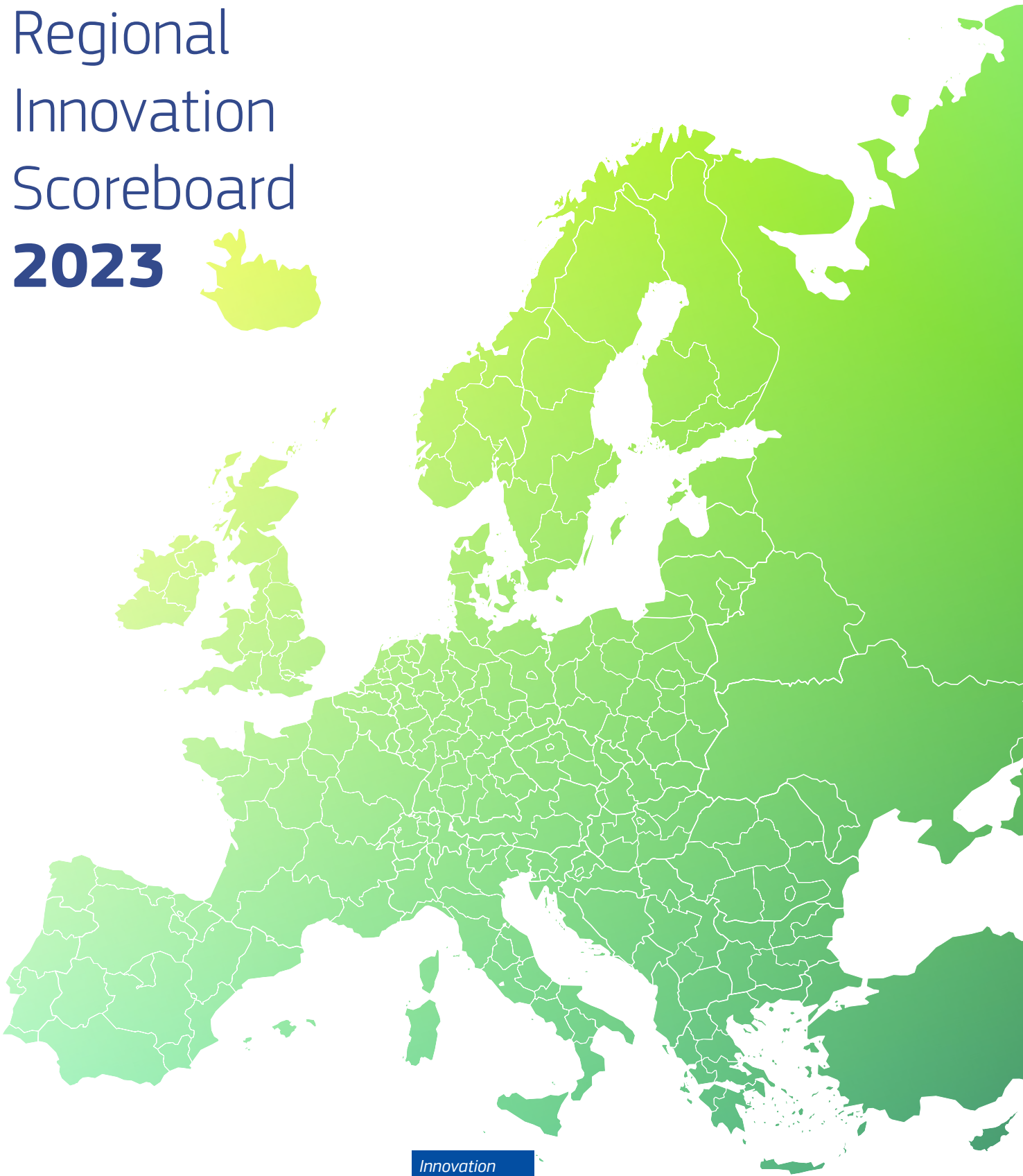
European Commission

Regional Innovation Scoreboard **2023**



Innovation

Regional Innovation Scoreboard 2023

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Regional Innovation Scoreboard 2023

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

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

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Executive summary

This 11th edition of the Regional Innovation Scoreboard (RIS) offers a comparative assessment of the research and innovation performance of 239 regions in 22 EU Member States, Norway, Serbia, Switzerland, and the United Kingdom. In addition, Cyprus, Estonia, Latvia, Luxembourg and Malta are included at the country level, as in these countries NUTS 1 and NUTS 2 level regions are identical to the country territory.

The RIS accompanies the European Innovation Scoreboard (EIS), which assesses the performance of *national* innovation systems. It provides a regional innovation benchmark - the Regional Innovation Index (RII). This is a composite indicator, which builds on the same methodological framework as the EIS, although it summarises the performance on fewer indicators due to lower data availability at regional level (21 indicators compared to 32 in the EIS).

Regional performance groups

Like in the EIS, Europe's regions have been classified into four performance groups: regional Innovation Leaders (36 regions), regional Strong Innovators (70 regions), regional Moderate Innovators (69 regions), and regional Emerging Innovators (64 regions).

A more detailed breakdown of these performance groups is obtained by splitting each group into three sub-groups, the best performing sub-group is assigned with a '+', and the worst performing subgroup with a '-'. The most innovative regions will be 'Innovation Leaders +', and the least innovative regions will be 'Emerging Innovators -'. This more detailed breakdown helps to capture better the diversity in the performance of regional innovation systems. For example, 11 countries have regions in four or more different performance subgroups.

The most innovative regions are typically in the most innovative countries

The results confirm that innovative capacity is highly concentrated and document the regional dimension of the innovation divide in Europe. Most Regional Innovation Leaders belong to countries identified as Innovation Leaders or as Strong Innovators in the 2023 EIS. However, regional ‚pockets of excellence' can be identified in several Moderate Innovator countries such as the region of *Praha* (CZ01) in Czechia, *País Vasco* (ES21) in Spain, *Emilia-Romagna* (ITH5) in Italy, and *Budapest* (HU11) in Hungary), and Emerging Innovators (*Grad Zagreb* (HR01) in Croatia, *Warszawski stoleczny* (PL91) in Poland, *Bratislavský kraj* (SK01) in Slovakia, and *Belgrade* (RS11) in Serbia).

At the same time, most Regional Moderate and Emerging Innovators belong to countries identified as Moderate and Emerging Innovators in the 2023 EIS. However, to a more limited extent, there are also regional Moderate Innovators and regional Emerging Innovators in Innovation Leader countries (3 in total) and Strong Innovator countries (20).

Rank results revealed: Hovedstaden most innovative region in the EU

The most innovative region in Europe is *Hovedstaden* (DK01) in Denmark, followed by *Helsinki-Uusimaa* (FI1B) in Finland, *Oberbayern* (DE21) in Germany, *Stockholm* (SE11) in Sweden, and *Berlin* (DE3) in Germany.

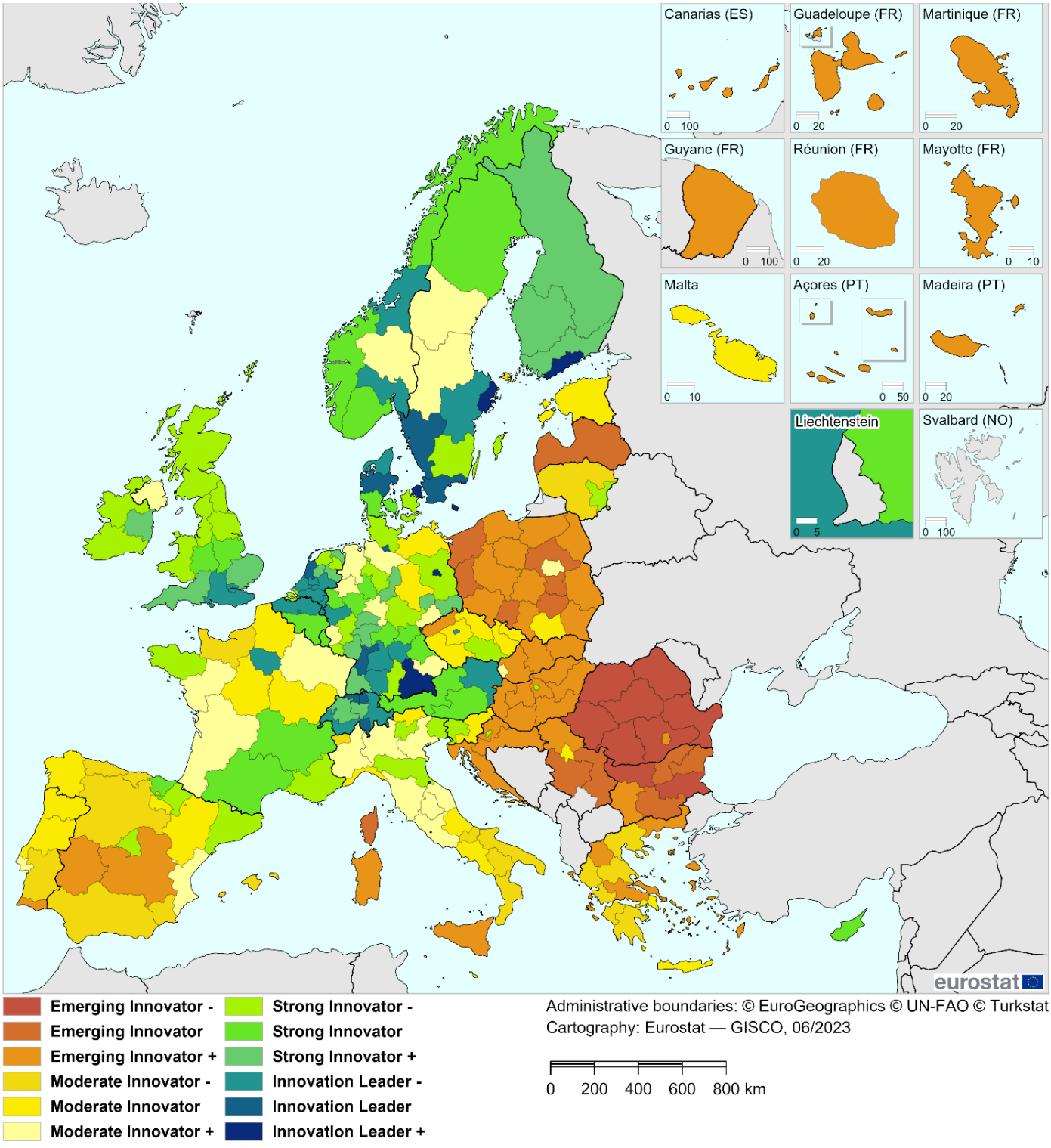
For most regions, innovation performance has improved over time

For 211 regions, performance has increased over time between 2016 and 2023. In more than half of the countries, performance has increased for all their regions lifting their innovative capacity as a whole (Austria, Belgium, Croatia, Czechia, Denmark, Greece, Italy, Hungary, Lithuania, Netherlands, Norway, Poland, Portugal, Serbia, Slovakia, Slovenia, and Spain). Performance relative to the EU average has increased over time in 126 regions, including all regions in Belgium, Czechia, Greece, and Lithuania.

