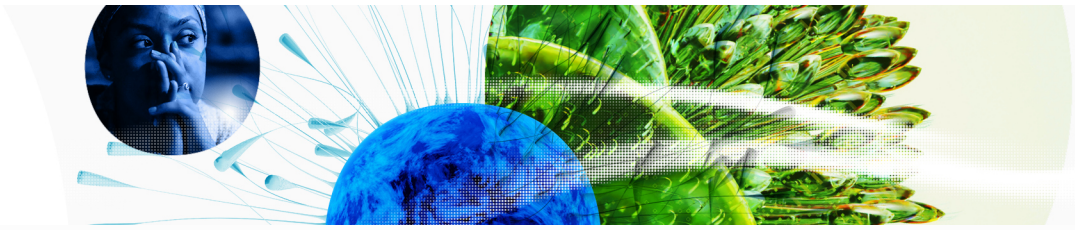
Global Innovation Index 2023



The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation**.

Montenegro ranking in the Global Innovation Index 2023

> Montenegro ranks 75th among the 132 economies featured in the GII 2023.

> Montenegro ranks 20th among the 33 upper-middle-income group economies.

> Montenegro ranks 36th among the 39 economies in Europe.

> Montenegro GII Ranking (2020-2023)

The table shows the rankings of Montenegro over the past four years. Data availability and changes to the GII model framework influence year-on-year comparisons of the GII rankings. The statistical confidence interval for the ranking of Montenegro in the GII 2023 is between ranks 70 and 77.

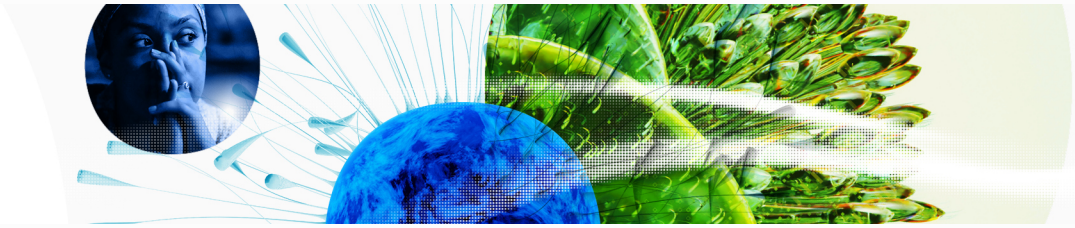
	GII Position	Innovation Inputs	Innovation Outputs
2020	49th	53rd	49th
2021	50th	53rd	53rd
2022	60th	51st	72nd
2023	75th	62nd	83rd

Montenegro performs worse in innovation outputs than innovation inputs in 2023.

This year Montenegro ranks 62nd in innovation inputs. This position is lower than last year.

Montenegro ranks 83rd in innovation outputs. This position is lower than last year.

Global Innovation Index 2023



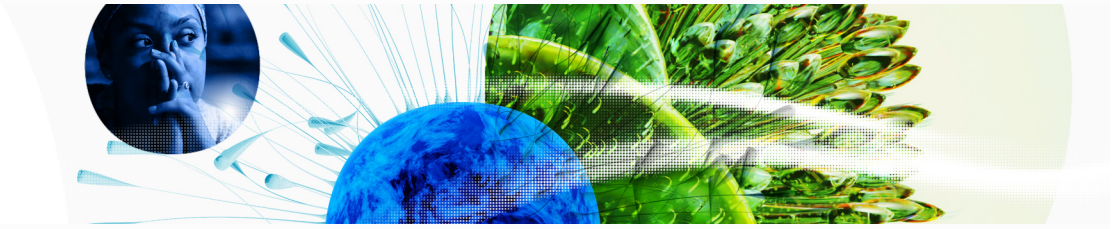
→ Expected vs. observed innovation performance

The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are performing below expectations.

> Relative to GDP, Montenegro's performance is below expectations for its level of development.

