



European
Commission

European Innovation Scoreboard **2023** Country profile **Germany**



Innovation

European Innovation Scoreboard 2023 – Country profile Germany

European Commission

Directorate-General for Research and Innovation

Directorate G – Common Policy Centre

Unit G.1 – Common R&I Strategy & Foresight Service

Contact Alexandr Hobza, Chief Economist and Head of Unit G.1

Athina Karvounaraki

Alexis Stevenson

Email RTD-STATISTICS@ec.europa.eu

RTD-PUBLICATIONS@ec.europa.eu

Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs

Directorate A – Strategy and Economic Analysis

Unit A.1 – Chief Economist

Contact Román Arjona, Chief Economist and Head of Unit A.1

Xosé-Luís Varela-Irímia

Email GROW-A1@ec.europa.eu

European Commission

B-1049 Brussels

Manuscript completed in June 2023.

This document has been prepared for the European Commission; however it reflects the views only of the authors, and the European Commission shall not be liable for any consequence stemming from the reuse.

© European Union, 2023



The reuse policy of European Commission documents is implemented by Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Unless otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

For any use or reproduction of elements that are not owned by the European Union, permission may need to be sought directly from the respective rightsholders.

European Innovation Scoreboard 2023 Country profile Germany

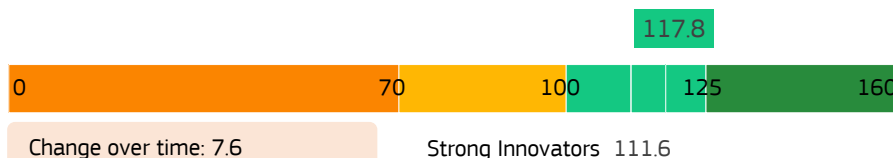
The report was prepared by

Hugo Hollanders, Nordine Es-Sadki and Aishe Khalilova
(Maastricht University / UNU-MERIT)

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

The European Innovation Scoreboard report and annexes, and the indicators database are available at:

https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en



Germany

	Performance relative to EU in 2023	Performance change 2016- 2023	Performance change 2022- 2023
SUMMARY INNOVATION INDEX	117.8	7.6	-1.3
Human resources	99.8	-3.4	-3.4
Doctorate graduates	159.3	-11.4	-11.4
Population with tertiary education	71.7	1.2	1.2
Lifelong learning	62.7	4.4	4.4
Attractive research systems	109.0	1.0	-1.3
International scientific co-publications	94.1	29.3	-2.6
Most cited publications	106.5	-10.1	-1.4
Foreign doctorate students	131.9	0.0	0.0
Digitalisation	86.5	19.8	10.8
Broadband penetration	101.3	38.9	21.2
People with above basic overall digital skills	66.1	0.0	0.0
Finance and support	91.8	23.3	-0.2
R&D expenditures in the public sector	143.8	16.1	-1.6
Venture capital expenditures	87.0	53.1	3.3
Government support for business R&D	36.6	1.7	-2.0
Firm investments	140.4	5.9	-3.4
R&D expenditure in the business sector	141.7	10.8	0.0
Non-R&D Innovation expenditures	133.5	4.6	-6.3
Innovation expenditures per employee	144.7	2.2	-4.1
Use of information technologies	120.9	-6.0	12.7
Enterprises providing ICT training	128.2	-15.9	22.3
Employed ICT specialists	113.3	3.4	3.4
Innovators	141.1	53.4	-11.5
Product innovators (SMEs)	131.4	6.1	-25.9
Business process innovators (SMEs)	149.5	103.7	3.9
Linkages	141.9	26.6	-7.6
Innovative SMEs collaborating with others	117.8	42.1	-19.2
Public-private co-publications	188.6	53.1	-1.0
Job-to-job mobility of HRST	141.7	0.0	0.0
Intellectual assets	122.0	-18.6	-6.9
PCT patent applications	137.6	-11.5	-2.8
Trademark applications	105.7	7.4	-3.6
Design applications	117.1	-48.1	-14.8
Employment impacts	128.4	4.2	-2.6
Employment in knowledge-intensive activities	101.2	0.0	0.0
Employment in innovative enterprises	150.8	8.1	-5.0
Sales impacts	117.5	5.8	0.5
Medium and high-tech goods exports	112.8	0.2	2.4
Knowledge-intensive services exports	133.6	12.6	4.1
Sales of innovative products	107.3	6.2	-6.9
Environmental sustainability	121.2	7.5	-0.7
Resource productivity	126.2	45.3	5.5
Air emissions by fine particulate matter	124.0	2.4	-0.6
Environment-related technologies	112.2	-11.9	-5.2