Performance relative to the EU average has decreased over time in 113 regions, including all regions in Bulgaria, France, Ireland, Romania, and Slovenia. For 28 regions, from nine countries, performance has decreased over time, with most regions located in France (12), Switzerland (4) and Germany (4).

Changes in RIS 2023 methodology

The RIS 2023 follows the methodology of the EIS 2023 and uses data for 239 regions across Europe for 21 of the 32 indicators used in the EIS 2023. Compared to the RIS 2021, regional coverage has changed for Norway as the NUTS 2021 classification has been used instead of the NUTS 2016 classification in the RIS 2021. With data available for only 6 of 7 Norwegian NUTS 2021 regions, regional coverage has slightly declined from 240 regions in the RIS 2021 to 239 regions this year.



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

For Cyprus, Estonia, Latvia, Luxembourg and Malta, performance group membership is identical to that in the EIS 2023 report. For these countries, the corresponding colour codes for the middle sub-group of regions have been used.

1. Introduction

The 2023 Regional Innovation Scoreboard (RIS) is the regional extension of the 2023 European Innovation Scoreboard (EIS). The EIS provides a comparative assessment of the performance of innovation systems at the country level of the EU Member States, other European countries and regional neighbours. Innovation performance is measured using a composite indicator – the Summary Innovation Index – which summarises the performance based on 32 indicators. These indicators are grouped into four main types of activities – Framework conditions, Investments, Innovation activities, and Impacts – and 12 innovation dimensions. The EIS measurement framework is presented in **Table 1**.

Regions are important engines of economic development and measuring innovation performance at the regional level has become ever more important. Regional Systems of Innovation have become the focus of many academic studies and policy reports.[1] Economic literature has identified three stylized facts: 1) innovation is not uniformly distributed across regions, 2) innovation tends to be spatially concentrated over time, and 3) even regions with similar innovation capacity have different economic growth patterns. However, attempts to monitor Regional Systems of Innovation and regions' innovation performance are severely hampered by a lack of regional innovation data resulting in a lack of studies and tool to measure regional innovation.

The RIS addresses this gap by providing statistical facts on regions' innovation performance using regional data from both public data and confidential data sources and an online tool allowing users to visualize differences between regions on innovation performance and individual indicators. Regional innovation performance is measured using a composite indicator – the Regional Innovation Index (RII) – which summarizes the performance on 21 indicators.

Table 1: Measurement framework of the 2023 European Innovation Scoreboard

FRAMEWORK CONDITIONS

- Human resources
  - 1.1.1 New doctorate graduates
  - 1.1.2 Population aged 25-34 with tertiary education
  - 1.1.3 Lifelong learning
- Attractive research systems
  - 1.2.1 International scientific co-publications
  - 1.2.2 Top-10% most cited publications
  - 1.2.3 Foreign doctorate students
- Digitalisation
  - 1.3.1 Broadband penetration
  - 1.3.2 Individuals who have above basic overall digital skills

INVESTMENTS

- Finance and support
  - 2.1.1 R&D expenditure in the public sector
  - 2.1.2 Venture capital expenditures
  - 2.1.3 Direct government funding and government tax support for business R&D
- Firm investments
  - 2.2.1 R&D expenditure in the business sector
  - 2.2.2 Non-R&D innovation expenditures
  - 2.2.3 Innovation expenditures per person employed
- Use of information technologies
  - 2.3.1 Enterprises providing training to develop or upgrade ICT skills of their personnel
  - 2.3.2 Employed ICT specialists

INNOVATION ACTIVITIES

- Innovators
  - 3.1.1 SMEs with product innovations
  - 3.1.2 SMEs with business process innovations
- Linkages
  - 3.2.1 Innovative SMEs collaborating with others
  - 3.2.2 Public-private co-publications
  - 3.2.3 Job-to-job mobility of Human Resources in Science & Technology
- Intellectual assets
  - 3.3.1 PCT patent applications
  - 3.3.2 Trademark applications
  - 3.3.3 Design applications

IMPACTS

- Employment impacts
  - 4.1.1 Employment in knowledge-intensive activities
  - 4.1.2 Employment in innovative enterprises
- Sales impacts
  - 4.2.1 Medium and high-tech product exports
  - 4.2.2 Knowledge-intensive services exports
  - 4.2.3 Sales of new-to-market and new-to-enterprise innovations
- Environmental sustainability
  - 4.3.1 Resource productivity
  - 4.3.2 Air emissions in fine particulates (PM2.5) in Industry
  - 4.3.3 Development of environment-related technologies

[1] Annex 6 in the RIS 2014 report provides a more detailed discussion of regional systems of innovation: https://publications.europa.eu/en/publication-detail/-/publication/69a64699-18d7-40b9-8f92-1db3226cd2ec

1.1 Regional coverage

The Regional Innovation Scoreboard covers 239 regions in 22 EU Member States, Norway, Serbia, Switzerland, and the United Kingdom at different NUTS levels. The NUTS classification (Nomenclature of territorial units for statistics) is a hierarchical system for dividing the economic territory of the EU, which distinguishes between three levels: NUTS 1 captures major socio-economic regions, NUTS 2 captures basic regions for the application of regional policies, and NUTS 3 captures small regions for specific diagnoses. For this edition of the RIS, the NUTS 2021 classification is used for all countries.

Depending on differences in regional data availability, the RIS covers 47 NUTS 1 regions and 192 NUTS 2 regions (**Annex 1**). In addition, the EU Member States Cyprus, Estonia, Latvia, Luxembourg, and Malta are included at the country level, as in these countries NUTS 1 and NUTS 2 levels are identical to the country territory. For the countries included at the country level, their scores relative to the EU27 from the EIS 2023 have been used.

With some countries only being covered at the NUTS 1 level, there can be significant differences in the average size of regions. For instance, the average population of a NUTS 1 region in France (total population of almost 68 million) is almost 4.5 million, whereas it is 2.8 million for an average NUTS 2 region in Italy (total population about 59 million). The average unit of regional innovation performance analysis is 1.6 times larger in France than in Italy. These differences in unit size have implications for the variation of performance scores within countries. In general, a higher number of regions will lead to larger differences between regions in the same country.

1.2 Indicators included in the RIS

In the RIS, regional innovation performance is measured using the measurement framework of the European Innovation Scoreboard (EIS) and using regional data for the same indicators applied to measure innovation performance at the country level. However, for many indicators used in the EIS, regional data are not available.

The RIS is limited to using regional data for 21 of the 32 EIS indicators (**Table 2**). For several indicators, slightly different definitions have been applied, as regional data would not be available if the definitions were the same as in the EIS:

- Regional data are not available for *Individuals who have above basic overall digital skills*. The indicator correlates highly at the country level with Households with broadband access, and regional data for the latter are available from Eurostat and used to calculate regional estimates for this indicator as follows:

  Regional score for Individuals who have above basic overall digital skills = Regional score for Households with broadband access / Country score for Households with broadband access * Country score for Individuals who have above basic overall digital skills

- For the indicators using expenditure data from the Community Innovation Survey (CIS) – Non-R&D innovation expenditures, Innovation expenditures per person employed in innovation-active enterprises, and Sales of new-to-market and new-to-enterprise innovations – the data refer only to SMEs and not to all enterprises.[2]

- Regional data are not available for *Employed ICT specialists*. The indicator correlates highly at the country level with Employment in information and communication (NACE J), and regional data for the latter are available from Eurostat and used to calculate regional estimates for this indicator as follows:

  Regional score for Employed ICT specialists = Regional score for Employment in information and communication(NACE J) / Country score for Employment in information and communication (NACE J) * Country score for employed ICT specialists

- For *PCT patent applications,* regional data have been extracted from the OECD's REGPAT database.

- For *Employment in knowledge-intensive activities*, regional data are also not available, and instead Employment in medium-high and high-tech manufacturing and knowledge-intensive services is used, which are available from Eurostat.

- For *Air emissions in fine particulates (PM2.5)* in Industry, alternative data are used for Exposure to fine particulates (PM2.5), which have been extracted from the European Environmental Agency (EEA).

In this report the indicator names of the EIS will be used also for the indicators for which either alternative indicators will be used or where regional data have been estimated. All indicators are explained in detail in **Annex 2**.