> Innovation overperformers relative to their economic development

Global Innovation Index 2023

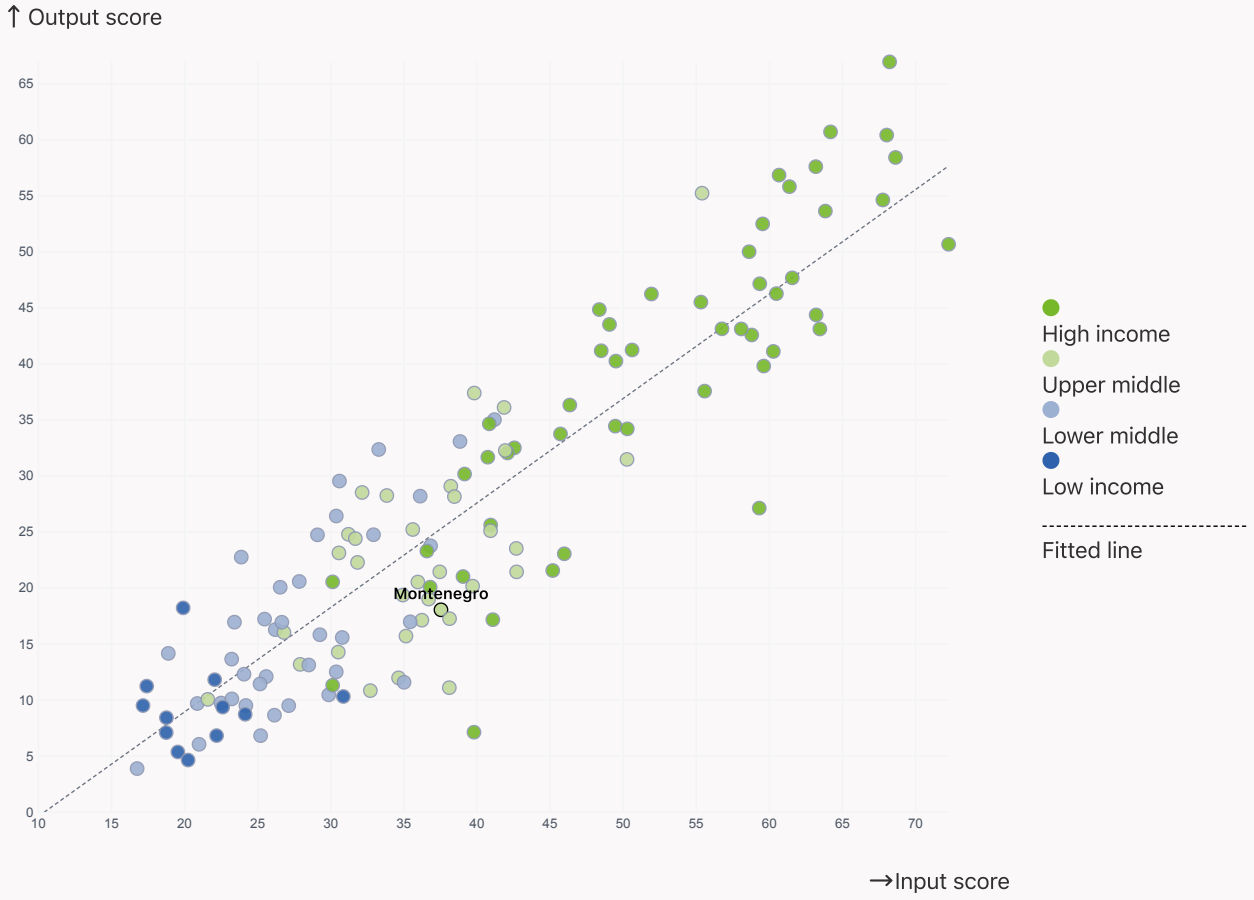


→ Effectively translating innovation investments into innovation outputs

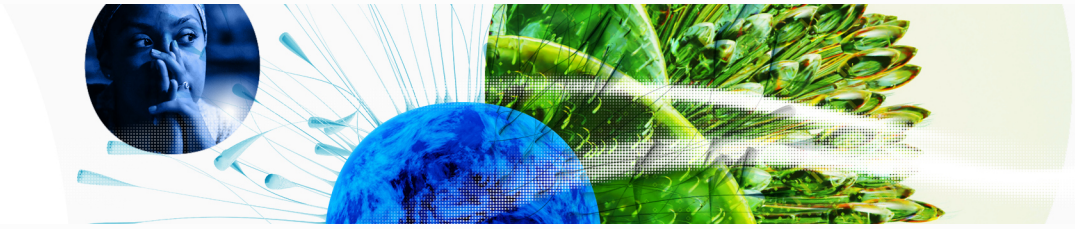
The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

> Montenegro produces less innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs

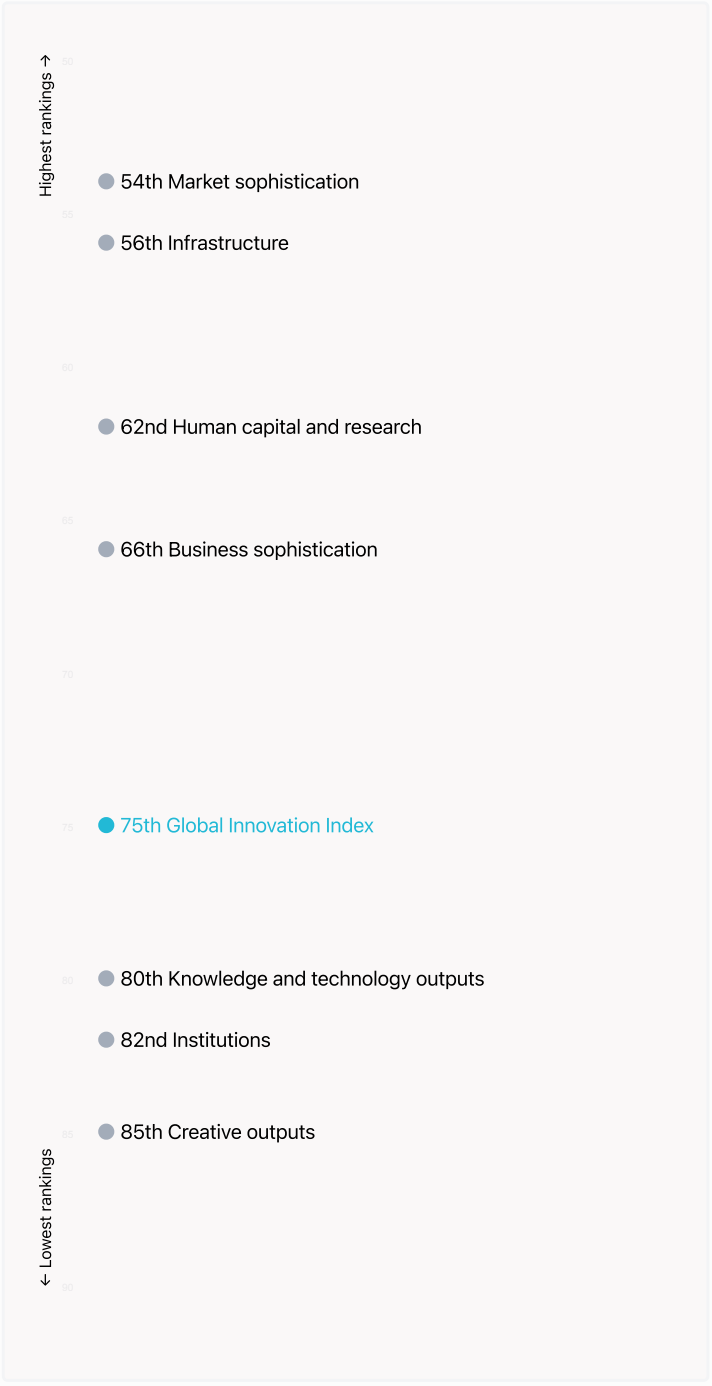


Global Innovation Index 2023



→ Overview of Montenegro's rankings in the seven areas of the GII in 2023

The chart shows the ranking for each of the seven areas that the GII comprises. The strongest areas for Montenegro are those that rank above the GII (shown in blue) and the weakest are those that rank below.



> Highest rankings

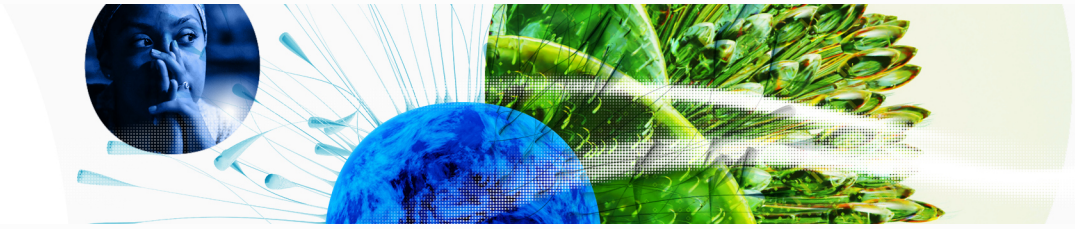
Montenegro ranks highest in Market sophistication (54th), Infrastructure (56th), Human capital and research (62nd) and Business sophistication (66th).

> Lowest rankings

Montenegro ranks lowest in Creative outputs (85th), Institutions (82nd) and Knowledge and technology outputs (80th).

The full WIPO Intellectual Property Statistics profile for Montenegro can be found on this link.

Global Innovation Index 2023



→ Benchmark of Montenegro against other country groupings for each of the seven areas of the GII Index

The charts shows the relative position of Montenegro (blue bar) against other country groupings (grey bars), for each of the seven areas of the GII Index.

