



45.6



Emerging Innovators 50.0

Change over time: 12.0

North Macedonia	Performance relative to EU in 2022	Performance change 2015-2022	Performance change 2021-2022
SUMMARY INNOVATION INDEX	45.6	12.0	3.1
Human resources	34.1	-6.6	0.0
Doctorate graduates	11.0	-11.4	0.0
Population with tertiary education	78.6	0.0	0.0
Lifelong learning	8.9	-6.7	0.0
Attractive research systems	76.6	73.2	7.7
International scientific co-publications	19.7	16.4	2.5
Most cited publications	34.4	23.4	2.2
Foreign doctorate students	228.7	234.8	24.3
Digitalisation	47.0	1.6	1.6
Broadband penetration	69.2	3.0	3.0
People with above basic overall digital skills	18.2	0.0	0.0
Finance and support	15.5	-4.3	3.8
R&D expenditures in the public sector	24.2	-12.9	3.2
Venture capital expenditures	N/A	N/A	N/A
Government support for business R&D	6.8	7.7	4.2
Firm investments	40.6	0.5	0.0
R&D expenditure in the business sector	3.4	1.6	0.0
Non-R&D Innovation expenditures	114.5	0.0	0.0
Innovation expenditures per employee	14.4	0.0	0.0
Use of information technologies	26.1	-6.5	-16.3
Enterprises providing ICT training	50.0	-12.5	-31.3
Employed ICT specialists	0.0	0.0	0.0
Innovators	60.0	5.3	0.0
Product innovators (SMEs)	49.2	-4.8	0.0
Business process innovators (SMEs)	69.5	16.0	0.0
Linkages	49.5	34.7	-16.3
Innovative SMEs collaborating with others	46.0	-11.4	0.0
Public-private co-publications	25.5	17.4	8.3
Job-to-job mobility of HRST	62.5	82.4	-41.2
Intellectual assets	19.1	6.5	2.5
PCT patent applications	30.0	11.3	2.1
Trademark applications	22.7	7.1	6.6
Design applications	0.5	0.4	0.0
Employment impacts	28.0	0.0	0.0
Employment in knowledge-intensive activities	11.7	0.0	0.0
Employment in innovative enterprises	41.0	0.0	0.0
Sales impacts	64.2	17.1	2.9
Medium and high-tech goods exports	122.2	23.8	0.0
Knowledge-intensive services exports	40.6	24.4	8.6
Sales of innovative products	22.6	0.0	0.0
Environmental sustainability	86.8	30.1	41.8
Resource productivity	39.6	19.0	-3.0
Air emissions by fine particulate matter	N/A	N/A	N/A
Environment-related technologies	161.8	44.8	82.1

The second column shows performance relative to that of the EU in 2022. Colours next to the column show matching colour codes: dark green: above 125% of the performance of the EU in 2022; light green: between 100% and 125%; yellow: between 70% and 100%; orange: below 70%. Normalised performance uses the data after a possible imputation of missing data and transformation of the data. The next columns show performance change over time between 2015 and 2022 and between 2021 and 2022, with scores relative to those of the EU in 2015. Positive performance changes are shown in green, negative performance changes in red.

NORTH MACEDONIA is an **Emerging Innovator** with performance at 45.6% of the EU average. Performance is below the average of the Emerging Innovators (50.0%). Performance is increasing (12.0%-points) at a rate higher than that of the EU (9.9%-points). The country's performance gap to the EU is becoming smaller.

Relative strengths

- Foreign doctorate students
- Environment-related technologies
- Medium and high-tech goods exports
- Non-R&D Innovation expenditures
- Population with tertiary education

Relative weaknesses

- Employed ICT specialists
- Design applications
- R&D expenditure in the business sector
- Government support for business R&D
- Lifelong learning

Strong increases since 2015

- Foreign doctorate students
- Job-to-job mobility of HRST
- Environment-related technologies

Strong decreases since 2015

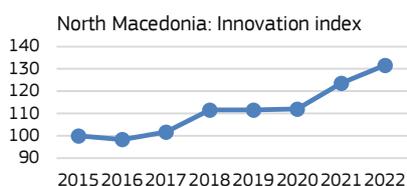
- R&D expenditures in the public sector
- Enterprises providing ICT training
- Doctorate graduates

Strong increases since 2021

- Environment-related technologies
- Foreign doctorate students
- Knowledge-intensive services exports

