UK), 2015 (EU27, MS (except SE), MK, NO, RS, TR, UK), 2013 (MS (except PL, NL, RO, SE), MK, NO, RS, TR, UK), 2011 (MS (except PL, NL, RO), NO, RS, TR, UK)

Indicator #38	Purchased or licensed-in patents or other IPRs from public research organisations, universities or higher education institutions
Data source	Eurostat Data Browser
Dataset	Eurostat Community Innovation Survey - CIS
Time	2018, 2020
Survey round	CIS 2018
Dataset	Enterprises that purchased or licensed in intellectual property rights by type of issuing organisation, NACE Rev. 2 activity and size class

	(2018) – inn_cis11_iprin
Last update	11/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterprise	Total
Transaction and type of Intellectual Property Rights (IPRs)	[LIC_IN_PUR_PUB]: Licensing-in or purchasing from public research organisations, universities or other higher education institutions
Unit of measure	Number
Size class	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Survey round	CIS 2020
Dataset	Enterprises that purchased or licensed in intellectual property rights by type of issuing organisation, NACE Rev. 2 activity and size class (2020) – inn_cis12_iprin
Last update	17/11/2022
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterprise	Total
Transaction and type of Intellectual Property Rights (IPRs)	[LIC_IN_PUR_PUB]: Licensing-in or purchasing from public research organisations, universities or other higher education institutions
Unit of measure	Number
Size class	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Countries covered	EU27 (calculated manually as mean of MS values) , Member States
Imputed years by	2021 (EU27, MS except BE, CY, DE, DK, FR, IE, LT, LU, NL, SE),

country	2019 (EU27, MS except CY, DK, IE, NL), 2017 (EU27, MS except CY, DK, IE, NL)

Indicator #39	Direct government support plus indirect government support through R&D tax incentives as a percentage of GDP
Scoreboard indicator	#13

Indicator #40	Green bond issuance as a percentage of total bond issuance
Data source	Eurostat Data Browser
Dataset	Green bond issuance by corporates and governments - sdg_13_70a
Last update	11/06/2024
Time	2022 (MS)
Unit of measure	Percentage of total
Dataset	Green bond issuance by type of issuer - sdg_13_70
Last update	11/06/2024
Time	2014-2022 (EU27)
Unit of measure	Percentage of total
Countries covered	EU27, MS,
Missing countries	Associated Countries
Imputed years by country	2022 (EU27, MS), 2021 (MS), 2013 (EU27)

Indicator #41	Trust in science
Data source	GESIS - Leibniz-Institut für Sozialwissenschaften
Dataset	Eurobarometer 95.2 (2021)
Last update	06/04/2022

Time	2021
Calculation rule	First count respondants that replied (at least once) to any the following: - very positive to QA6 - strongly agree to QA9.7 - strongly agree to QA10.3 - strongly agree to QA10.5 Sum replies by country; proceed with weightening the results: - For countries: sum of replies*w3a/total respondandts, then avarage value by country; - For the EU: sum of replies* w87 /total respondandts, then avarage value by country and collapsed at EU level. Values are then multiplied by 100
Countries covered	EU27, MS, Albania, Bosnia and Herzegovina, Iceland, Kosovo, Montenegro, North Macedonia, Norway, Serbia, Türkiye, United Kingdom
Missing countries	Armenia, Georgia, Israel, Moldova, Morocco, New Zealand, Tunisia, Ukraine
Imputed years by country	2022 (EU27, MS, AC, except missing countries), 2020 (EU27, MS, AC, except missing countries)
Notes	Data manually downloaded from the source

Indicator #42	Increase in total R&D expenditure in Widening countries expressed as a percentage of GDP
Scoreboard indicator	#15