> Upper-Middle-Income economies

Montenegro performs below the upper-middle-income group average in Knowledge and technology outputs, Creative outputs, Business sophistication, Institutions.

> Europe

Montenegro performs below the regional average in all the pillars.

Knowledge and technology outputs

- Top 10 | Score: 58.96
- Europe | Score: 38.80
- Upper middle income | Score: 22.36
- Montenegro | Score: 18.81

Creative outputs

- Top 10 | 56.09
- Europe | 39.87
- Upper middle income | 23.16
- Montenegro | 17.21

Business sophistication

- Top 10 | 64.39
- Europe | 44.61
- Upper middle income | 29.27
- Montenegro | 28.10

Market sophistication

- Top 10 | 61.93
- Europe | 43.65
- Montenegro | 37.78
- Upper middle income | 35.45

Human capital and research

- Top 10 | 60.28
- Europe | 44.05
- Montenegro | 32.36
- Upper middle income | 29.68

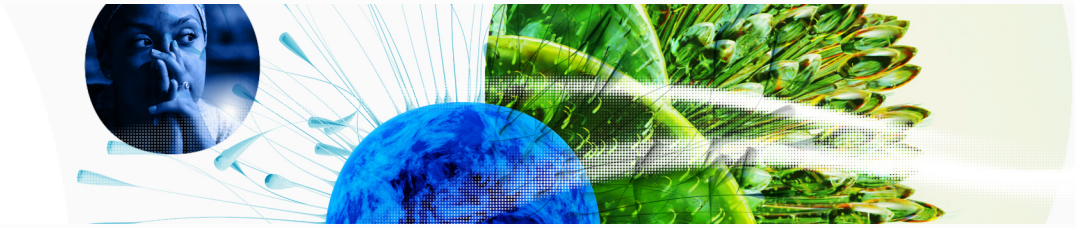
Infrastructure

- Top 10 | 62.83
- Europe | 54.69
- Montenegro | 44.23
- Upper middle income | 40.40

Institutions

- Top 10 | 79.85
- Europe | 61.69
- Upper middle income | 47.71
- Montenegro | 45.44

Global Innovation Index 2023



→ Innovation strengths and weaknesses in Montenegro

The table below gives an overview of the indicator strengths and weaknesses of Montenegro in the GII 2023.

> Montenegro's main innovation strengths are **Country-code TLDs/th pop. 15-69** (rank 1), **FDI net inflows, % GDP** (rank 10) and **ISO 14001 environment/bn PPP$ GDP** (rank 16).

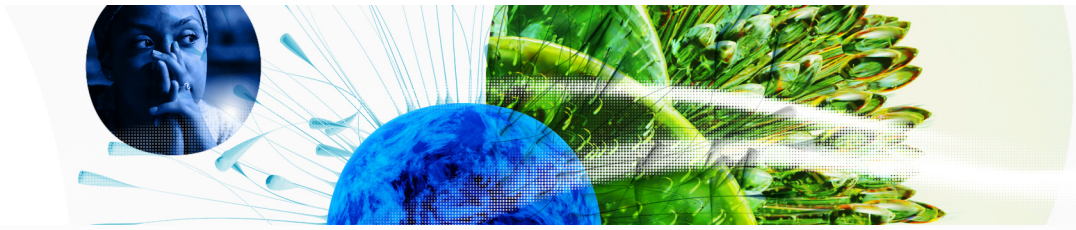
Strengths

Rank	Code	Indicator name
1	7.3.2	Country-code TLDs/th pop. 15-69
10	5.3.4	FDI net inflows, % GDP
16	3.3.3	ISO 14001 environment/bn PPP$ GDP
19	5.3.3	ICT services imports, % total trade
26	3.1.1	ICT access
26	6.3.5	ISO 9001 quality/bn PPP$ GDP
27	6.3.4	ICT services exports, % total trade
30	5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP
31	6.1.4	Scientific and technical articles/bn PPP$ GDP
36	1.2.3	Cost of redundancy dismissal

Weaknesses

Rank	Code	Indicator name
130	4.3.3	Domestic market scale, bn PPP$
122	6.1.5	Citable documents H-index
118	1.3.1	Policies for doing business
95	5.2.5	Patent families/bn PPP$ GDP
91	5.1.2	Firms offering formal training, %
79	7.1.1	Intangible asset intensity, top 15, %
74	7.1.3	Global brand value, top 5,000
71	2.3.4	QS university ranking, top 3
48	6.2.2	Unicorn valuation, % GDP
40	2.3.3	Global corporate R&D investors, top 3, mn US$

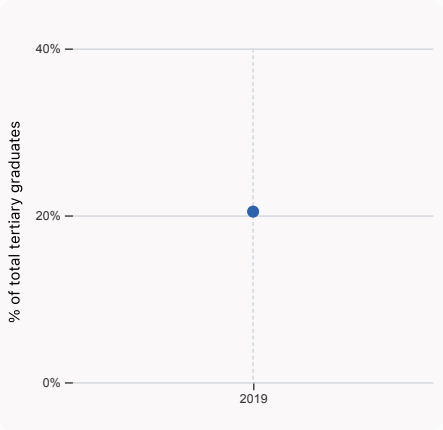
Global Innovation Index 2023



→ Montenegro's innovation system

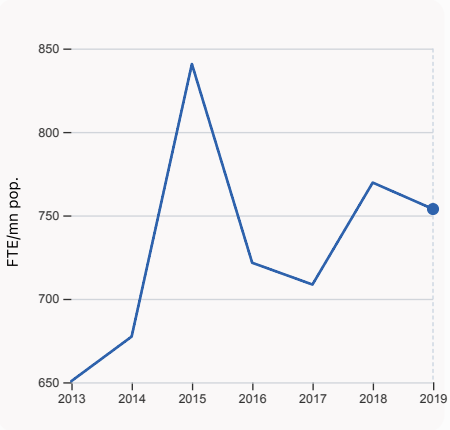
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Montenegro



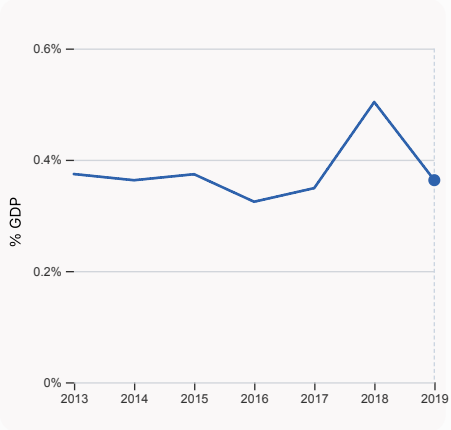
2.2.2 Graduates in science and engineering, %

was equal to 20.45 % of total tertiary graduates in 2019, equivalent to an indicator rank of 69.