[2] Regional Community Innovation Survey (CIS) data are not publicly available and have been made available explicitly for the Regional Innovation Scoreboard by national statistical offices. The CIS assigns the innovation activities of multi-establishment enterprises to the region where the head office is located. There is a risk that regions without head offices score lower on the CIS indicators, as some of the activities in these regions are assigned to other regions with head offices. To minimize this risk, the regional CIS data excludes large firms - which are more likely to have multiple establishments in different regions - and focuses on SMEs only. More details are provided in the RIS 2023 Methodology Report.

Table 2: A comparison of the indicators included in the European Innovation Scoreboard and the Regional Innovation Scoreboard

	EIS 2023	RIS 2023
FRAMEWORK CONDITIONS		
HUMAN RESOURCES	*Doctorate graduates per 1000 population aged 25-34*	*No regional data*
	Percentage of population aged 25-34 having completed tertiary education	Identical
	Lifelong learning, the share of population aged 25-64 enrolled in education or training aimed at improving knowledge, skills and competences	Identical
ATTRACTIVE RESEARCH SYSTEMS	International scientific co-publications per million population	Identical
	Scientific publications among the top-10% most cited publications worldwide as percentage of total scientific publications of the country	Identical
	Foreign doctorate students as percentage of all doctorate students	*No regional data*
DIGITALISATION	*Broadband penetration (Share of enterprises with a maximum contracted download speed of the fastest fixed internet connection of at least 100 Mb/s)*	*No regional data*
	Individuals who have above basic overall digital skills	Own estimates using Households with broadband access
INVESTMENTS		
FINANCE AND SUPPORT	R&D expenditure in the public sector as percentage of GDP	Identical
	Venture capital expenditure as percentage of GDP	*No regional data*
	Direct government funding and government tax support for business R&D	*No regional data*
FIRM INVESTMENTS	R&D expenditure in the business sector as percentage of GDP	Identical
	Non-R&D innovation expenditures as percentage of total turnover	Data for SMEs
	Innovation expenditures per person employed in innovation-active enterprises	Data for SMEs
USE OF INFORMATION TECHNOLOGIES	Enterprises providing training to develop or upgrade ICT skills of their personnel	No regional data
	Employed ICT specialists	Estimates using Employment in information and communication
INNOVATION ACTIVITIES		
INNOVATORS	SMEs introducing product innovations as percentage of SMEs	Identical
	SMEs introducing business process innovations as percentage of SMEs	Identical
LINKAGES	Innovative SMEs collaborating with others as percentage of SMEs	Identical
	Public-private co-publications per million population	Identical
	Job-to-job mobility of Human Resources in Science & Technology	*No regional data*
INTELLECTUAL ASSETS	PCT patent applications per billion GDP (in Purchasing Power standards)	Identical
	Trademark applications per billion GDP (in Purchasing Power standards)	Identical
	Individual design applications per billion GDP (in Purchasing Power standards)	Design applications
IMPACTS		
EMPLOYMENT IMPACTS	Employment in knowledge-intensive activities as percentage of total employment	Employment in medium-high and high-tech manufacturing and knowledge-intensive services
	Employment in innovative enterprises	Data for SMEs
SALES IMPACTS	*Medium and high-tech product exports as percentage of total product exports*	*No regional data*
	Knowledge-intensive services exports as percentage of total service exports	*No regional data*
	Sales of new-to-market and new-to-enterprise innovations as percentage of total turnover	Data for SMEs
ENVIRONMENTAL SUSTAINABILITY	*Resource productivity*	*No regional data*
	Air emissions in fine particulates (PM2.5) in Industry	Exposure to fine particulates (PM2.5)
	Development of environment-related technologies	*No regional data*

1.3 Regional data availability

Regional innovation data for four indicators are directly available from Eurostat. For Population aged 25-34 having completed tertiary education, Lifelong learning, R&D expenditures in the public sector, R&D expenditures in the business sector, regional data have been extracted from Eurostat's online regional database. Regional patent data have been extracted from the OECD's REGPAT database. For the seven indicators using Community Innovation Survey (CIS) data, regional data are not available from Eurostat, and a special data request has been made to National Statistical Offices to obtain regional CIS data (more details are provided in Chapter 5 on the RIS Methodology). For the three indicators using bibliometric data, regional data have been calculated by Science Metrix as part of a contract with the European Commission (DG Research and Innovation). For Trademark applications and Design applications. regional data have been calculated by Fraunhofer ISI as part of the same contract with the European Commission (DG Research and Innovation) using raw data made available by the European Union Intellectual Property Office (EUIPO). For the other four indicators, estimates were used as explained in section 1.2.

2. Regional innovation performance

This chapter discusses the most recent innovation performance of regions in EU Member States and neighbouring countries, differentiating between 12 innovation performance sub-groups, 3 per main innovation group as used in the European Innovation Scoreboard: Innovation Leaders, Strong Innovators, Moderate Innovators, and Emerging Innovators.

This chapter also presents maps for each country showing the geographic location of each region and changes in innovation performance over time, including a discussion of performance change relative to that of the EU.

2.1 Regional performance groups

Europe's regions are grouped into four innovation performance groups according to their performance on the Regional Innovation Index relative to that of the EU. The thresholds in relative performance are the same as those used in the European Innovation Scoreboard:

- The group of Innovation Leaders includes 36 regions performing more than 125% above the EU average.
- The group of Strong Innovators includes 70 regions performing between 100% and 125% of the EU average.
- The group of Moderate Innovators includes 69 regions performing between 70% and 100% of the EU average.
- The group of Emerging Innovators includes 64 regions performing below 70% of the EU average.

The most innovative regions, on average, perform best on most of the indicators (Table 3)[3]. The Innovation Leaders, on average, have the highest performance on 18 indicators. They perform below the EU average on Non-R&D innovation expenditures and close to the EU average on Innovation expenditures per person employed and Sales of new-to-market and new-to-enterprise innovations, all three indicators using data from the Community Innovation Survey.

The Innovation Leaders perform particularly well, with average performance levels of 50% or more above the EU average, on Population aged 25-34 having completed tertiary education, Population aged 25-64 participating in lifelong learning, International scientific co-publications, Employed ICT specialists, Public-private co-publications, PCT patent applications, and Trademark applications.

The Strong Innovators perform above average on all indicators, although on several indicators only marginally. For nine indicators performance is about 20% or more above the EU average: Population aged 25-64 participating in lifelong learning, International scientific co-publications, Individuals who have above basic overall digital skills, R&D expenditures in the business sector, Innovation expenditures per person employed, Innovative SMEs collaborating with others, Public-private co-publications, PCT patent applications, and Employment in innovative SMEs.

The Moderate Innovators perform above the EU average on six indicators: Non-R&D innovation expenditures, Innovation expenditures per person employed, SMEs with product innovations, SMEs with business process innovations, Employment in innovative SMEs, and Sales of new-to-market and new-to-enterprise innovations.

The Emerging Innovators perform below the EU average on all indicators, and for four indicators performance is below 50% of the EU average: Population aged 25-64 participating in lifelong learning, International scientific co-publications, Employed ICT specialists, and PCT patent applications. For three indicators performance is above 70% of the EU average: Non-R&D innovation expenditures, Design applications, and Sales of new-to-market and new-to-enterprise innovations.

Despite the variation in regional performance within countries, regional performance groups largely match the corresponding EIS country performance groups:

- All regional Innovation Leaders belong to countries identifiedas Innovation Leaders or Strong Innovators in the EIS. The only exception is *Praha* (CZ01) as Czechia is a Moderate Innovator in the EIS.
- Most regional Strong Innovators belong to EIS Innovation Leader and Strong Innovator countries, only 10 regional Strong Innovators belong to EIS Moderate Innovator countries.
- Most (61%) regional Moderate Innovators belong to EIS Moderate Innovator countries, but a significant share (27%) of regions belong to the EIS Strong Innovators.
- Almost all (97%) of the regional Emerging Innovators belong to EIS Moderate Innovator and Emerging Innovator countries.

Regional 'pockets of excellence' can be identified in several Moderate Innovator countries (Annex 3): *Praha* (CZ01) in Czechia, *País Vasco* (ES21) in Spain, *Provincia Autonoma Trento* (ITH2), *Friuli-Venezia Giulia* (ITH4) and *Emilia-Romagna* (ITH5) in Italy, and *Budapest* (HU11) in Hungary, and Emerging Innovator countries: *Grad Zagreb* (HR01) in Croatia, *Warszawski stoleczny* (PL91) and *Malopolskie* (PL21) in Poland, *Bratislavský kraj* (SK01) in Slovakia, and *Belgrade* (RS11) in Serbia. At the same time, some regions in EIS Innovation Leader and Strong Innovator countries perform in 'lower' performance groups, with 3 regions in Innovation Leader countries being a regional Moderate Innovator, 18 regions in Strong Innovator countries being a regional Moderate Innovator, and two regions in one of the Strong Innovator countries being a regional Emerging Innovator.

[3] The strong performance of both Moderate and Emerging Innovators on Non-R&D innovation expenditures reflects the fact that in less innovative countries it is more common for enterprises to innovate by purchasing advanced machinery and equipment and knowledge developed elsewhere, than to invest in own R&D activities, which are typically more expensive and at higher risk of failing to result in a useful product or process innovation.