Indicator #43	Number of participations in Horizon Europe (of Widening countries) measured in terms of 1,000 R&D personnel (in FTEs)
Numerator	
Data source	Cordis Datalab
Dataset	Horizon Dashboard – R&I projects
Last update	18/08/2024
Time	2014-2024
Notes	Participation is counted as the number of organisations by country participating in a project. Thus, if for example, in a project, 3 German oganisations are participating, participation for Germany for that project will be counted as 3. Data consider participation in Horizon2020 and Horizon Europe as programmes
Countries covered	EU27 (calculated as sum of participations in MS as numerator), MS, Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Türkiye
Denominator	
Data source 1	Eurostat Data Browser
Dataset	R&D personnel by sector of performance, professional position and sex (rd_p_persocc)
Last update	17/03/2024
Time	2010-2022
Unit of measure	FTE, sex as TOTAL, sector of performance as GOV and HES, professional position as RSE
Countries covered	EU27, MS, Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Türkiye, United Kingdom
Calculation rule	N. participations divided by number of R&D personnel multiplied by 1000, by country and year
Missing countries	Albania, Armenia, Georgia, Israel, Kosovo, Moldova, Morocco, New Zealand, Tunisia, Ukraine
Imputed years by country	2013 (EU27, MS AC, except missing countries)

Indicator #44	Sum of Horizon Europe grants received by (Widening) country in a given year measured in terms of 1,000 R&D personnel (in FTEs)
Numerator	
Data source	Cordis Datalab
Dataset	Horizon Dashboard – R&I projects
Last update	18/08/2024
Time	2014-2024
Notes	Grants are reffered to as the Net EU contribution, reported in €
	Data consider participation in Horizon2020 and Horizon Europe as programmes
Countries covered	EU27 (calculated as sum of total grants received by MS as numerator), MS, Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Türkiye
Denominator	
Data source 1	Eurostat Data Browser
Dataset	R&D personnel by sector of performance, professional position and sex (rd_p_persocc)
Last update	17/03/2024
Time	2010-2022
Unit of measure	FTE, sex as TOTAL, sector of performance as GOV and HES, professional position as RSE
Countries covered	EU27, MS, Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Türkiye, United Kingdom
Calculation rule	Grants received divided by number of R&D personnel multiplied by 1000, by country and year
Missing countries	Albania, Armenia, Georgia, Israel, Kosovo, Moldova, Morocco, New Zealand, Tunisia, Ukraine
Imputed years by country	2013 (EU27, MS AC, except missing countries)

Indicator #45	Summary Innovation Index (Widening countries)
Data source	European innovation scoreboard
Dataset	Summary Innovation Index
Last update	Not available
Time	2017-2024
Unit of measure	Scores (0,1)
Countries covered	EU27, MS, Bosnia and Herzegovina, Iceland, Moldova, Montenegro, North Macedonia, Norway, Serbia, Türkiye, Ukraine, United Kingdom
Missing countries	Albania, Armenia, Georgia, Israel, Kosovo, Morocco, New Zealand, Tunisia
Imputed years by country	2016 (EU27, MS AC, except missing countries)
Notes	Data downloaded from website. EIS 2024, neighborhood database. Scores are after imputation, adjustment for outliers and skewness and normalisation between 0 and 1.

Indicator #46	Share of enterprises using public funds from different governance levels (local or regional, national, and EU) for R&I activities
Data source	Eurostat Data Browser
Dataset	Eurostat Community Innovation Survey - CIS
Time	2018, 2020
Survey round	CIS 2018
Dataset	Enterprises that received public funding for research and development (R&D) or other innovation activities, by source of funding, NACE Rev. 2 activity and size class (2018) – inn_cis11_pub
Last update	11/07/2023
Statistical	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)