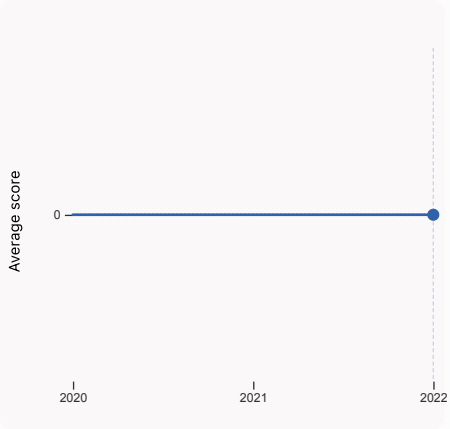
2.3.1 Researchers, FTE/mn pop.

was equal to 753.8 FTE/mn pop. in 2019, down by 2.059% from the year prior – and equivalent to an indicator rank of 60.



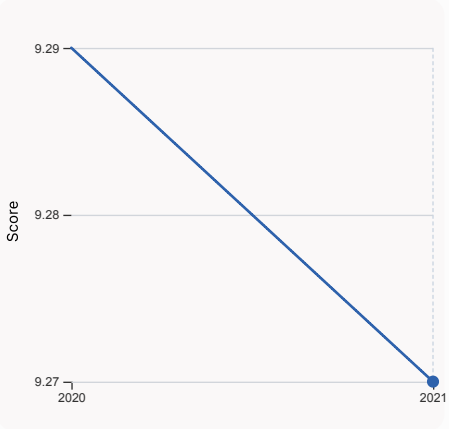
2.3.2 Gross expenditure on R&D, % GDP

was equal to 0.363% GDP in 2019, down by 0.14 percentage points from the year prior – and equivalent to an indicator rank of 70.



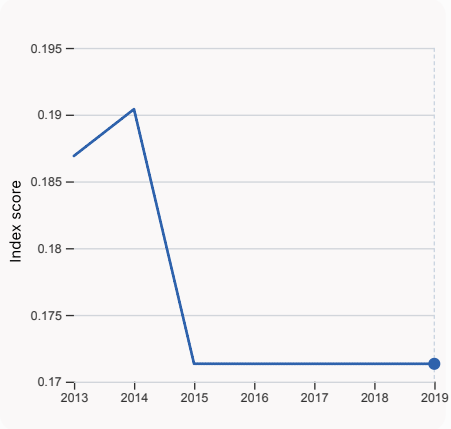
2.3.4 QS university ranking, top 3

was equal to an average score of 0 for the top 3 universities in 2022, equivalent to an indicator rank of 71.



3.1.1 ICT access

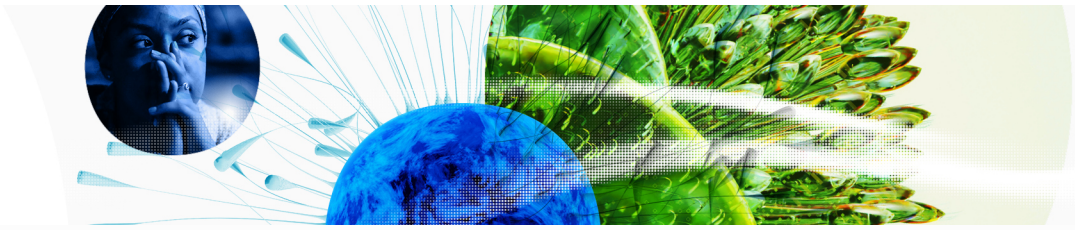
was equal to a score of 9.27 in 2021, down by 0.22% from the year prior – and equivalent to an indicator rank of 26.

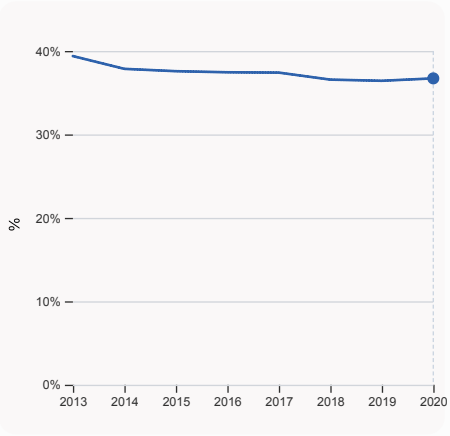


4.3.2 Domestic industry diversification

was equal to an index score of 0.171 in 2019, with no change from the year prior – and equivalent to an indicator rank of 60.

Global Innovation Index 2023

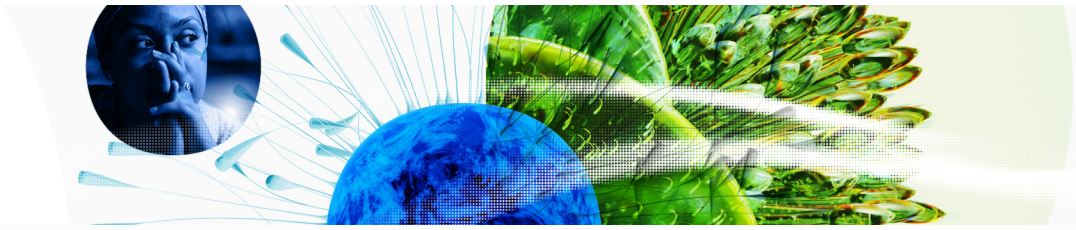




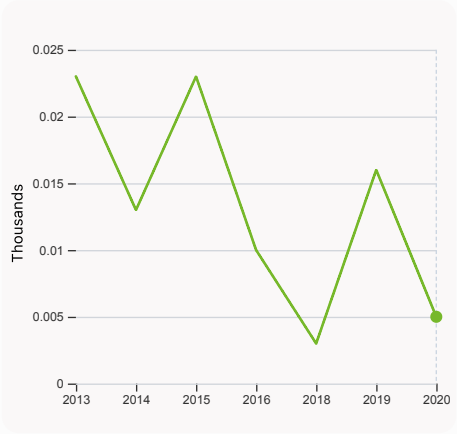
5.1.1 **Knowledge-intensive employment, %**

was equal to 36.72% in 2020, up by 0.29 percentage points from the year prior – and equivalent to an indicator rank of 38.