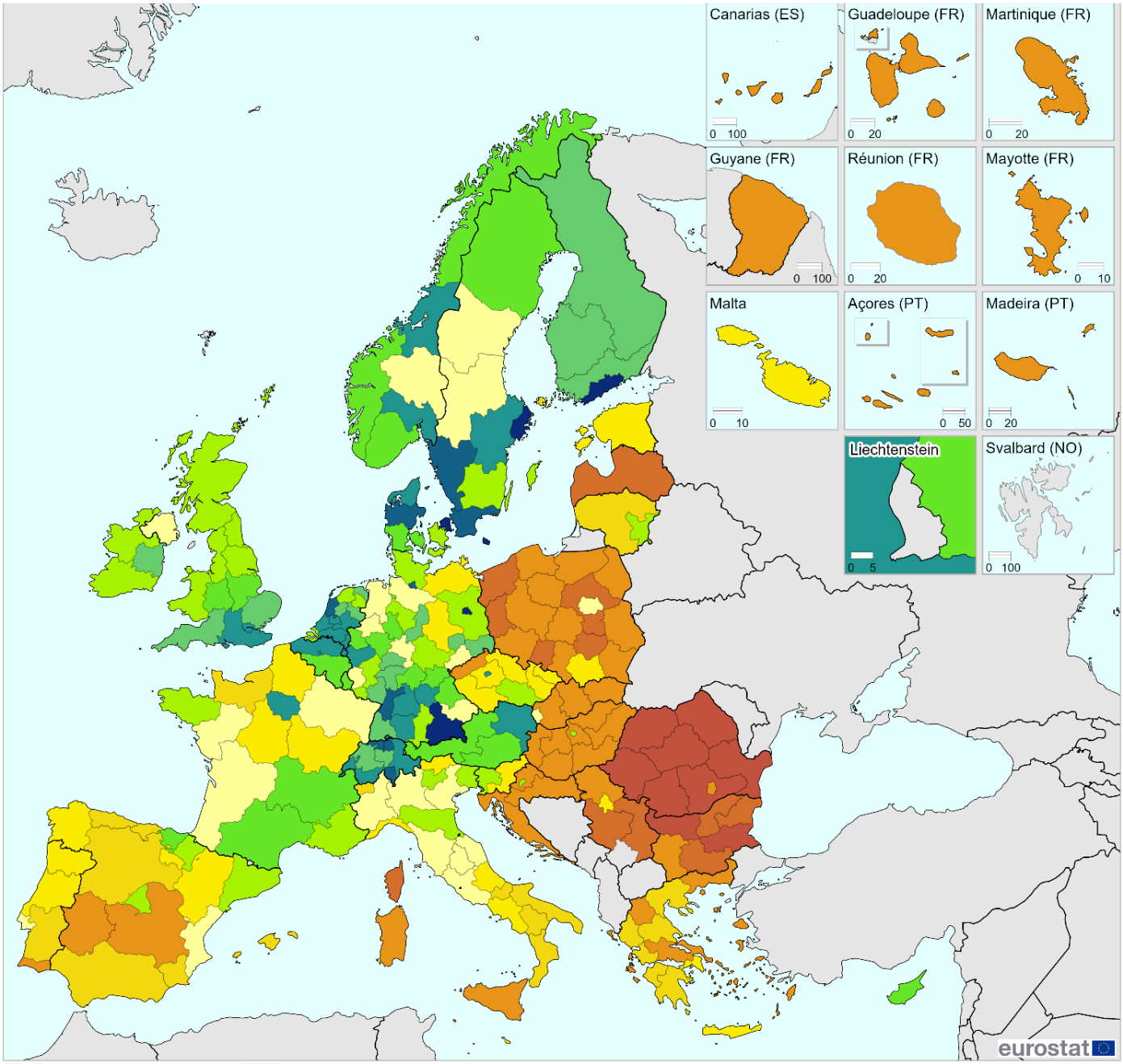
Table 3: Average indicator scores by regional performance group

	Innovation Leaders	Strong Innovators	Moderate Innovators	Emerging Innovators
Population aged 25-34 having completed tertiary education	153	113	91	64
Population aged 25-64 participating in lifelong learning	173	128	88	41
International scientific co-publications	211	126	78	33
Most-cited scientific publications	136	117	97	63
Individuals who have above basic overall digital skills	136	120	92	66
R&D expenditures in the public sector	140	118	92	66
R&D expenditures in the business sector	143	125	88	61
Non-R&D innovation expenditures	82	101	107	90
Innovation expenditures per person employed	118	120	102	55
Employed ICT specialists	172	103	69	39
SMEs with product innovations	134	112	103	65
SMEs with business process innovations	130	115	109	58
Innovative SMEs collaborating with others	130	130	100	51
Public-private co-publications	163	120	89	54
PCT patent applications	171	132	86	40
Trademark applications	157	105	99	63
Design applications	130	110	94	78
Employment in knowledge-intensive activities	149	115	88	67
Employment in innovative SMEs	134	121	102	56
Sales of new-to-market and new-to-enterprise innovations	105	102	114	79
Air emissions in fine particulates (PM2.5) in Industry	113	101	99	68

Average scores for each performance group relative to the EU average (=100). Scores calculated excluding countries for which statistical regions at NUTS 1 and NUTS 2 do not exist (Cyprus, Estonia, Latvia, Luxembourg and Malta). Scores have been corrected, since the average of the unweighted group averages is either above or below 100 for all indicators.[4] The correction makes sure that this average is equal to the EU average of 100. Full details are provided in the RIS 2023 Methodology Report.

[4] For several indicators, average performance scores for all four groups are either below or close to 100, whereas one would expect to see more scores above 100 as the EU average is the average of all regions and performance groups. However, for several reasons the EU average seems to be too high for some indicators. The most important explanation is that where the EU average is a weighted average with larger regions/countries having a larger contribution to this average than smaller regions/countries, the average group performance scores are unweighted averages with equal contributions for all regions, irrespective if these are larger NUTS 1 or smaller NUTS 2 regions. Another explanation is that the EU also includes the performance of Cyprus, Estonia, Latvia, Luxembourg, and Malta, whereas these countries are not included in the average scores for the regional performance groups.

Figure 1: Regional performance groups



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

For Cyprus, Estonia, Latvia, Luxembourg and Malta, performance group membership is identical to that in the EIS 2023 report. For these countries, the corresponding colour codes for the middle sub-group of regions have been used.

Providing more detail: defining 12 performance sub-groups

For most countries, there is limited variation in regional performance groups. Only in Czechia and France there is at least one region in each of all four regional performance groups. In 7 countries, there is at least one region in three different regional performance groups, and in 14 countries there is at least one region in two different regional performance groups. In Bulgaria, Ireland, and Romania, all regions are in the same performance group.

Three subgroups are defined within each performance group by dividing the performance range in each group in three equal parts: the top one-third regions (+), the middle one-third regions and the bottom one-third regions (-) (Table 4).

Table 4: Defining performance sub-groups

Group	*Top sub-group (+)*	*Middle sub-group*	*Bottom sub-group (-)*
Innovation Leaders	Innovation Leaders + Above 145.9% of EU average	Innovation Leaders Between 135.4% and 145.9% of EU average	Innovation Leaders - Between 125% and 135.4% of EU average
Strong Innovators	Strong Innovators + Between 116.7% and 125% of EU average	Strong Innovators Between 108.3% and 116.7% of EU average	Strong Innovators – Between 100% and 108.3% of EU average
Moderate Innovators	Moderate Innovators + Between 90% and 100% of EU average	Moderate Innovators Between 80% and 90% of EU average	Moderate Innovators – Between 70% and 80% of EU average
Emerging Innovators	Emerging Innovators + Between 53.0% and 70% of EU average	Emerging Innovators Between 36.0% and 53.0% of EU average	Emerging Innovators – Below 36.0% of EU average

Most of the Innovation Leaders and Strong Innovators are in Northern and Western Europe. Most of the Moderate Innovators and Emerging Innovators are in Eastern and Southern Europe. A geographical map of the regional performance subgroups is shown in Figure 1:

- Innovation Leaders are shown using three shades of blue, with the darkest blue showing the Innovation Leaders + and the lightest blue the Innovation Leaders -.
- Strong Innovators are shown using three shades of green, with the darkest green showing the Strong Innovators + and the lightest green the Strong Innovators -.
- Moderate Innovators are shown using three shades of yellow, with the lightest yellow showing the Moderate Innovators + and the darkest yellow the Moderate Innovators -.
- Emerging Innovators are shown using three shades of orange, with the lightest orange showing the Emerging Innovators + and the darkest orange the Emerging Innovators -.

At the level of subgroups, there is more diversity in performance of regional innovation systems within countries

- In France, Germany and Spain, there are eight different performance subgroups.
- In Sweden there are six different performance subgroups.
- In Denmark, Italy, and the United Kingdom there are five different performance subgroups.
- In Czechia, Greece, the Netherlands, Portugal, and Poland there are four different performance subgroups.

Table 5: Occurrence of regional performance groups by country

	Performance group EIS	Innovation Leaders			Strong Innovators			Moderate Innovators			Emerging Innovators		
	2023	+		-	+		-	+		-	+		-
All countries		5	9	22	18	20	32	25	24	20	42	12	10
Switzerland	Innovation Leader		3	2	2								
Denmark	Innovation Leader	1	1	1		1	1						
Sweden	Innovation Leader	1	2	1		1	1	2					
Finland	Innovation Leader	1			3					1			
Netherlands	Innovation Leader		1	5	3		3						
Belgium	Innovation Leader			2		1							
Austria	Strong Innovator			1		2							
Norway	Strong Innovator			2		3		1					
Germany	Strong Innovator	2	2	4	7	7	7	7	2				
Ireland	Strong Innovator				1		2						
United Kingdom	Strong Innovator			2	2	2	5	1					
France	Strong Innovator			1		2	2	3	3	1	1	1	
Slovenia	Moderate Innovator						1		1				
Czechia	Moderate Innovator			1			1		5		1		
Italy	Moderate Innovator						3	7	4	5	2		
Spain	Moderate Innovator					1	3	1	3	6	3	1	1
Portugal	Moderate Innovator							1	2	1	3		
Lithuania	Moderate Innovator						1			1			
Greece	Moderate Innovator							1	1	5	6		
Hungary	Moderate Innovator						1				7		
Croatia	Emerging Innovator						1				3		
Slovakia	Emerging Innovator							1			3		
Serbia	Emerging Innovator								1		1	2	
Poland	Emerging Innovator							1	1		10	5	
Bulgaria	Emerging Innovator										1	3	2
Romania	Emerging Innovator										1		7

Countries ordered by their performance score in the European Innovation Scoreboard 2023.