classification	
Enterprise	Total
Source of funding	[PUB_FUND_RNDINN]: Public funding (used for R&D or other innovation activities) [GOV_CTL_RNDINN]: National central government (used for R&D or other innovation activities) [AUT_LOC_REG_RNDINN]: Local or regional authorities (used for R&D or other innovation activities) [EU_HP2020_RNDINN]: EU Horizon 2020 Programme (used for R&D or other innovation activities) [EU_OTH_RNDINN]: Other financial support from an EU institution (used for R&D or other innovation activities)
Unit of measure	Percentage
Size class	Total
Survey round	CIS 2020
Dataset	Enterprises that received public funding for research and development (R&D) or other innovation activities, by source of funding, NACE Rev. 2 activity and size class (2020) - inn_cis12_pub
Last update	12/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterprise	Total
Source of funding	[PUB_FUND_RNDINN]: Public funding (used for R&D or other innovation activities) [GOV_CTL_RNDINN]: National central government (used for R&D or other innovation activities) [AUT_LOC_REG_RNDINN]: Local or regional authorities (used for R&D or other innovation activities) [EU_HP2020_RNDINN]: EU Horizon 2020 Programme (used for R&D or other innovation activities) [EU_OTH_RNDINN]: Other financial support from an EU institution (used for R&D or other innovation activities)

Unit of measure	Percentage
Size class	Total
Calculation rule	Mean across values for each country and year
Countries covered	EU27 (calculated as mean of MS values), MS (except missing countries)
Missing countries	Denmark, Ireland, Netherlands, Associated Countries
Imputed years by country	2021 (EU27, MS, except missing countries), 2019 (EU27, MS, except missing countries), 2017 (EU27, MS, except missing countries)

Indicator #47	Number of Seal of Excellence projects published on the InvestEU Portal that have received funding per 1,000 R&D personnel (in FTEs)
Scoreboard indicator	#16

Indicator #48	Number of collaboration networks of RPOs in Widening countries with other EU countries
Scoreboard indicator	#17

Indicator #49	Average number of partners from non-widening countries per institution from a Widening country participating in the Horizon programme each year
Data source	Cordis Datalab
Dataset	Horizon Dashboard – R&I projects (participant type and partner)
Last update	18/08/2024
Time	2014-2024
Countries covered	Widening countries
Calculation rule	Number of partners is defined as the n. of institutions per country and per project.

Indicator #49	Average number of partners from non-widening countries per institution from a Widening country participating in the Horizon programme each year
	First step: calculate sum of tot partners per project,
	Second step: calculate sum of partners from widening_c,
	Third step: difference per country between total partners and partners from widening countries.
	Avarage n. of partners from non-widening countries: avarage among partners by country and year
Missing countries	EU27, non-widening MS, Asscoiated countries
Imputed years by country	2013 (widening countries)
Notes	Data consider participation in Horizon2020 and Horizon Europe as programmes

Indicator #50	Share of patents registered by a Widening country together with partners from other EU countries
Data source	OECD Data Explorer
Dataset	[Patents with foreign co-inventors](#)
Last update	24/05/2024
Time	2010-2020
Unit of measure	Percentage of patents
Patent authority	European Patent Office (6F0)
Countries covered	EU27, MS, AC (except missing countries)
Missing countries	Albania, Kosovo, Montenegro, Serbia
Unit of measure	Percentage of patents
Reference area	Widening countries
Partner area	EU non widening countries
Missing countries	EU27, non-widening MS, Associated Countries

Indicator #50	Share of patents registered by a Widening country together with partners from other EU countries
Countries covered	Widening countries
Imputed years by country	2021 (widening countries)

Indicator #51	Share of enterprises that cooperated with RPOs located in other countries
Data source	Eurostat Data Browser
Dataset	Eurostat Community Innovation Survey - CIS
Time	2018, 2020
Survey round	CIS 2018
Dataset	Enterprises that co-operated on R&D and other innovation activities with other enterprises or organisations, by kind and location of co-operation partner, NACE Rev. 2 activity and size class (2018) - inn_cis11_coop
Last update	11/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Enterpises	Innovation active enterprises (INN)
Cooperation partners	Government, public or private research institutes (GOV_RI)
Unit of measure	Percentage
Size class	Total
Location of partners	[EU_EFTA]: EU or EFTA countries

[NEU_NEFTA]: Outside EU or EFTA countries |
| Missing countries | Albania, Armenia, Bosnia and Herzegovina, Georgia, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom |
| **Survey round** | CIS 2020 |