Global Innovation Index 2023

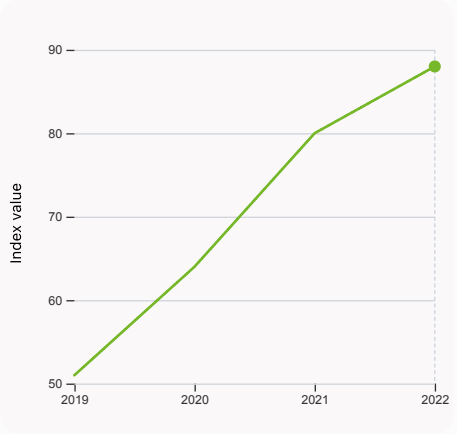


> Innovation outputs in Montenegro



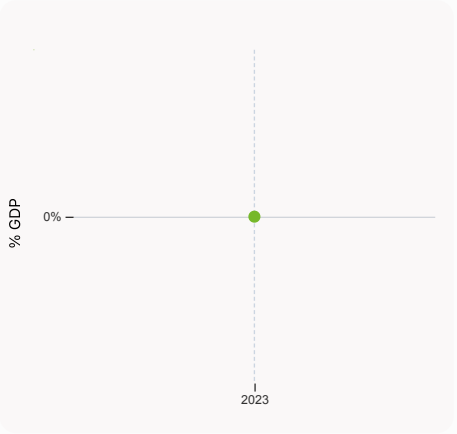
6.1.1 Patents by origin

was equal to 0.005 Thousands in 2020, down by 68.75% from the year prior – and equivalent to an indicator rank of 84.



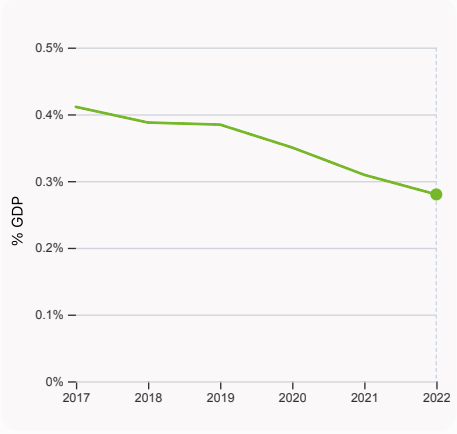
6.1.5 Citable documents H-index

was equal to an index value of 88 in 2022, up by 10% from the year prior – and equivalent to an indicator rank of 122.



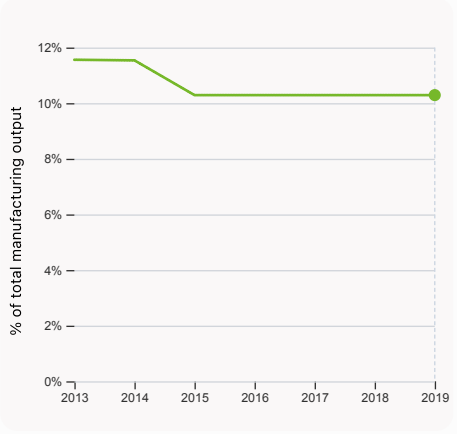
6.2.2 Unicorn valuation, % GDP

was equal to 0 % GDP in 2023 – and equivalent to an indicator rank of 48.



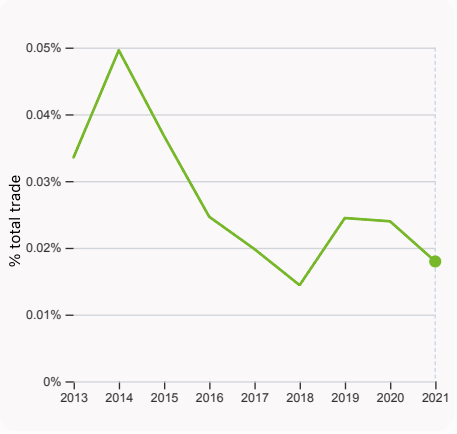
6.2.3 Software spending, % GDP

was equal to 0.28% GDP in 2022, down by 0.029 percentage points from the year prior – and equivalent to an indicator rank of 48.



6.2.4 High-tech manufacturing, %

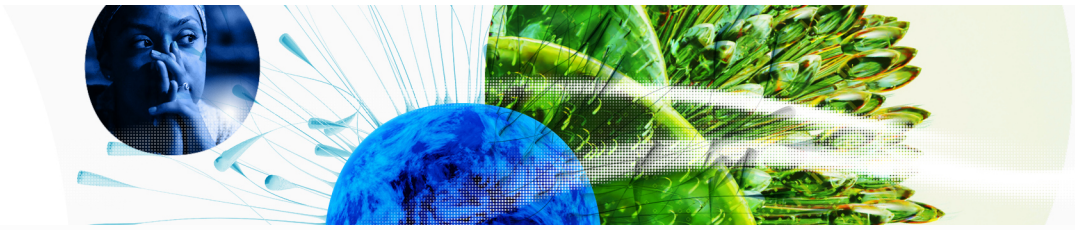
was equal to 10.29% of total manufacturing output in 2019, up by with no change from the year prior – and equivalent to an indicator rank of 90.

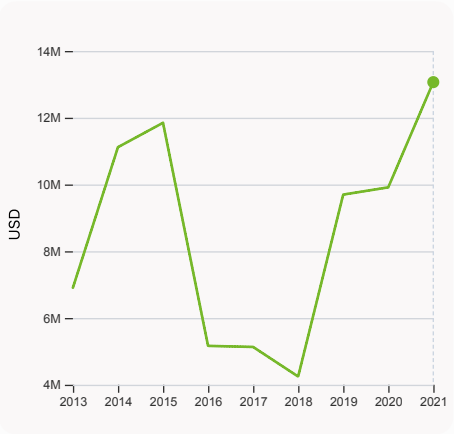


6.3.1 Intellectual property receipts, % total trade

was equal to 0.018% total trade in 2021, down by 0.006 percentage points from the year prior – and equivalent to an indicator rank of 84.

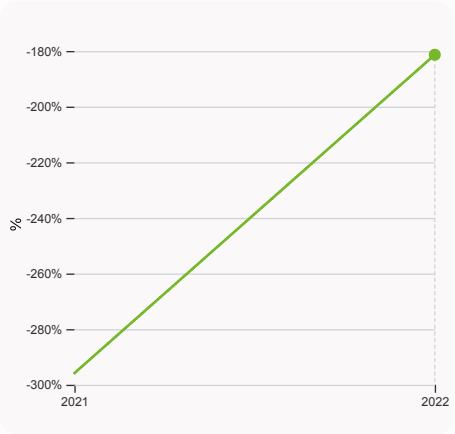
Global Innovation Index 2023





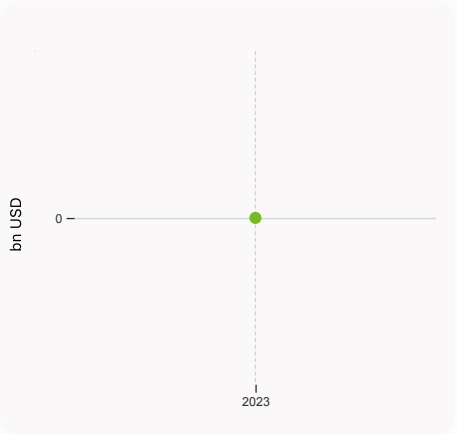
6.3.3 High-tech exports

was equal to 13,067,216 USD in 2021, up by 31.8% from the year prior – and equivalent to an indicator rank of 92.