2.2 Most innovative regions

The most innovative region overall and in the EU in 2023 is *Hovedstaden* (DK01) in Denmark, followed by *Helsinki-Uusimaa* (FI1B) in Finland, *Oberbayern* (DE21) in Germany, *Stockholm* (SE11) in Sweden, and *Berlin* (DE3) in Germany (**Table 6**). Seven out of the top-25 regions in 2023 are from Germany, four from the Netherlands and Switzerland, three from Sweden, two from Denmark and the United Kingdom, and one from Belgium, Finland and Norway. *Hovedstaden* (DK01) was also the most innovative region in 2019 and 2021, and in 2017 *Zürich* (CH04) was the most innovative region.

The top-ranking region in 2023 in the Strong Innovators group is *Groningen* (NL11) in the Netherlands (**Table 7**), followed by *Braunschweig* (DE91) and *Gießen* (DE72). All top-10 regions in the Strong Innovators group perform at least 20% above the EU average.

Lisboa (PT17) in Portugal is the top-ranking region in the Moderate Innovators group, with a performance close to that of the EU average. *Marche* (ITI3) ranks second and *Chemnitz* (DED4) ranks third. Almost all top-10 regions in the Moderate Innovators group perform less than 3%-points below the EU average.

In the Emerging Innovators group, *Sardegna* (ITG2) ranks first, followed by *Dolnoslaskie* (PL51) and *Dytiki Makedonia* (EL53). All top-10 regions in the Emerging Innovators group perform between 67% and 70% of the EU average.

Table 6: Top-25 Regional Innovation Leaders

	2017	2019	2021	2023	RII2023
1	Zürich (CH04)	Hovedstaden (DK01)	Hovedstaden (DK01)	Hovedstaden (DK01)	156.3
2	Hovedstaden (DK01)	Zürich (CH04)	Stockholm (SE11)	Helsinki-Uusimaa (FI1B)	152.1
3	Stockholm (SE11)	Stockholm (SE11)	Oberbayern (DE21)	Oberbayern (DE21)	151.5
4	Oberbayern (DE21)	Berlin (DE3)	Zürich (CH04)	Stockholm (SE11)	149.8
5	Nordwestschweiz (CH03)	Helsinki-Uusimaa (FI1B)	Berlin (DE3)	Berlin (DE3)	147.5
6	Berlin (DE3)	Oberbayern (DE21)	Helsinki-Uusimaa (FI1B)	Zürich (CH04)	143.4
7	Karlsruhe (DE12)	Karlsruhe (DE12)	Ticino (CH07)	Karlsruhe (DE12)	142.4
8	Helsinki-Uusimaa (FI1B)	Nordwestschweiz (CH03)	Karlsruhe (DE12)	Midtjylland (DK04)	140.7
9	Noord-Holland (NL32)	Ticino (CH07)	Nordwestschweiz (CH03)	Ticino (CH07)	138.9
10	Utrecht (NL31)	Noord-Holland (NL32)	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	Västsverige (SE23)	138.5
11	Sydsverige (SE22)	Utrecht (NL31)	Sydsverige (SE22)	Nordwestschweiz (CH03)	137.1
12	Île de France (FR1)	Ostschweiz (CH05)	Midtjylland (DK04)	Noord-Holland (NL32)	137.1
13	Tübingen (DE14)	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	Noord-Holland (NL32)	Hamburg (DE6)	136.5
14	London (UKI)	London (UKI)	Västsverige (SE23)	Sydsverige (SE22)	136.0
15	South East (UK) (UKJ)	South East (UK) (UKJ)	Ostschweiz (CH05)	Utrecht (NL31)	134.0
16	Zentralschweiz (CH06)	Zuid-Holland (NL33)	Utrecht (NL31)	London (UKI)	131.1
17	Région lémanique (CH01)	Région lémanique (CH01)	Hamburg (DE6)	Zuid-Holland (NL33)	131.1
18	Västsverige (SE23)	Midtjylland (DK04)	Braunschweig (DE91)	Ostschweiz (CH05)	130.9
19	Ostschweiz (CH05)	Île de France (FR1)	South East (UK) (UKJ)	Köln (DEA2)	130.8
20	Midtjylland (DK04)	Sydsverige (SE22)	Île de France (FR1)	Oslo og Viken (NO08)	130.6
21	Stuttgart (DE11)	Noord-Brabant (NL41)	London (UKI)	Tübingen (DE14)	130.6
22	Zuid-Holland (NL33)	Zentralschweiz (CH06)	Vlaams Gewest (BE2)	South East (UKJ)	130.3
23	Mittelfranken (DE25)	Tübingen (DE14)	Rheinhessen-Pfalz (DEB3)	Vlaams Gewest (BE2)	130.3
24	Freiburg (DE13)	Västsverige (SE23)	Région lémanique (CH01)	Mittelfranken (DE25)	130.2
25	Trøndelag (NO06)	Mittelfranken (DE25)	Zentralschweiz (CH06)	Noord-Brabant (NL41)	129.8

Table 7: Top-10 Regions by regional performance group

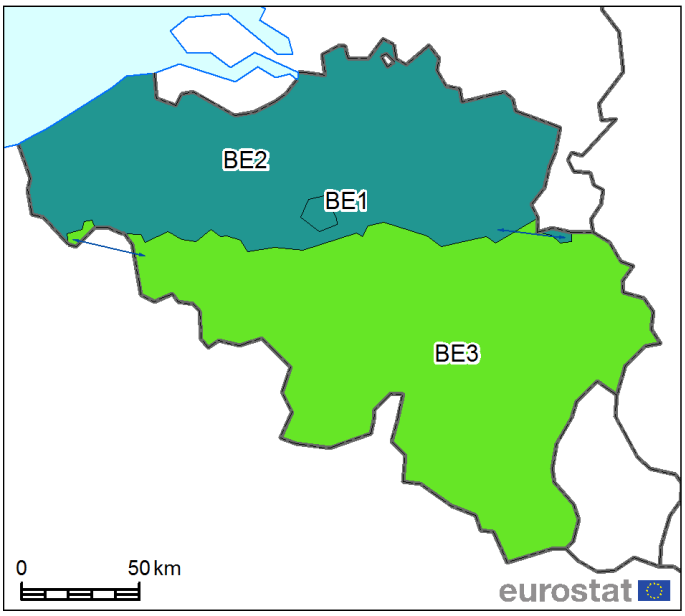
Top-10 Strong Innovators			Top-10 Moderate Innovators			Top-10 Emerging Innovators		
Rank	Region	RII2023	Rank	Region	RII2023	Rank	Region	RII2023
1	**Groningen (NL11)**	124.9	1	**Lisboa (PT17)**	99.8	1	**Sardegna (ITG2)**	69.4
2	Braunschweig (DE91)	124.5	2	Marche (ITI3)	98.7	2	Dolnoslaskie (PL51)	69.4
3	Gießen (DE72)	124.5	3	Chemnitz (DED4)	98.5	3	Dytiki Makedonia (EL53)	69.3
4	Dresden (DED2)	124.0	4	Umbria (ITI2)	98.0	4	Sterea Ellada (EL64)	69.2
5	Eastern and Midland (IE06)	124.0	5	Veneto (ITH3)	97.9	5	Anatoliki Makedonia, Thraki (EL51)	68.6
6	Länsi-Suomi (FI19)	123.7	6	Lazio (ITI4)	97.6	6	Sjeverna Hrvatska (HR06)	68.1
7	Zentralschweiz (CH06)	123.0	7	Lombardia (ITC4)	97.4	7	Algarve (PT15)	67.7
8	Espace Mittelland (CH02)	122.9	8	Münster (DEA3)	97.3	8	Sicilia (ITG1)	67.3
9	Pohjois- ja Itä-Suomi (FI1D)	122.0	9	Lüneburg (DE93)	97.1	9	Pest (HU12)	67.2
10	Darmstadt (DE71)	122.0	10	Niederbayern (DE22)	97.1	10	Castilla-la Mancha (ES42)	67.0

2.3 Regional performance differences within countries

This section summarizes for each country the performance of the regions within that country. For each country, a map shows the location of the regions in that country. NUTS codes for the regions that include the country's capital city are highlighted in bold.

For every country a table is included that shows the following information for each region and the country as a whole: RII or relative to EU performance in 2023; rank performance in 2023 across all regions; performance sub-group; and performance change calculated as the difference between the performance in 2023 and 2016 both relative to that of the EU in 2016.

Belgium



Map administrative boundaries: ©EuroGeographics ©UN-FAO ©Turkstat

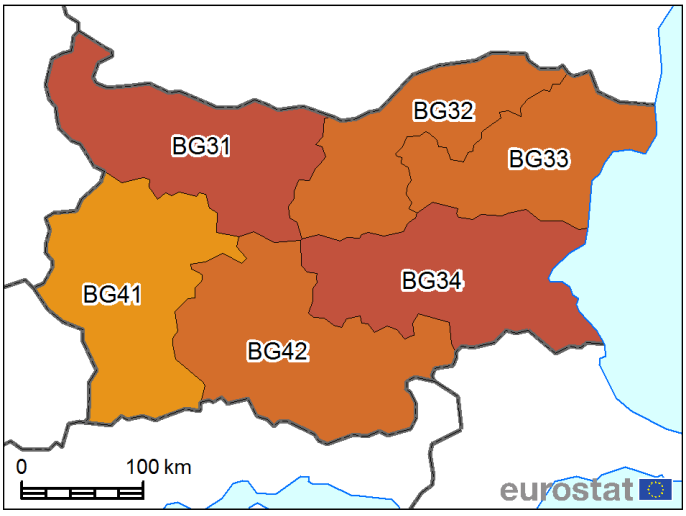
NUTS	Region	RII	Rank	Group	Change
BE	Belgium	125.8	--	Leader	14.1
BE1	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest	129.3	28	Leader -	14.2
BE2	Vlaams Gewest	130.3	23	Leader -	13.3
BE3	Région wallonne	113.5	60	Strong	13.9

Belgium is an Innovation Leader and includes three regions.