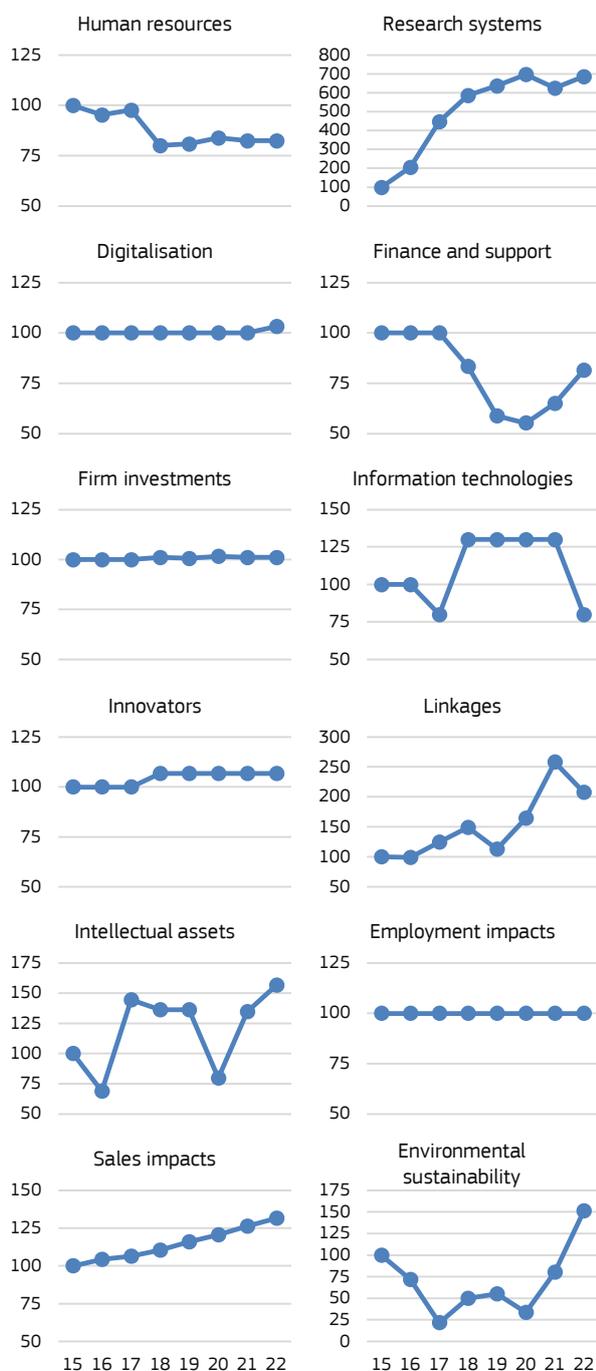
Strong decreases since 2021

- Job-to-job mobility of HRST
- Enterprises providing ICT training
- Resource productivity



The graph on the left shows the evolution of **innovation performance over time** against the performance of the country in 2015. Innovation performance started to increase in 2017 with further strong increases in 2018, 2021 and 2022, leading to an overall improvement of 32% between 2015 and 2022.

The graphs below show the evolution of innovation performance in the different **innovation dimensions** against the performance of the country in 2015. Performance increased strongest for Research systems, Linkages, Intellectual assets and Environmental sustainability and declined for Human resources, Finance and support and Information technologies.



Structural differences with the EU are shown below:

- North Macedonia has lower per capita income. Manufacturing takes up a larger share of the economy, with SMEs accounting for a larger share of turnover.
- FDI net inflows add positively to the innovation climate, entrepreneurial activity and the absence of top R&D spenders add negatively.
- Information on Innovation profiles is not available.
- Ease of starting a business is above the EU average and entrepreneurial training and government procurement are above the EU average as drivers of research and innovation.
- Information on Climate change related indicators is not available.

	MK	EU
Performance and structure of the economy		
GDP per capita (PPS)	11,100	31,200
Average annual GDP growth (%)	n/a	-0.4
Employment share Manufacturing (NACE C) (%)	19.9	16.4
of which High and Medium high-tech (%)	25.4	38.0
Employment share Services (NACE G-N) (%)	33.0	41.1
of which Knowledge-intensive services (%)	21.8	35.8
Turnover share SMEs (%)	43.2	34.8
Turnover share large enterprises (%)	34.6	48.2
Foreign-controlled enterprises – share of value added (%)	n/a	11.7
Business and entrepreneurship		
Enterprise births (10+ employees) (%)	n/a	1.0
Total Entrepreneurial Activity (TEA) (%)	6.2	7.3
FDI net inflows (% GDP)	3.2	1.0
Top R&D spending enterprises per 10 mln. population	0.0	18.3
Buyer sophistication (1 to 7 best)	2.9	3.7
Innovation profiles		
In-house product innovators with market novelties	n/a	10.7
In-house product innovators without market novelties	n/a	12.3
In-house business process innovators	n/a	11.0
Innovators that do not develop innovations themselves	n/a	11.6
Innovation active non-innovators	n/a	3.3
Non-innovators with potential to innovate	n/a	19.9
Non-innovators without disposition to innovate	n/a	31.3
Governance and policy framework		
Ease of starting a business (0 to 100 best)	80.6	76.5
Basic school entrepreneurial education and training	3.4	3.5
Govt. procurement of advanced tech. products	2.7	3.5
Rule of law (-2.5 to 2.5 best)	n/a	1.1
Climate change indicators		
Circular material use rate	n/a	12.2
Greenhouse gas emissions intensity of energy consumption	n/a	82.8
Eco-Innovation Index	n/a	100.0
Demography		
Population size	2.1	447.0
Average annual population growth (%)	-0.2	0.1
Population density	83.4	108.8

Performance is measured relative to that of the country in 2015 (=100).