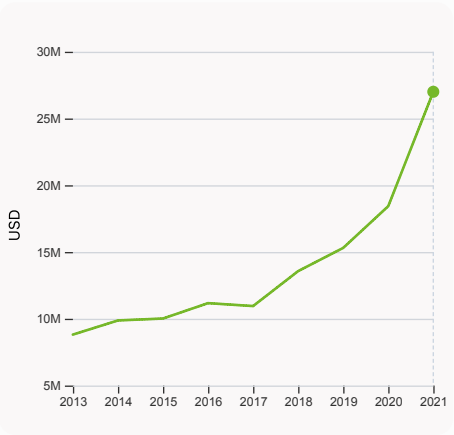
7.1.1 Intangible asset intensity, top 15, %

was equal to -181.359% in 2022, up by 114.47 percentage points from the year prior – and equivalent to an indicator rank of 79.



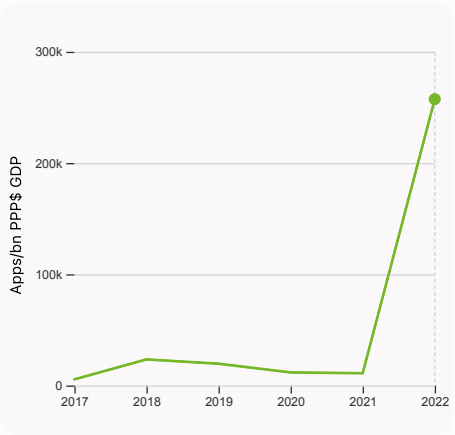
7.1.3 Global brand value, top 5,000

was equal to 0 bn USD in 2023 – and equivalent to an indicator rank of 74.



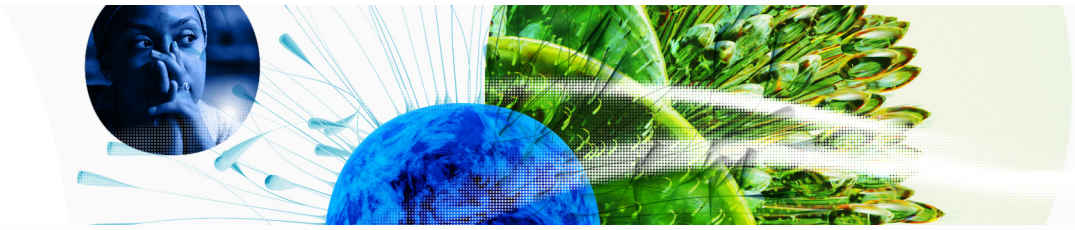
7.2.1 Cultural and creative services exports

was equal to 27,003,000 USD in 2021, up by 46.48% from the year prior – and equivalent to an indicator rank of 36.



7.3.4 Mobile app creation/bn PPP$ GDP

was equal to 257,429.7 Apps/bn PPP$ GDP in 2022, up by 2225.6% from the year prior – and equivalent to an indicator rank of 65.



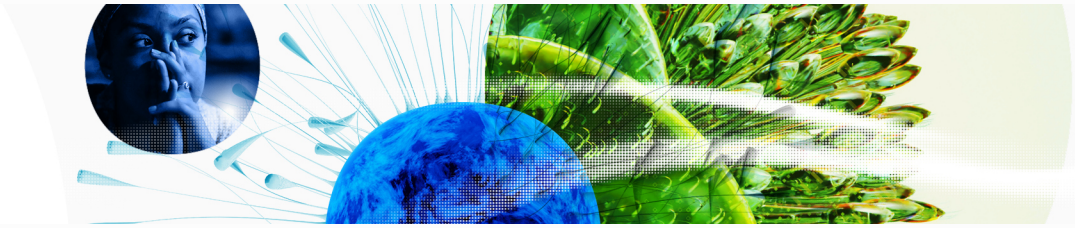
→ Montenegro's innovation top performers

> 7.1.1 Top 15 intangible-asset intensive companies in Montenegro

Rank	Firm	Intensity, %
1	ADDIKO BANK JSC PODGORICA	34.13
2	HTP VELIKA PLAZA AD ULCINJ	--
3	HIPOTEKARNA BANKA AD PODGORICA	--

Source: Brand Finance (https://brandirectory.com/reports/gift-2022).
Note: Brand Finance only provides within economy ranks.

Global Innovation Index 2023



Montenegro

GII 2023 rank **75**

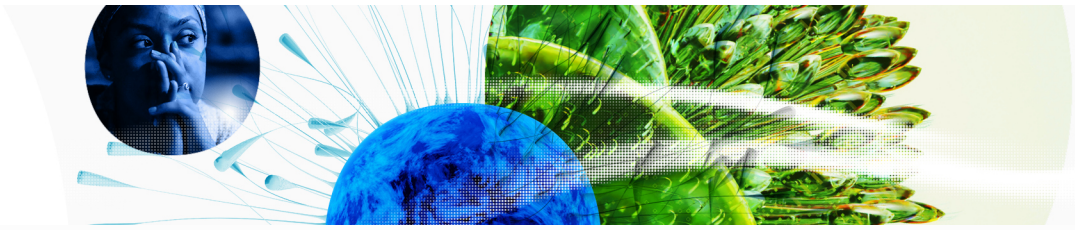
Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
83	62	Upper middle	EUR	0.6	16.2	26,032.4

