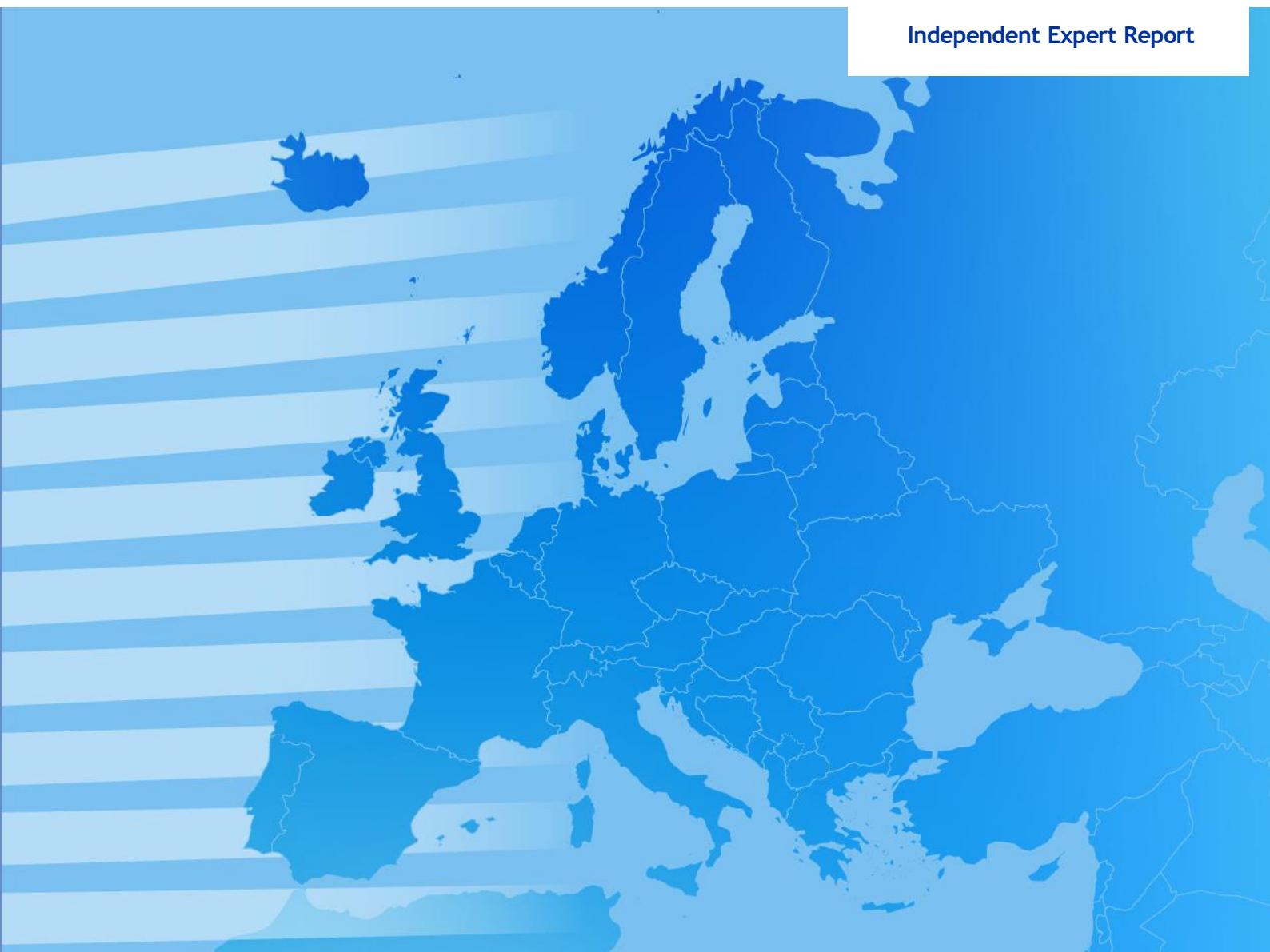


# European Innovation Scoreboard 2025

## Country profile Germany

Independent Expert Report



## **European Innovation Scoreboard 2025 – Country profile Germany**

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# European Innovation Scoreboard 2025