Both *Région de Bruxelles-Capitale* (BE1), or Brussels-Capital Region, and *Vlaams Gewest* (BE2), or the Flemish Region, are an Innovation Leader -. *Région wallonne* (BE3), or the Walloon Region, is a Strong Innovator.

For all three regions, performance has increased over time and also faster than that of the EU (8.5), with relatively small differences in performance change between the regions.

Bulgaria



Map administrative boundaries: ©EuroGeographics ©UN-FAO ©Turkstat

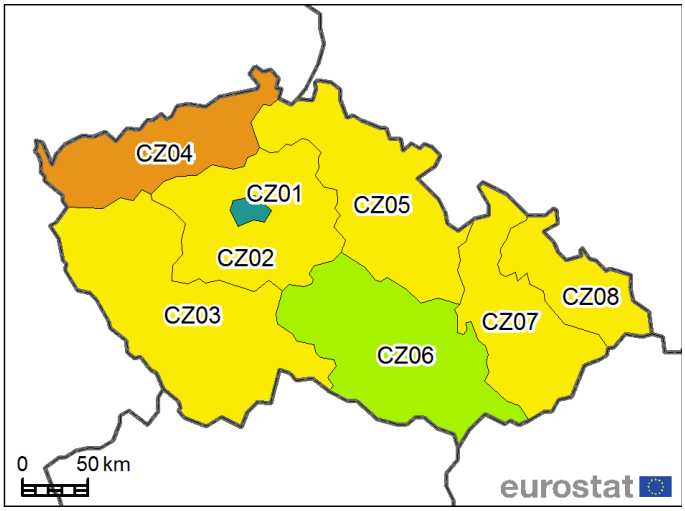
NUTS	Region	RII	Rank	Group	Change
BG	Bulgaria	46.7	--	Emerging	4.4
BG31	Severozapaden	27.2	235	Emerging -	-3.7
BG32	Severen tsentralen	38.8	227	Emerging	4.9
BG33	Severoiztochen	36.2	229	Emerging	0.9
BG34	Yugoiztochen	33.6	233	Emerging -	6.9
BG41	Yugozapaden	61.6	195	Emerging +	8.3
BG42	Yuzhen tsentralen	40.1	226	Emerging	4.8

Bulgaria is an Emerging Innovator and includes six regions.

Yugozapaden (BG41), the capital region, is the only Emerging Innovator +. Three regions are an Emerging Innovator, and two regions are an Emerging Innovator -.

Innovation performance has increased for all regions, except for *Severozapaden* (BG31), but a lower rate than that of the EU (8.5). Performance has increased most for *Yugozapaden* (BG41).

Czechia



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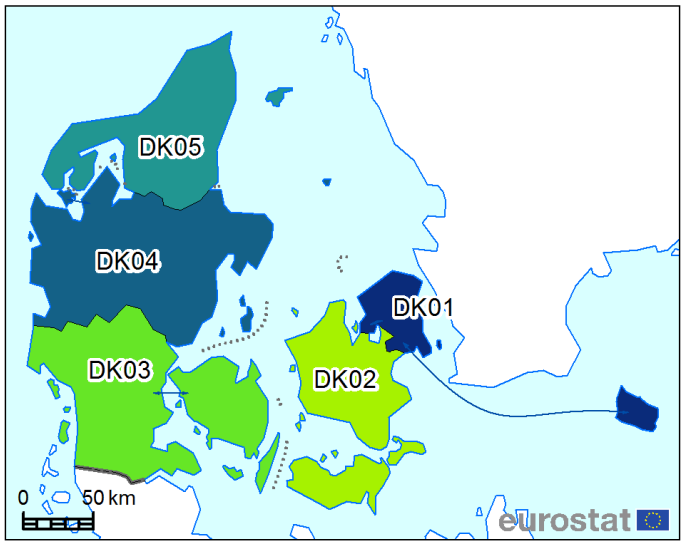
NUTS	Region	RII	Rank	Group	Change
CZ	Czechia	94.7	--	Moderate	21.0
CZ01	Praha	127.6	30	Leader -	24.0
CZ02	Střední Cechy	88.6	137	Moderate	19.7
CZ03	Jihozápad	81.0	153	Moderate	15.6
CZ04	Severozápad	66.0	188	Emerging +	19.0
CZ05	Severovýchod	88.4	140	Moderate	12.2
CZ06	Jihovýchod	101.0	103	Strong -	22.3
CZ07	Střední Morava	88.2	141	Moderate	18.8
CZ08	Moravskoslezsko	86.9	142	Moderate	25.7

Czechia is a Moderate Innovator and includes eight regions.

Praha (CZ01), the capital region, is an Innovation Leader -, performing well above the average performance of the EU. *Jihovýchod* (CZ06) is a Strong Innovator -, five regions are Moderate Innovators, and one region is an Emerging Innovator +.

For all regions performance has increased, also at a higher rate than that of the EU. Performance has increased most strongly for *Moravskoslezsko* (CZ08), *Praha* (CZ01), and *Jihovýchod* (CZ06).

Denmark



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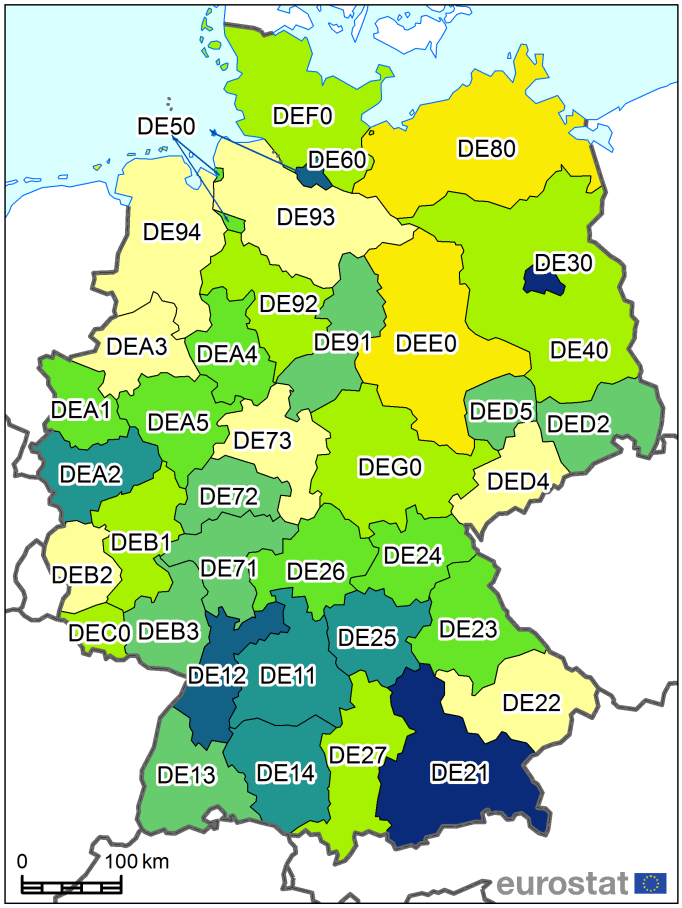
NUTS	Region	RII	Rank	Group	Change
DK	Denmark	137.6	--	Leader	16.0
DK01	Hovedstaden	156.3	1	Leader+	10.7
DK02	Sjælland	105.2	87	Strong -	7.3
DK03	Syddanmark	112.9	63	Strong	10.4
DK04	Midtjylland	140.7	8	Leader	17.3
DK05	Nordjylland	129.6	26	Leader -	29.2

Denmark is an Innovation Leader and includes five regions.

All five regions belong to different performance subgroups. *Hovedstaden* (DK01), the capital region, is an Innovation Leader +, and is the most innovative region of Europe. *Midtjylland* (DK04) is an Innovation Leader, *Nordjylland* (DK05) is an Innovation Leader -, *Syddanmark* (DK03) is a Strong Innovator and *Sjælland* (DK02) is a Strong Innovator -.

Performance has increased for all regions, and most strongly for *Nordjylland* (DK05). For four regions performance has increased at a higher rate than that of the EU (8.5).

Germany



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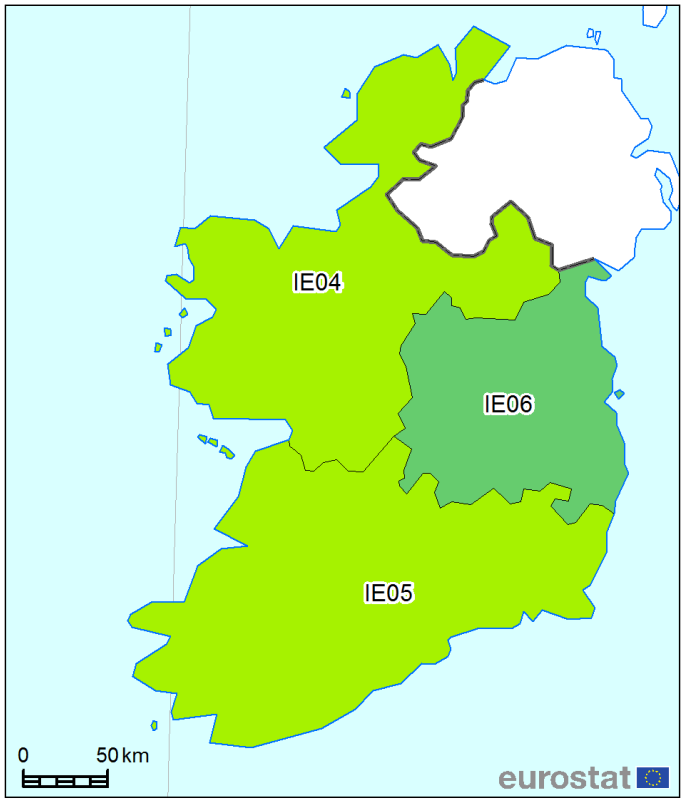
Germany is a Strong Innovator and includes 38 regions.