	Score / Value	Rank	
Institutions	**45.4**	**82**	
1.1 Institutional environment	**44.8**	**67**	
1.1.1 Operational stability for businesses*	52.8	65	
1.1.2 Government effectiveness*	36.9	69	
1.2 Regulatory environment	**69.6**	**44**	
1.2.1 Regulatory quality*	53.3	51	
1.2.2 Rule of law*	38.0	64	
1.2.3 Cost of redundancy dismissal	11.2	36	●◆
1.3 Business environment	**21.8**	**[116]**	
1.3.1 Policies for doing business†	21.8	118	○◇
1.3.2 Entrepreneurship policies and culture†	n/a	n/a	
Human capital and research	**32.4**	**62**	
2.1 Education	**59.4**	**[39]**	
2.1.1 Expenditure on education, % GDP	n/a	n/a	
2.1.2 Government funding/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3 School life expectancy, years	15.2	46	
2.1.4 PISA scales in reading, maths and science	421.9	55	
2.1.5 Pupil-teacher ratio, secondary	12.9	60	
2.2 Tertiary education	**34.2**	**52**	
2.2.1 Tertiary enrolment, % gross	55.6	59	
2.2.2 Graduates in science and engineering, %	20.5	69	
2.2.3 Tertiary inbound mobility, %	n/a	n/a	
2.3 Research and development (R&D)	**3.5**	**84**	
2.3.1 Researchers, FTE/mn pop.	753.8	60	
2.3.2 Gross expenditure on R&D, % GDP	0.4	70	
2.3.3 Global corporate R&D investors, top 3, mn US$	0.0	40	○◇
2.3.4 QS university ranking, top 3*	0.0	71	○◇
Infrastructure	**44.2**	**56**	
3.1 Information and communication technologies (ICTs)	**67.0**	**73**	
3.1.1 ICT access*	89.2	26	●◆
3.1.2 ICT use*	82.9	51	
3.1.3 Government's online service*	50.6	90	
3.1.4 E-participation*	45.3	81	
3.2 General infrastructure	**27.1**	**63**	
3.2.1 Electricity output, GWh/mn pop.	5,442.8	43	◆
3.2.2 Logistics performance*	31.8	71	
3.2.3 Gross capital formation, % GDP	25.3	51	
3.3 Ecological sustainability	**38.5**	**35**	●◆
3.3.1 GDP/unit of energy use	9.9	68	
3.3.2 Environmental performance*	47.5	49	
3.3.3 ISO 14001 environment/bn PPP$ GDP	5.8	16	●◆
Market sophistication	**37.8**	**54**	
4.1 Credit	**18.6**	**96**	
4.1.1 Finance for startups and scaleups†	n/a	n/a	
4.1.2 Domestic credit to private sector, % GDP	60.0	60	
4.1.3 Loans from microfinance institutions, % GDP	1.3	21	
4.2 Investment	**n/a**	**[n/a]**	
4.2.1 Market capitalization, % GDP	n/a	n/a	
4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP	n/a	n/a	
4.2.3 VC recipients, deals/bn PPP$ GDP	n/a	n/a	
4.2.4 VC received, value, % GDP	n/a	n/a	
4.3 Trade, diversification, and market scale	**56.9**	**73**	
4.3.1 Applied tariff rate, weighted avg., %	2.6	67	
4.3.2 Domestic industry diversification	87.3	60	
4.3.3 Domestic market scale, bn PPP$	16.2	130	○

	Score / Value	Rank	
Business sophistication	**28.1**	**66**	
5.1 Knowledge workers	**35.4**	**60**	
5.1.1 Knowledge-intensive employment, %	36.7	38	◆
5.1.2 Firms offering formal training, %	15.8	91	○◇
5.1.3 GERD performed by business, % GDP	0.2	55	
5.1.4 GERD financed by business, %	37.8	49	
5.1.5 Females employed w/advanced degrees, %	18.2	38	
5.2 Innovation linkages	**15.4**	**96**	
5.2.1 University-industry R&D collaboration†	36.5	81	
5.2.2 State of cluster development†	19.7	113	◇
5.2.3 GERD financed by abroad, % GDP	0.0	53	
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	30	●◆
5.2.5 Patent families/bn PPP$ GDP	0.0	95	○◇
5.3 Knowledge absorption	**33.5**	**64**	
5.3.1 Intellectual property payments, % total trade	0.2	92	◇
5.3.2 High-tech imports, % total trade	6.5	96	
5.3.3 ICT services imports, % total trade	2.9	19	●◆
5.3.4 FDI net inflows, % GDP	10.2	10	●◆
5.3.5 Research talent, % in businesses	12.6	58	
Knowledge and technology outputs	**18.8**	**80**	
6.1 Knowledge creation	**15.4**	**64**	
6.1.1 Patents by origin/bn PPP$ GDP	0.4	84	
6.1.2 PCT patents by origin/bn PPP$ GDP	0.2	38	
6.1.3 Utility models by origin/bn PPP$ GDP	n/a	n/a	
6.1.4 Scientific and technical articles/bn PPP$ GDP	n/a	n/a	
6.1.5 Citable documents H-index	2.5	122	○
6.2 Knowledge impact	**23.7**	**85**	
6.2.1 Labor productivity growth, %	1.4	48	
6.2.2 Unicorn valuation, % GDP	0.0	48	○◇
6.2.3 Software spending, % GDP	0.3	48	
6.2.4 High-tech manufacturing, %	10.3	90	
6.3 Knowledge diffusion	**17.4**	**87**	
6.3.1 Intellectual property receipts, % total trade	0.0	84	
6.3.2 Production and export complexity	n/a	n/a	
6.3.3 High-tech exports, % total trade	0.4	92	
6.3.4 ICT services exports, % total trade	4.0	27	●◆
6.3.5 ISO 9001 quality/bn PPP$ GDP	10.9	26	●◆
Creative outputs	**17.2**	**85**	
7.1 Intangible assets	**5.3**	**118**	◇
7.1.1 Intangible asset intensity, top 15, %	-181.4	79	○◇
7.1.2 Trademarks by origin/bn PPP$ GDP	29.6	79	
7.1.3 Global brand value, top 5,000	0.0	74	○◇
7.1.4 Industrial designs by origin/bn PPP$ GDP	0.1	114	
7.2 Creative goods and services	**9.8**	**[67]**	
7.2.1 Cultural and creative services exports, % total trade	0.9	36	
7.2.2 National feature films/mn pop. 15-69	n/a	n/a	
7.2.3 Entertainment and media market/th pop. 15-69	n/a	n/a	
7.2.4 Creative goods exports, % total trade	0.1	93	
7.3 Online creativity	**48.5**	**27**	●◆
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	1.7	92	
7.3.2 Country-code TLDs/th pop. 15-69	100.0	1	●◆
7.3.3 GitHub commits/mn pop. 15-69	27.1	37	◆
7.3.4 Mobile app creation/bn PPP$ GDP	65.0	65	

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; † a survey question, 🕓 indicates that the economy's data are older than the base year; see appendices for details, including the year of the data, at https://www.wipo.int/gii-ranking. Square brackets [ ] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.

Global Innovation Index 2023



→ Data availability

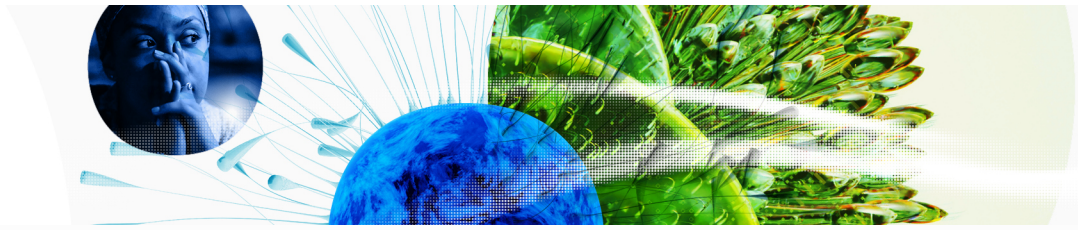
The following tables list indicators that are either missing or outdated for Montenegro.

> Montenegro has missing data for thirteen indicators and outdated data for sixteen indicators.