Country profile Germany

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## GERMANY

### Strong Innovator ●

Summary innovation index (indexed to EU in 2025): **111.1**

Change vs 2018: ▲ +8.7 Change vs 2024: ▼ -2.1

#### Current benchmarking

Indicator	Performance indexed to the EU in 2025	Rank among EU Member States
<b>SUMMARY INNOVATION INDEX</b>	<b>111.1</b>	<b>9</b>
Human resources	96.3	16
New doctorate graduates	139.2	2
Population with tertiary education	76.3	20
Population involved in lifelong learning	68.5	23
<b>Attractive research systems</b>	<b>103.2</b>	<b>15</b>
International scientific co-publications	92.2	16
Scientific publications among the top 10% most cited	107.5	11
Foreign doctorate students as a % of all doctorate students	106.8	16
<b>Digitalisation</b>	<b>82.8</b>	<b>22</b>
High-speed internet access	93.1	20
Individuals with above basic overall digital skills	67.7	23
<b>Finance and support</b>	<b>92.0</b>	<b>11</b>
R&D expenditure in the public sector	133.3	4
Venture capital expenditures	94.5	12
Direct and indirect government support of business R&D	41.9	16
<b>Firm investments</b>	<b>143.4</b>	<b>2</b>
R&D expenditure in the business sector	143.4	4
Non-R&D innovation expenditures	140.9	3
Innovation expenditures per person employed	145.0	5
<b>Investments in information technologies</b>	<b>105.8</b>	<b>13</b>
Cloud Computing	104.3	13
Employed ICT specialists	107.7	9
<b>Innovators</b>	<b>117.0</b>	<b>8</b>
SMEs introducing product innovations	105.1	16
SMEs introducing business process innovations	126.6	4
<b>Linkages</b>	<b>130.4</b>	<b>11</b>
Innovative SMEs collaborating with others	88.2	16
Public-private co-publications	188.5	12
Job-to-job mobility of HRST	141.7	6
<b>Intellectual assets</b>	<b>119.3</b>	<b>7</b>
PCT patent applications	134.2	4
Trademark applications	102.3	17
Design applications	113.8	8
<b>Sales and employment impacts</b>	<b>125.3</b>	<b>4</b>
Sales of new-to-market and new-to-firm innovations	105.3	10
Employment in innovative enterprises	142.7	2
<b>Trade impacts</b>	<b>104.9</b>	<b>1</b>
Exports of medium and high-tech products	109.0	6
Knowledge-intensive services exports	103.8	7
High-tech imports from outside the EU	101.6	2
<b>Resource and labour productivity</b>	<b>117.4</b>	<b>11</b>
Resource productivity	127.4	9
Production-based CO2 productivity	90.3	18
Labour productivity	141.6	7

Germany is a Strong Innovator, performing at 111.1% of the EU average in 2025.

It ranks 9th among EU Member States, and 13th among the EU and neighbouring countries.

Its performance is below the average of Strong Innovators in the EU (111.1% vs 114.1% of the EU average in 2025).

#### Relative strengths

- Public-private co-publications
- Innovation expenditures per person employed
- R&D expenditure in the business sector

#### Relative weaknesses

- Direct and indirect government support of business R&D
- Individuals with above basic overall digital skills
- Population involved in lifelong learning

#### Highest ranked indicators among EU Member States

- Employment in innovative enterprises
- New doctorate graduates
- High-tech imports from outside the EU

#### Lowest ranked indicators among EU Member States

- Individuals with above basic overall digital skills
- Population involved in lifelong learning
- Population with tertiary education

**Footnote:** Scores are indexed to the EU average in 2025. Relative strengths (purple) and weaknesses (red) refer to the three indicators where the country's scores are furthest above or below the EU average in 2025. These highlight the areas where the country stands out most positively or faces the greatest relative challenges compared to the EU. The highest (purple) and lowest (red) ranked indicators are those where the country achieves its highest and lowest ranks among EU Member States. These show how the country compares to others, regardless of the EU average, by indicating its best and worst positions in the rankings. Relative performance compared to the EU average in 2025 is indicated using the following colour legend:



## Performance trends

Indicator	Performance indexed to the EU in 2018	Performance change 2018-2025	Performance change 2024-2025
<b>SUMMARY INNOVATION INDEX</b>	<b>125.1</b>	<b>+8.7</b>	<b>-2.1</b>
<b>Human resources</b>	<b>102.8</b>	<b>-3.9</b>	<b>-0.9</b>
New doctorate graduates	123.1	-23.1	-11.6
Population with tertiary education	89.4	+19.9	+13.2
Population involved in lifelong learning	85.6	0	0
<b>Attractive research systems</b>	<b>116.7</b>	<b>0</b>	<b>+1.6</b>
International scientific co-publications	125.8	+24.8	+6.4
Scientific publications among the top 10% most cited	102.1	-11.7	-1.9
Foreign doctorate students as a % of all doctorate students	139.2	+2.0	+3.9
<b>Digitalisation</b>	<b>118.6</b>	<b>+60.6</b>	<b>+9.0</b>
High-speed internet access	180.0	+132.1	+15.1
Individuals with above basic overall digital skills	70.3	+4.2	+4.2
<b>Finance and support</b>	<b>104.2</b>	<b>+13.0</b>	<b>-6.4</b>
R&D expenditure in the public sector	135.6	-1.7	-1.7
Venture capital expenditures	137.2	+62.0	-33.4
Direct and indirect government support of business R&D	46.8	+6.7	+2.3
<b>Firm investments</b>	<b>145.0</b>	<b>-0.7</b>	<b>-0.7</b>
R&D expenditure in the business sector	155.2	+11.2	+3.7
Non-R&D innovation expenditures	111.3	-15.9	-16.4
Innovation expenditures per person employed	163.8	+0.3	+8.0
<b>Investments in information technologies</b>	<b>181.9</b>	<b>+79.4</b>	<b>+20.9</b>
Cloud Computing	330.3	+252.0	+44.3
Employed ICT specialists	123.4	+11.7	+11.7
<b>Innovators</b>	<b>135.5</b>	<b>+10.9</b>	<b>-31.0</b>
SMEs introducing product innovations	108.9	-22.2	-41.3
SMEs introducing business process innovations	161.3	+43.0	-21.0
<b>Linkages</b>	<b>177.2</b>	<b>+18.1</b>	<b>-11.2</b>
Innovative SMEs collaborating with others	121.7	+31.1	-29.4
Public-private co-publications	229.6	+33.7	-2.4
Job-to-job mobility of HRST	200.0	0	0
<b>Intellectual assets</b>	<b>99.0</b>	<b>-27.6</b>	<b>-9.2</b>
PCT patent applications	117.0	-14.7	-6.0
Trademark applications	98.4	-7.7	-11.2
Design applications	77.7	-57.8	-11.4
<b>Sales and employment impacts</b>	<b>127.2</b>	<b>-4.4</b>	<b>-8.5</b>
Sales of new-to-market and new-to-firm innovations	100.9	-7.1	-7.2
Employment in innovative enterprises	152.6	-1.7	-9.7
<b>Trade impacts</b>	<b>106.7</b>	<b>-2.6</b>	<b>-0.4</b>
Exports of medium and high-tech products	110.0	-3.5	-2.5
Knowledge-intensive services exports	108.2	+5.6	+5.0
High-tech imports from outside the EU	101.8	-9.4	-3.2
<b>Resource and labour productivity</b>	<b>156.7</b>	<b>+40.7</b>	<b>+15.5</b>
Resource productivity	175.5	+57.7	+22.8
Production-based CO2 productivity	142.9	+57.9	+22.7
Labour productivity	148.0	+4.3	-0.2

Summary innovation index (indexed to EU in 2018): **125.1**

Performance since 2018 is increasing less than the EU (+8.7%-points vs +12.6%-points for the EU).

### Strong increases since 2018

- Cloud Computing
- High-speed internet access
- Venture capital expenditures

### Strong decreases since 2018

- Design applications
- New doctorate graduates
- SMEs introducing product innovations