Oberbayern (DE21) is the most innovative German region and third most innovative region in Europe. *Berlin* (DE3), *Karlsruhe* (DE12), *Hamburg* (DE6), *Köln* (DEA2), *Tübingen* (DE14), and *Mittelfranken* (DE25) are among the top-25 most innovative regions in Europe. In total eight regions are Innovation Leaders, 21 regions are Strong Innovators, and nine regions are Moderate Innovators.

Performance relative to the EU has increased for 34 regions, most strongly for *Hamburg* (DE6) and *Gießen* (DE72). Performance has decreased for four regions: Mecklenburg-Vorpommern (DE8), Münster (DEA3), Trier (DEB2), and Saarland (DEC). For 18 regions performance has increased at a higher rate than that of the EU (8.5), for 20 regions performance has increased (or even decreased) at a lower rate.

NUTS	Region	RII	Rank	Group	Change
DE	Germany	117.8	--	Strong	7.6
DE11	Stuttgart	126.4	33	Leader -	2.8
DE12	Karlsruhe	142.4	7	Leader	8.0
DE13	Freiburg	124.9	38	Strong +	4.2
DE14	Tübingen	130.6	21	Leader -	3.5
DE21	Oberbayern	151.5	3	Leader +	15.5
DE22	Niederbayern	97.0	116	Moderate +	9.1
DE23	Oberpfalz	112.5	65	Strong	9.9
DE24	Oberfranken	111.6	66	Strong	8.3
DE25	Mittelfranken	130.2	24	Leader -	6.6
DE26	Unterfranken	114.1	59	Strong	1.3
DE27	Schwaben	107.2	77	Strong -	1.5
DE3	Berlin	147.5	5	Leader +	8.6
DE4	Brandenburg	102.9	95	Strong -	10.6
DE5	Bremen	114.4	58	Strong	3.5
DE6	Hamburg	136.5	13	Leader	19.4
DE71	Darmstadt	122.0	47	Strong +	8.9
DE72	Gießen	124.5	40	Strong +	16.8
DE73	Kassel	92.0	127	Moderate +	1.9
DE8	Mecklenburg-Vorpommern	84.5	146	Moderate	-2.3
DE91	Braunschweig	124.5	39	Strong +	6.7
DE92	Hannover	106.6	79	Strong -	0.8
DE93	Lüneburg	97.1	115	Moderate +	12.8
DE94	Weser-Ems	92.3	126	Moderate +	7.9
DEA1	Düsseldorf	110.3	70	Strong	10.2
DEA2	Köln	130.8	19	Leader -	11.5
DEA3	Münster	97.3	114	Moderate +	-2.3
DEA4	Detmold	111.3	68	Strong	9.4
DEA5	Arnsberg	109.7	73	Strong	7.5
DEB1	Koblenz	107.1	78	Strong -	13.3
DEB2	Trier	90.4	131	Moderate +	-1.5
DEB3	Rheinhessen-Pfalz	121.5	49	Strong +	8.6
DEC	Saarland	100.2	106	Strong -	-0.4
DED2	Dresden	98.5	109	Moderate +	11.1
DED4	Chemnitz	124.0	41	Strong +	14.1
DED5	Leipzig	119.9	51	Strong +	9.5
DEE	Sachsen-Anhalt	89.3	134	Moderate	10.4
DEF	Schleswig-Holstein	104.9	88	Strong -	5.7
DEG	Thüringen	105.7	83	Strong -	7.1

Ireland



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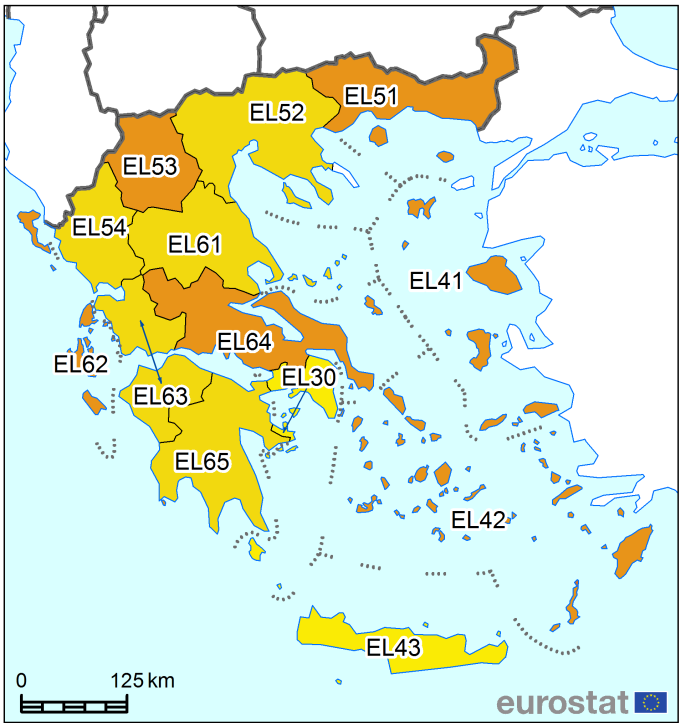
NUTS	Region	RII	Rank	Group	Change
IE	Ireland	115.8	--	Strong	2.3
IE04	Northern and Western	104.5	90	Strong -	5.2
IE05	Southern	105.4	86	Strong -	-6.7
IE06	Eastern and Midland	124.0	42	Strong +	4.3

Ireland is a Strong Innovator and includes three regions.

Eastern and Midland (IE06) is a Strong Innovator +. Both Northern and Western (IE04) and Southern (IE05) are a Strong Innovator -with performance scores about 20%-points below that of Eastern and Midland (IE06).

Performance has decreased for Southern (IE05) and increased for the other two regions. For all regions performance has increased (or even decreased) at a lower rate than that of the EU (8.5).

Greece



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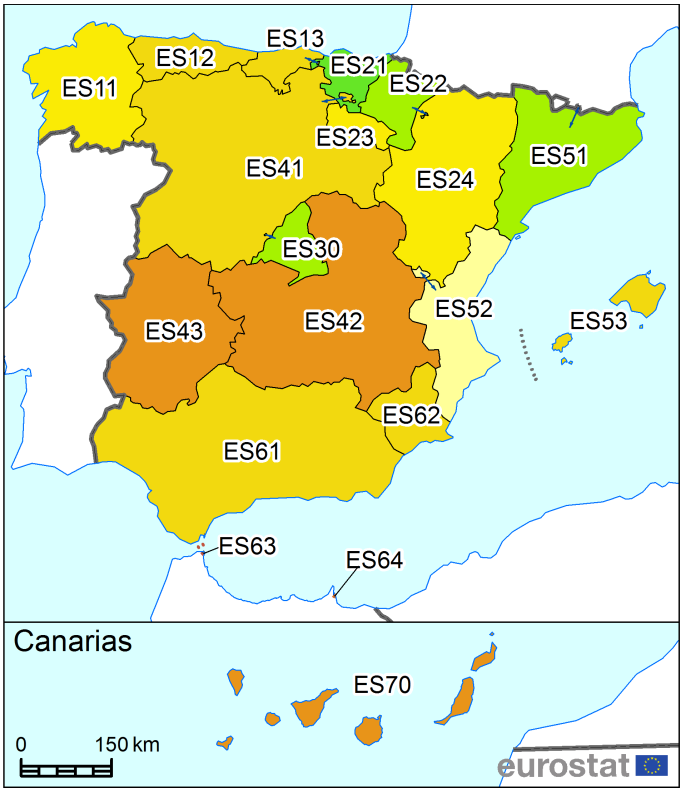
NUTS	Region	RII	Rank	Group	Change
EL	Greece	79.5	--	Moderate	22.2
EL3	Attiki	90.0	132	Moderate	21.9
EL41	Voreio Aigaio	57.5	207	Emerging +	10.6
EL42	Notio Aigaio	55.4	215	Emerging +	14.5
EL43	Kriti	82.4	149	Moderate	13.7
EL51	Anatoliki Makedonia, Thraki	68.7	180	Emerging +	24.6
EL52	Kentriki Makedonia	79.8	156	Moderate -	24.8
EL53	Dytiki Makedonia	69.3	178	Emerging +	25.2
EL54	Ipeiros	78.4	158	Moderate -	33.1
EL61	Thessalia	72.3	170	Moderate -	25.9
EL62	Ionia Nisia	55.8	212	Emerging +	14.0
EL63	Dytiki Ellada	76.5	164	Moderate -	20.9
EL64	Sterea Ellada	69.3	179	Emerging +	22.7
EL65	Peloponnisos	71.0	173	Moderate -	30.8

Greece is a Moderate Innovator and includes 13 regions.

Attiki (EL3) is the most innovative Greek region and, as Kriti (EL43), a Moderate Innovator. Five regions are Moderate Innovators -, and six regions are Emerging Innovator +.

Performance has increased for all regions and also at a higher rate than that of the EU (8.5). Performance has increased most strongly for Ipeiros (EL54) and Peloponnisos (EL65).