> Missing data for Montenegro

Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture	n/a	2022	Global Entrepreneurship Monitor
2.1.1	Expenditure on education, % GDP	n/a	2021	UNESCO Institute for Statistics
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2019	UNESCO Institute for Statistics
2.2.3	Tertiary inbound mobility, %	n/a	2020	UNESCO Institute for Statistics
4.1.1	Finance for startups and scaleups	n/a	2022	Global Entrepreneurship Monitor
4.2.1	Market capitalization, % GDP	n/a	2020	World Federation of Exchanges; World Bank
4.2.2	Venture capital (VC) investors, deals/bn PPP$ GDP	n/a	2022	Refinitiv; International Monetary Fund
4.2.3	VC recipients, deals/bn PPP$ GDP	n/a	2022	Refinitiv; International Monetary Fund
4.2.4	VC received, value, % GDP	n/a	2022	Refinitiv; International Monetary Fund
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	2021	World Intellectual Property Organization; International Monetary Fund
6.3.2	Production and export complexity	n/a	2020	Harvard University, Growth Lab
7.2.2	National feature films/mn pop. 15-69	n/a	2021	OMDIA; United Nations, World Population Prospects
7.2.3	Entertainment and media market/th pop. 15-69	n/a	2022	PwC, GEMO; United Nations, World Population Prospects; International Monetary Fund

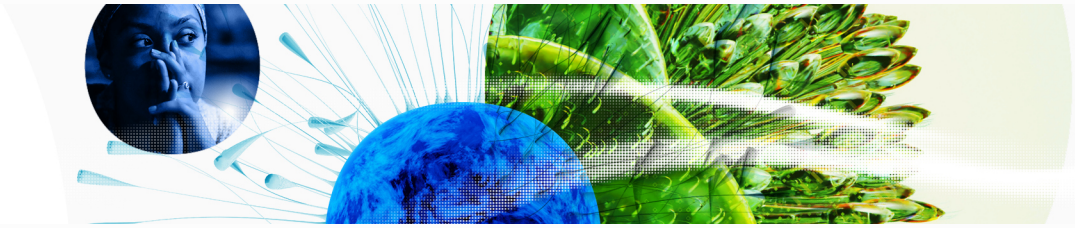
Global Innovation Index 2023



> Outdated data for Montenegro

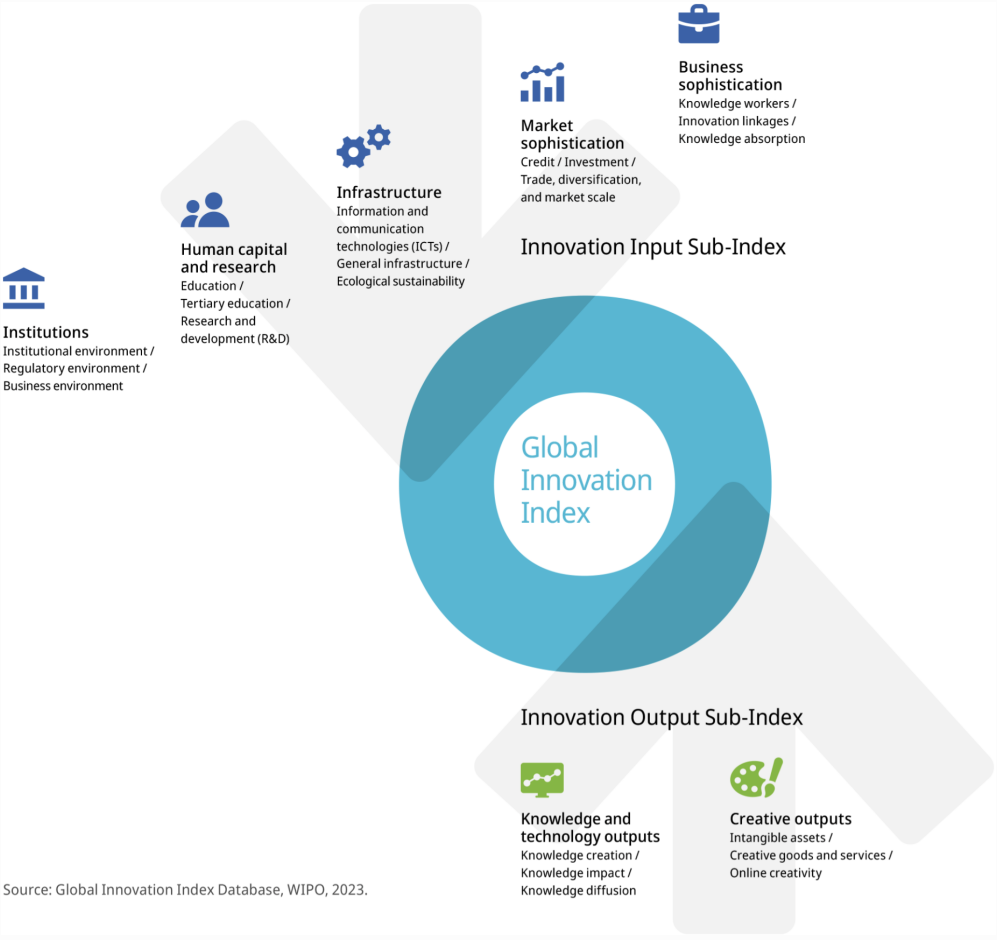
Code	Indicator name	Economy Year	Model Year	Source
2.2.2	Graduates in science and engineering, %	2019	2020	UNESCO Institute for Statistics; Eurostat; OECD
2.3.1	Researchers, FTE/mn pop.	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
3.2.1	Electricity output, GWh/mn pop.	2020	2021	International Energy Agency
4.3.2	Domestic industry diversification	2019	2020	United Nations Industrial Development Organization
5.1.1	Knowledge-intensive employment, %	2020	2022	International Labour Organization
5.1.3	GERD performed by business, % GDP	2018	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.4	GERD financed by business, %	2018	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.5	Females employed w/advanced degrees, %	2020	2022	International Labour Organization
5.2.3	GERD financed by abroad, % GDP	2018	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	2020	2022	Refinitiv; International Monetary Fund
5.3.5	Research talent, % in businesses	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.1.1	Patents by origin/bn PPP$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund
6.2.4	High-tech manufacturing, %	2019	2020	United Nations Industrial Development Organization
7.1.2	Trademarks by origin/bn PPP$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund
7.1.4	Industrial designs by origin/bn PPP$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund

Global Innovation Index 2023



About the Global Innovation Index

- The Global Innovation Index (GII) is published by the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations.
- Recognizing that innovation is a key driver of economic development, the GII aims to provide an innovation ranking and rich analysis referencing around 130 economies. Over the last decade, the GII has established itself as both a leading reference on innovation and a "tool for action" for economies that incorporate the GII into their innovation agendas.



Source: Global Innovation Index Database, WIPO, 2023.

The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that include institutions, human capital and research, infrastructure, credit, investment, linkages; the creation, absorption and diffusion of knowledge; and creative outputs.

The GII has two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index, and seven pillars, each consisting of three sub-pillars.