### Strong increases since 2024

- Cloud Computing
- Resource productivity
- Production-based CO2 productivity

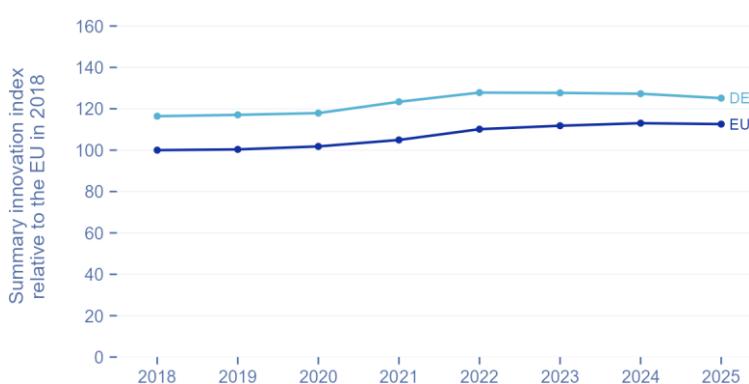
### Strong decreases since 2024

- SMEs introducing product innovations
- Venture capital expenditures
- Innovative SMEs collaborating with others

**Footnote:** Scores are indexed to the EU in 2018. Changes over time are shown in purple (positive) and red (negative).

**Note on performance score:** A value of 0 in the Current Benchmarking or Performance Trend tables means that the country had the lowest performance for that indicator, or was identified as a negative outlier and rescaled to 0 during the rescaling phase (see Methodology Report for details). Multiple countries can receive a score of 0 for the same indicator. If multiple countries receive the same score, they share the same rank. As a result, the lowest rank (e.g. 27 or 39) may not always appear.

## Performance indicators



### Summary innovation index

The line chart shows the evolution of the innovation performance of Germany over time, indexed to the performance of the EU in 2018.

**Footnote:** All performance scores (SII and dimensions below) are indexed to the EU in 2018.

## Framework conditions

Germany's framework conditions for innovation present a mixed picture in 2025. The country continues to perform strongly on new doctorate graduates, scoring 139.2% of the 2025 EU average and ranking 4th among EU and neighbouring countries. However, other human capital indicators have weakened: population with tertiary education (76.3% of 2025 EU average) and the number of populations involved in lifelong learning at 68.5%, one of the lowest scores in the EU.

Germany maintains an average research system, with international scientific co-publications (92.2% of 2025 EU average) and top 10% most cited publications (107.5%) performing close to or above the EU average. However, its score in this dimension (103.2%) reflects only a modest improvement since 2018, with declines in scientific publications among the top 10%. Digitalisation remains a relative weakness. For further details on Germany's research and innovation system see also Annex 3 of the European Semester Country Report 2025.

Despite Germany's economic strength, its digitalisation performance remains below the EU average in 2025, with a score of just 82.8% and a rank of 26th among the EU and neighbouring countries. The Digital Decade Country Report highlights persistent gaps in the rollout of very high-capacity networks, particularly in rural areas, and limited progress in digitalising public services (European Commission, 2024a). The DESI assessments further note that while Germany performs relatively well on connectivity, it lags in digital uptake among SMEs and in the availability of digital public services (European Commission, 2023).

### Human resources



### Attractive research systems



### Digitalisation



## Investments

Germany demonstrates strong investment performance in 2025, particularly in firm-level innovation. The country ranks 3rd in the EU for firm investments overall (143.4% of the EU average in 2025), with innovation expenditures per person employed, R&D expenditure in the business sector, non-R&D innovation expenditures all scoring 145.0%, 143.4%, and 140.9% of the EU average in 2025, respectively. This sustained leadership is consistent with Germany's longstanding R&D-intensive industrial model, enabled by initiatives such as the Future Strategy for Research and Innovation which has supported corporate research through tax incentives and direct funding. This good performance is supported by Germany's industrial-driven model, which contributes nearly half of the EU's top R&D investors, as shown in the 2024 EU Industrial R&D Investment Scoreboard (JRC, 2024).

However, the investments in information technologies are relatively weaker in comparison to its industrial R&D strengths. Germany's investments in information technologies index sit at 105.8% of the EU average in 2025, with cloud computing (104.4%) and employed ICT specialists (107.7%). However there has been improvements in this dimension with it growing 20.9%-points in the past year and 79.4%-points since 2018.

The finance and support dimension reveals a more mixed picture. While public R&D expenditure remains relatively high (at 133.3%), venture capital has grown since 2018 (+137.2%-points) and has fallen substantially over the last year (-33.4%-points) to reach 94.5% of the EU average in 2025. This underperformance partly reflects persistent structural challenges in Germany's risk capital markets and limited scale-up funding for high-growth firms.