Dataset	Innovative enterprises that co-operated on R&D and other innovation activities with other enterprises or organisations, by kind and location of co-operation partner, NACE Rev. 2 activity and size class (2020) - inn_cis12_coop
Last update	12/07/2023
Statistical classification	Innovation core activities (Com. Reg. 995/2012) - (B-M73_INN)
Cooperation partners	Government, public or private research institutes (GOV_RI)
Unit of measure	Percentage
Size class	[EU_EFTA]: EU or EFTA countries [NEU_NEFTA]: Outside EU or EFTA countries
Location of partners	Total
Missing countries	Albania, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, Morocco, New Zealand, Serbia, North Macedonia, Tunisia, Ukraine, United Kingdom
Calculation rule	Mean value between the percentages collected for the different location partners, by country and year
Countries covered	EU27 (calculated manually as mean of MS values) , Member States, Iceland, Norway, Türkiye
Imputed years by country	2021 (EU27, MS, NO, TR), 2019 (EU27, MS, IS, NO, TR), 2017 (EU27, MS, IS, NO, TR)

Indicator #52	Share of public R&D expenditures financed by the private sector
Scoreboard indicator	#18

Indicator #53	Government budget allocations for R&D (GBARD) allocated to Europe-wide transnational, as well as bilateral or multilateral, public R&D programmes per FTE researcher
Scoreboard indicator	#19

4. Imputation

The following conservative rule for imputation has been implemented for missing values.

Missing values in **years-in-between**:

- Missing values are imputed only if there is maximum 1 year gap in the time series. The missing value is replaced by the mean of the two adjacent values. If the year gap is greater than 1, values are not imputed.

Examples:

	2017	2018	2019	2020	2021
Example 1					
Available data	20	NA	30	35	40
Imputed data	20	**25**	30	35	40
Example 2					
Available data	20	NA	NA	35	40
Imputed data	20	**NA**	**NA**	35	40

Missing values at the **beginning** of the time series:

- Missing values at the beginning of the series are imputed only for the year before the earliest available year. The missing value is replaced by the same value of the earliest available year.

Examples:

	2010	2012	2013	2014	2015
Example 1					
Available data	NA	NA	30	35	40
Imputed data	NA	**30**	30	35	40

Example 2					
Available data	NA	25	30	35	40
Imputed data	**25**	25	30	35	40

Missing values at the **end** of the time series:

- Missing values at the end of the series are imputed only for the year after the latest available year. The missing value is replaced by the same value of the latest available year.

Examples:

	2018	2019	2020	2021	2022
Example 1					
Available data	20	25	30	NA	NA
Imputed data	20	25	30	**30**	NA
Example 2					
Available data	20	25	30	35	NA
Imputed data	20	25	30	35	**35**

The final datasets for the ERA Scoreboard and ERA Dashboard 2024 contain the data with imputed values, following the above-described rules.

Annex – Country abbreviations

EU-27 Member States		Associated Countries	
ISO country code	**Country**	**ISO country code**	**Country**
AT	Austria	AL	Albania
BE	Belgium	AM	Armenia
BG	Bulgaria	BA	Bosnia and Herzegovina
HR	Croatia	GE	Georgia
CY	Cyprus	IS	Iceland
CZ	Czechia	IL	Israel
DK	Denmark	XK	Kosovo
EE	Estonia	MD	Moldova
FI	Finland	ME	Montenegro
FR	France	MA	Morocco
DE	Germany	NZ	New Zealand
EL	Greece	MK	North Macedonia
HU	Hungary	NO	Norway
IE	Ireland	RS	Serbia
IT	Italy	TN	Tunisia
LV	Latvia	TR	Türkiye
LT	Lithuania	UA	Ukraine
LU	Luxembourg	UK	United Kingdom
MT	Malta		
NL	Netherlands		
PL	Poland		
PT	Portugal		
RO	Romania		
SK	Slovakia		
SI	Slovenia		
ES	Spain		
SE	Sweden		

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