The second column shows performance relative to that of the EU in 2023. Colours next to the column show matching colour codes: dark green: above 125% of the performance of the EU in 2023; light green: between 100% and 125%; light orange: between 70% and 100%; dark orange: below 70%. The next columns show performance change over time between 2016 and 2023 and between 2022 and 2023, with scores relative to those of the EU in 2016. Positive (negative) performance changes are shown in green (red).

GERMANY is a **Strong Innovator** with performance at 117.8% of the EU average. Performance is above the average of the Strong Innovators. Performance is increasing at a rate lower than that of the EU (8.5%-points). The country's performance lead over the EU is becoming smaller.

Relative strengths

Public-private co-publications
 Doctorate graduates
 Employment in innovative enterprises
 Business process innovators
 Innovation expenditures per employee

Relative weaknesses

Government support for business R&D
 Lifelong learning
 People with above basic overall digital skills
 Population with tertiary education
 Venture capital expenditures

Strong increases since 2016

Business process innovators
 Public-private co-publications
 Venture capital expenditures

Strong decreases since 2016

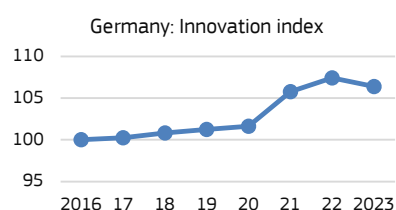
Design applications
 Enterprises providing ICT training
 Environment-related technologies