### Finance and support



### Firm investments



### Investments in information tech



### Innovation activities

Germany performs strongly on Innovation activities, with scores exceeding the EU average across all three dimensions. The country scores 117.0% of the EU 2025 average for Innovators, driven by a relatively high share of SMEs introducing business process innovations (126.6% of EU average in 2025), although this represents a decline of 21.0%-points since 2024. In contrast, SMEs introducing product innovations (105.1% of the EU average) have also decreased (-41.3%-points).

Linkages remain robust overall (130.4% of the EU average), visible particularly in public-private co-publications (188.5%) and job-to-job mobility of human resources in science and technology (141.7%). However, collaboration among innovative SMEs (88.2%) is below the EU average and declined by 29.4%-points since 2024. Intellectual assets show above-average performance, at 119.3%, with Germany ranking among the top five EU27 Member States for PCT patent applications (134.2%) and design applications (113.8%). Still, these values have dropped since 2024.

### Innovators



### Linkages



### Intellectual assets



### Impacts

Germany continues to perform strongly across all impact dimensions, maintaining scores above the EU average in 2025. On Sales and employment impacts, Germany scores 125.3% of the EU average in 2025, supported by particularly high employment in innovative enterprises (142.7%, ranked 2nd in the EU). While this marks a decline of 9.7%-points since 2024, Germany's innovation system still delivers robust employment outcomes. Sales of new-to-market and new-to-firm innovations are also above average (105.3% of the EU average in 2025), though this indicator has also slightly decreased since 2024 (-7.2%-points). These declines reflect a broader moderation from peak values but still place Germany among the strongest innovation economies in terms of employment output.

Germany ranks first in the EU on the trade impacts dimension, at 104.9% of the EU average in 2025, driven by consistently strong performance in exports of medium and high-tech products (109.0%) and high-tech imports from non-EU partners (101.6%). Knowledge-intensive services exports (103.8%) have grown steadily (+5.6%-points since 2018), reflecting Germany's dual strength in industrial and service innovation. While Germany remains above the 2025 EU average in the Resource and labour productivity dimension (117.4%), all three underlying indicators, resource productivity (127.4%), labour productivity (141.6%), and CO<sub>2</sub> productivity (90.3%), however all have been on a strong upward trend since 2018.

### Sales and employment impacts



### Trade impacts



### Resource and labour productivity



## Structural differences

The table below presents some structural differences between Germany and the EU.

	DE	EU
<b>Performance and structure of the economy</b>		
GDP per capita (2022-2024 average)	116.3	100
Average annual GDP growth (2022-2024 average)	-0.3	0.8
Employment share Manufacturing (2022-2024 average)	18.5	15.6
Employment share High and Medium high-tech (2022-2024 average)	51.1	38.1
Employment share Services (2021-2024 average)	38.5	40.2
Employment share Knowledge-intensive services (2022-2024 average)	28.5	28.5
Turnover share SMEs (2018-2020 average)	9.7	12.6
Turnover share large enterprises (2018-2020 average)	61.2	49.6
Foreign-controlled enterprises – share of value added (2018-2020 average)	12.1	13.3
Herfindahl-Hirschman Index of non-EU imports of high-tech goods (2022-2024)	0.1	N/A
<b>Business and entrepreneurship</b>		
Enterprise births (2018-2020 average)	0.7	0.8
Total Entrepreneurial Activity (2022-2024 average)	8.9	7.1
FDI net inflows (2021-2023 average)	1.4	1
Top R&D spending enterprises (2022-2024 average)	13.3	N/A
Buyer sophistication (2015-17 average)	4.3	3.6
Digital Intensity Index (2024)	41.6	34.2
Young High Growth Enterprises (2022)	0.7	0.8
<b>Innovation profiles</b>		
In-house product innovators with market novelties (2020)	8.5	11.7
In-house product innovators without market novelties (2020)	20.7	13.7
In-house business process innovators (2020)	23.8	17.6
Innovators that do not develop innovations themselves (2020)	10	6.1
Innovation active non-innovators (2020)	5.6	4.2
Non-innovators with potential to innovate (2020)	18.5	17.8
Non-innovators without disposition to innovate (2020)	12.9	30.6
HEU funding intensity per researcher (2022-2024 average)	4657	6194
<b>Governance and policy frameworks</b>		
Corruption Perceptions Index (2022-24 average)	77.3	63.3
Basic-school entrepreneurial education and training (2022-24 average)	2.5	2.4
Rule of law (2021-23 average)	1.6	1
Innovation procurement as a share of total public procurement (2024)	9.4	9.2
<b>Environment</b>		
Circular material use rate (2021-23 average)	12.9	11.5
Greenhouse gas emissions intensity of energy consumption (2018-20 average)	86.8	82.8
Eco-Innovation Index (2024)	140.7	127.5
<b>Demography</b>		
Population size (2022-24 average, in millions)	83.3	447.7
Average annual population growth (2022-24 average)	0.1	0.4
Population density (2022-24 average)	235.6	109.1



