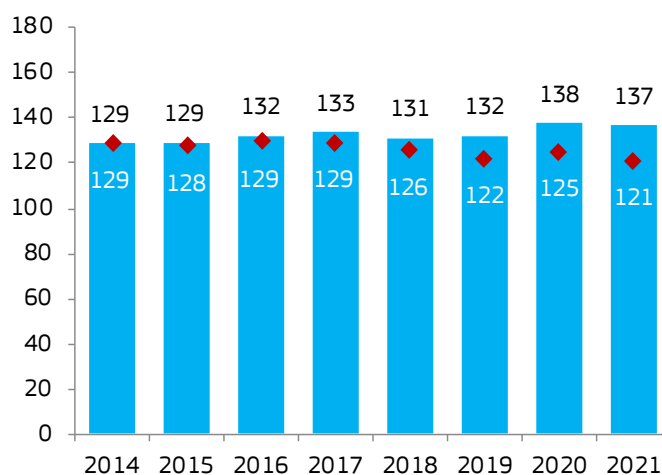




Luxembourg is a Strong Innovator.

Over time, performance relative to the EU has decreased.



■ Relative to EU in base year ◆ Relative to EU in same year

Structural differences with the EU are shown in the table below including, compared to the EIS 2020, new information on different types of (innovating) enterprises (Innovation profiles) and environmental indicators.

	LU	EU
Performance and structure of the economy		
GDP per capita (PPS)	80,600	30,800
Average annual GDP growth (%)	-1.3	-2.5
Employment share Manufacturing (NACE C) (%)	4.2	16.5
of which High and Medium high-tech (%)	18.5	37.9
Employment share Services (NACE G-N) (%)	47.5	41.2
of which Knowledge-intensive services (%)	60.5	35.1
Turnover share SMEs (%)	47.1	36.5
Turnover share large enterprises (%)	39.6	45.7
Foreign-controlled enterprises – share of value added (%)	19.3	11.8
Business and entrepreneurship		
Enterprise births (10+ employees) (%)	0.9	1.0
Total Entrepreneurial Activity (TEA) (%)	10.0	6.7
FDI net inflows (% GDP)	-15.0	2.0
Top R&D spending enterprises per 10 million population	255.2	16.2
Buyer sophistication (1 to 7 best)	5.0	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)	69.6	76.5
Basic school entrepreneurial education and training	2.5	2.0
Govt. procurement of advanced tech. products	4.7	3.5
Rule of law (-2.5 to 2.5 best)	1.8	1.1
Climate change indicators		
Circular material use rate	11.1	11.7
Greenhouse gas emissions intensity of energy consumption	92.1	86.6
Eco-Innovation Index	165.0	100.0
Demography		
Population size	0.6	446.7
Average annual population growth (%)	2.0	0.1
Population density	235.2	108.8

Luxembourg's strengths are in *Attractive research systems*, *Human resources* and *Intellectual assets*. The top-3 indicators include Foreign doctorate students, Trademark applications, and International scientific co-publications.

The increase in innovation performance between 2019 and 2020 was due to a strong increase in Doctorate graduates and Job-to-job mobility of HRST. The decrease in 2021 is mainly caused by a strong decline in Employment in innovative enterprises.

Luxembourg is showing above average scores on the Climate change related indicators.

Luxembourg	Relative to EU 2021 in 2021	Relative to EU 2014 in 2014	Relative to EU 2021 in 2021
SUMMARY INNOVATION INDEX	121.3	128.8	136.5
Human resources	170.6	132.8	180.8
Doctorate graduates	126.0	42.6	111.5
Population with tertiary education	207.1	219.0	266.9
Lifelong learning	183.8	190.0	202.2
Attractive research systems	184.5	185.2	207.7
International scientific co-publications	173.0	185.6	226.8
Most cited publications	128.9	104.9	126.7
Foreign doctorate students	297.3	353.1	353.1
Digitalisation	122.0	130.3	168.8
Broadband penetration	121.6	114.0	184.4
People with above basic overall digital skills	122.7	150.0	150.0
Finance and support	94.2	110.1	112.2
R&D expenditures in the public sector	74.5	66.7	71.9
Venture capital expenditures	180.8	304.1	304.1
Government support for business R&D	28.3	33.3	32.7
Firm investments	45.1	39.8	54.5
R&D expenditure in the business sector	39.0	51.2	43.3
Non-R&D Innovation expenditures	29.7	9.8	33.7
Innovation expenditures per employee	65.0	52.4	85.8
Use of information technologies	145.3	147.0	167.9
Enterprises providing ICT training	106.7	113.3	106.7
Employed ICT specialists	178.6	185.7	238.1
Innovators	98.6	163.8	134.9
Product innovators (SMEs)	100.0	140.7	141.1
Business process innovators (SMEs)	97.2	184.2	129.3
Linkages	145.2	153.8	195.8
Innovative SMEs collaborating with others	105.6	101.9	154.8
Public-private co-publications	198.1	172.4	222.1
Job-to-job mobility of HRST	142.9	176.9	205.1
Intellectual assets	145.8	154.1	126.4
PCT patent applications	55.9	49.9	48.5
Trademark applications	192.6	202.2	202.2
Design applications	175.8	198.9	120.5
Employment impacts	144.5	172.2	147.2
Employment in knowledge-intensive activities	229.3	229.3	250.7
Employment in innovative enterprises	76.5	131.8	73.8
Sales impacts	95.6	99.5	97.4
Medium and high tech goods exports	77.8	88.6	85.3
Knowledge-intensive services exports	148.7	148.4	157.4
Sales of innovative products	48.4	55.6	42.1
Environmental sustainability	116.9	121.6	121.8
Resource productivity	184.6	248.6	273.4
Air emissions by fine particulate matter	90.1	71.0	95.8
Environment-related technologies	86.5	111.0	65.0

The colours show normalised performance in 2021 relative to that of the EU in 2021: dark green: above 125%; 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.