Strong increases since 2022

Enterprises providing ICT training
 Broadband penetration
 Resource productivity

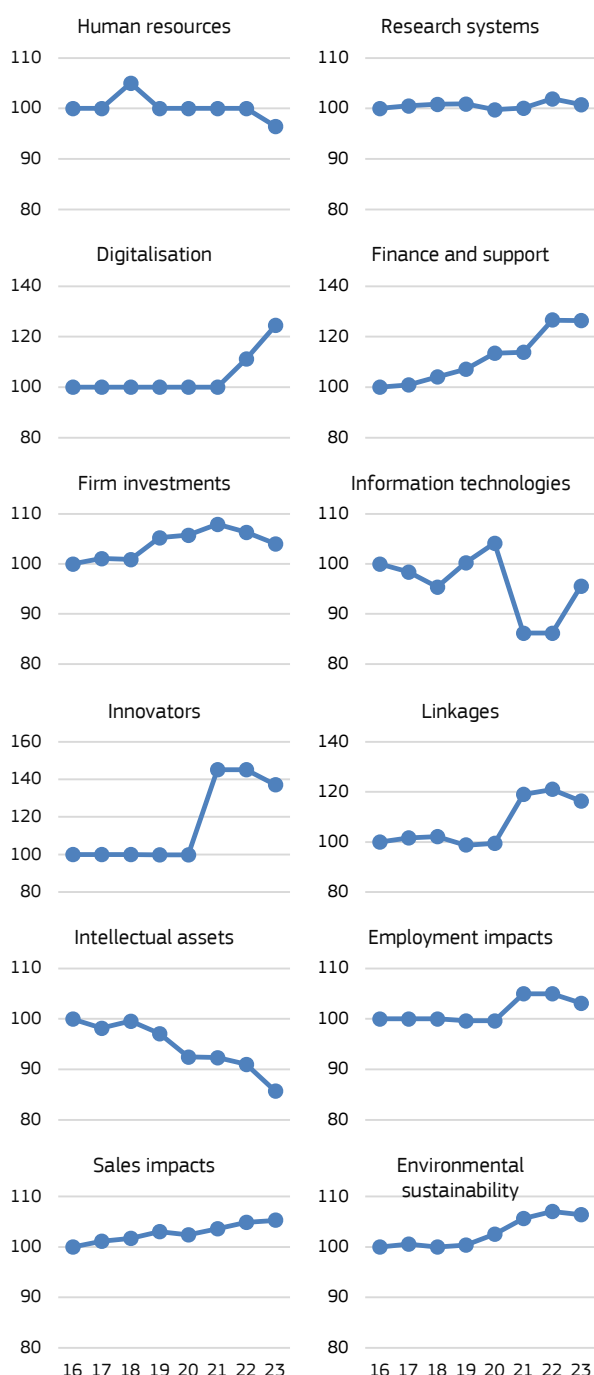
Strong decreases since 2022

Product innovators
 Innovative SMEs collaborating with others
 Design applications



The graph on the left shows the evolution of **innovation performance over time** against the performance of the country in 2016. Innovation performance did not change much between 2016 and 2020 and increased strongly in 2021. After a moderate increase in 2022, performance declined in 2023.

The graphs below show the evolution of innovation performance in the different **innovation dimensions** against the performance of the country in 2016. Performance increased strongly for Digitalisation, Finance and support and Innovators, and did decline for Human resources, Information technologies and Intellectual assets.





Performance is measured relative to that of the country in 2016 (=100).

Structural differences with the EU are shown below:

- Germany has higher per capita income but a slower growing economy. Manufacturing takes up a higher share of the economy, with large enterprises accounting for a larger share of turnover.
- FDI inflows, Top R&D spenders and buyer sophistication add positively to the innovation climate, enterprise births and entrepreneurial activities add negatively.
- Germany has above average shares of In-house product innovators without market novelties and In-house business process innovators.
- Government procurement is above the EU average as driver of research and innovation while most other Governance and policy framework indicators are at par with the EU.
- Germany shows a mixed performance on Climate change related indicators with above average performance on innovation but a below average reduction of greenhouse gas emissions.

	DE	EU
Performance and structure of the economy		
GDP per capita (PPS)	39,000	32,600
Average annual GDP growth (%)	1.8	4.4
Employment share Manufacturing (NACE C) (%)	19.7	16.4
of which High and Medium high-tech (%)	51.3	38.0
Employment share Services (NACE G-N) (%)	38.9	41.1
of which Knowledge-intensive services (%)	36.1	35.8
Turnover share SMEs (%)	29.0	34.1
Turnover share large enterprises (%)	61.2	49.6
Foreign-controlled enterprises – share of value added (%)	10.3	11.8
Business and entrepreneurship		
Enterprise births (10+ employees) (%)	0.7	1.0
Total Entrepreneurial Activity (TEA) (%)	6.4	6.8
FDI net inflows (% GDP)	2.4	2.1
Top R&D spending enterprises per 10 mln. population	31.7	20.3
Buyer sophistication (1 to 7 best)	4.6	3.7
Innovation profiles		
In-house product innovators with market novelties	8.5	12.2
In-house product innovators without market novelties	20.7	12.8
In-house business process innovators	23.8	16.5
Innovators that do not develop innovations themselves	10.0	6.5
Innovation active non-innovators	5.6	4.1
Non-innovators with potential to innovate	18.5	17.2
Non-innovators without disposition to innovate	12.9	30.7
Governance and policy framework		
Corruption Perceptions Index (0 to 100 best)	79.7	64.0
Basic school entrepreneurial education and training	3.2	3.3
Govt. procurement of advanced tech. products	4.6	3.5
Rule of law (-2.5 to 2.5 best)	1.6	1.0
Climate change indicators		
Circular material use rate	12.8	11.8
Greenhouse gas emissions intensity of energy consumption	86.8	82.8
Eco-Innovation Index	116.2	100.0
Demography		
Population size	83.2	447.1
Average annual population growth (%)	0.0	-0.1
Population density	234.6	108.8



This report provides the Country profile from the 2023 European Innovation Scoreboard for Germany.

Studies and reports