### Performance and structure of the economy

Germany's economic structure is marked by a high GDP per capita (116.3 vs 100 for the EU) but stagnant growth, with average annual GDP shrinking slightly between 2022 and 2024 (-0.3% vs +0.8% for the EU). The country's industrial base remains strong, with 18.5% of employment in manufacturing and 51.1% in high and medium high-tech sectors, significantly above the EU average (15.6% and 38.1%, respectively). However, Germany's service sector is comparatively smaller, with lower shares in both overall services (38.5%) and equal performance in knowledge-intensive services (28.5%). The economy is heavily dominated by large enterprises, which account for 61.2% of turnover, much higher than the EU average (49.6%), and has a relatively low share of value added by foreign-controlled firms (12.1%).



## Business and entrepreneurship

Germany displays moderate entrepreneurial activity. While enterprise birth rates are slightly below the EU average (0.7 vs 0.8), its total entrepreneurial activity is comparatively high (8.9% vs EU 7.1%), likely supported by strong digital uptake (Digital Intensity Index: 41.6 vs EU 34.2) and above-average buyer sophistication (4.3 vs 3.6). However, the share of young high-growth enterprises is marginally below the EU average (0.7% vs 0.8%). The country continues to host a significant share of Europe's top R&D-spending firms (13.3% of the EU total), reflecting the strength of its industrial research base and advanced manufacturing sectors.



## Innovation profiles

Germany's innovation landscape shows a strong focus on internal development. The share of in-house business process innovators (23.8%) and in-house product innovators without market novelties (20.7%) significantly exceeds the EU average (17.6% and 13.7%, respectively). In contrast, the share of in-house innovators with market novelties is lower (8.5% vs 11.7%), indicating a tendency toward incremental rather than radical innovation. A relatively high share of firms is innovation active but do not develop innovations themselves (10% vs EU 6.1%), while non-innovators with no disposition to innovate is unusually low (12.9% vs 30.6%). Germany also scores below the EU average in Horizon Europe (HEU) funding per researcher (€4,657 vs €6,194).



## Governance and policy frameworks

Germany exhibits strong governance fundamentals. Its average Corruption Perceptions Index score (77.3) and Rule of Law index (1.6) both outperform the EU averages (63.3 and 1, respectively), reinforcing its reputation for institutional reliability. Entrepreneurial education at the basic school level aligns with the EU average (2.5 vs 2.4), while public innovation procurement accounts for 9.4% of total procurement, slightly above the EU average (9.2%), suggesting active government involvement in market-shaping innovation support.



## Environment

Germany performs well on most environmental indicators. Its circular material use rate (12.9%) is above the EU average (11.5%), and it leads on the Eco-Innovation Index with a score of 140.7 (vs 127.5 EU average). However, its greenhouse gas emissions intensity of energy consumption is slightly higher than the EU average (86.8 vs 82.8), indicating room for improvement in decarbonising the energy mix despite advances in circular economy and eco-innovation performance.



## Demography

Germany's demographic profile reflects maturity and high density. With a population of 83.3 million, it is the largest in the EU, but population growth remains marginal (0.1% vs 0.4% EU average). Population density is more than double the EU average (235.6 vs 109.1), which can pose challenges in terms of urban sustainability, service delivery, and infrastructure capacity. These dynamics have implications for labour market renewal, innovation talent, and housing policy in the medium to long term.

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This report provides the Country profile from the 2025 European Innovation Scoreboard for Germany

*Studies and reports*