Spain



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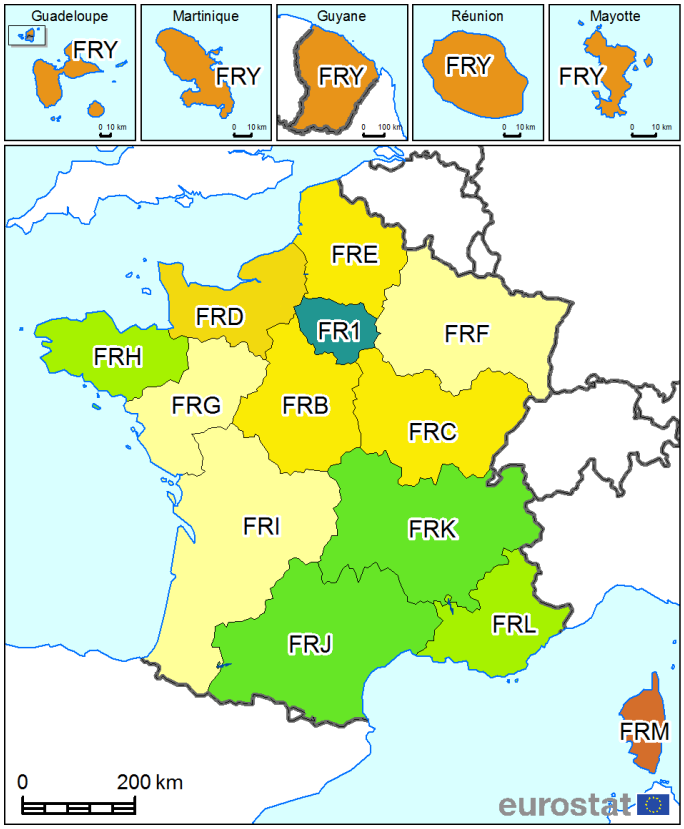
NUTS	Region	RII	Rank	Group	Change
ES	Spain	89.2	--	Moderate	9.7
ES11	Galicia	80.7	154	Moderate	8.4
ES12	Principado de Asturias	76.9	161	Moderate -	8.7
ES13	Cantabria	76.9	160	Moderate -	10.1
ES21	País Vasco	109.8	72	Strong	11.5
ES22	Comunidad Foral de Navarra	101.8	98	Strong -	14.1
ES23	La Rioja	83.1	148	Moderate	6.5
ES24	Aragón	83.6	147	Moderate	7.4
ES3	Comunidad de Madrid	106.6	80	Strong -	12.8
ES41	Castilla y León	78.9	157	Moderate -	10.9
ES42	Castilla-la Mancha	67.0	185	Emerging +	3.6
ES43	Extremadura	65.0	189	Emerging +	8.6
ES51	Cataluña	105.9	81	Strong -	11.5
ES52	Comunitat Valenciana	94.0	121	Moderate +	10.6
ES53	Illes Balears	71.1	171	Moderate -	9.2
ES61	Andalucía	71.1	172	Moderate -	4.5
ES62	Región de Murcia	76.7	162	Moderate -	7.1
ES63	Ciudad de Ceuta	35.3	231	Emerging -	2.2
ES64	Ciudad de Melilla	46.3	223	Emerging	2.8
ES7	Canarias	57.2	208	Emerging +	11.7

Spain is a Moderate Innovator and includes 19 regions.

Regional performance differences are high with the best performing region, País Vasco (ES21), performing more than three times as well as the lowest performing region, Ciudad de Ceuta (ES63). Four regions are Strong Innovators, 10 regions are Moderate Innovators, and five regions are Emerging Innovators.

Performance has increased for all regions, and most strongly for Comunidad Foral de Navarra (ES22). For 11 regions performance has increased at a higher rate than that of the EU (8.5), for eight regions performance has increased at a lower rate.

France



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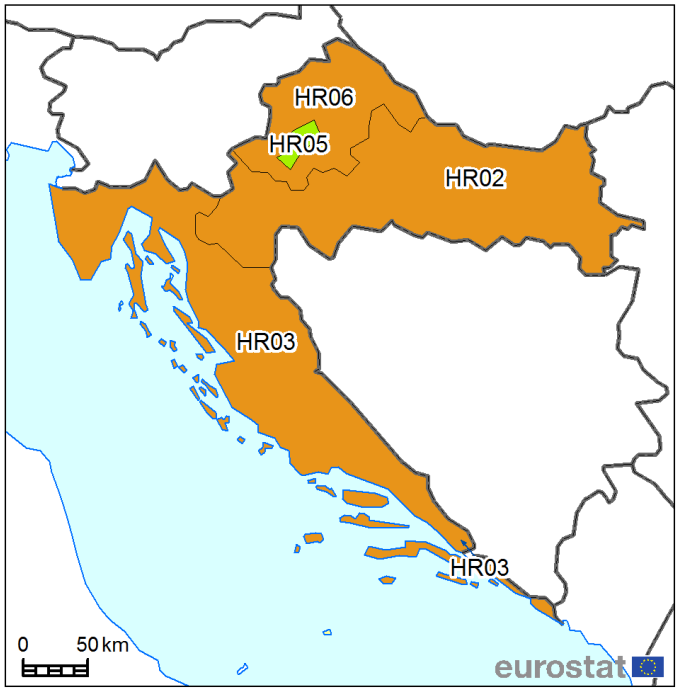
NUTS	Region	RII	Rank	Group	Change
FR	France	105.3	--	Strong	-1.6
FR1	Île de France	129.5	27	Leader -	-0.7
FRB	Centre - Val de Loire	88.5	138	Moderate	-5.4
FRC	Bourgogne - Franche-Comté	89.4	133	Moderate	-10.4
FRD	Normandie	76.1	165	Moderate -	-13.1
FRE	Hauts-de-France	82.4	150	Moderate	-0.9
FRF	Grand Est	93.2	123	Moderate +	-5.9
FRG	Pays de la Loire	95.8	117	Moderate +	0.3
FRH	Bretagne	103.3	92	Strong -	-1.5
FRI	Nouvelle-Aquitaine	91.9	128	Moderate +	-6.5
FRJ	Occitanie	109.9	71	Strong	-8.3
FRK	Auvergne - Rhône-Alpes	111.4	67	Strong	-7.0
FRL	Provence-Alpes-Côte d'Azur	103.3	93	Strong -	-4.7
FRM	Corse	46.5	222	Emerging	-3.6
FRY	Régions ultrapériphériques	64.4	190	Emerging +	5.4

France is a Strong Innovator and includes 14 regions.

Île de France (FR1), the capital region, is the only Innovation Leader. There are four Strong, seven Moderate, and two Emerging innovators

Performance has improved for only two regions, and most strongly for Régions ultrapériphériques françaises (FRY). Performance has decreased for 12 regions, resulting in a declining performance for France as a country. For all regions performance has increased (or even decreased) at a lower rate than that of the EU (8.5).

Croatia



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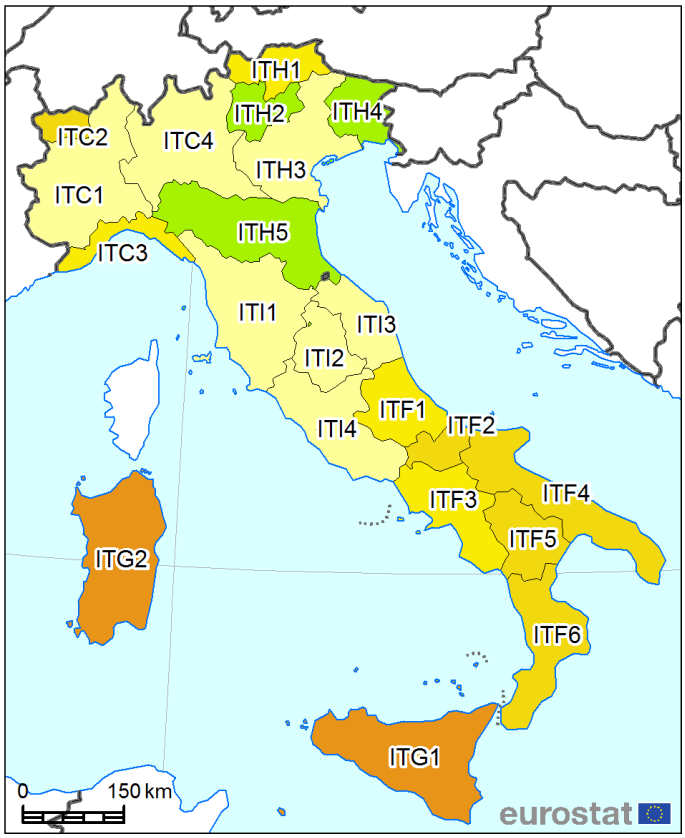
NUTS	Region	RII	Rank	Group	Change
HR	Croatia	69.6	--	Emerging	14.8
HR02	Panonska Hrvatska	60.6	196	Emerging +	5.5
HR03	Jadranska Hrvatska	66.9	186	Emerging +	12.3
HR05	Grad Zagreb	102.8	96	Strong -	22.2
HR06	Sjeverna Hrvatska	68.1	181	Emerging +	8.9

Croatia is an Emerging Innovator and includes four regions.

Grad Zagreb (HR05), the capital region, is a Strong Innovator -performing above the EU average. The other regions are Emerging Innovators +.

Performance has increased for all regions, most strongly for Grad Zagreb (HR05). For three regions performance has increased at a higher rate than that of the EU (8.5), only for Panonska Hrvatska (HR02) the performance increase has been lower than that of the EU.

Italy



Map administrative boundaries: ©EuroGeographics ©UN-FAO ©Turkstat

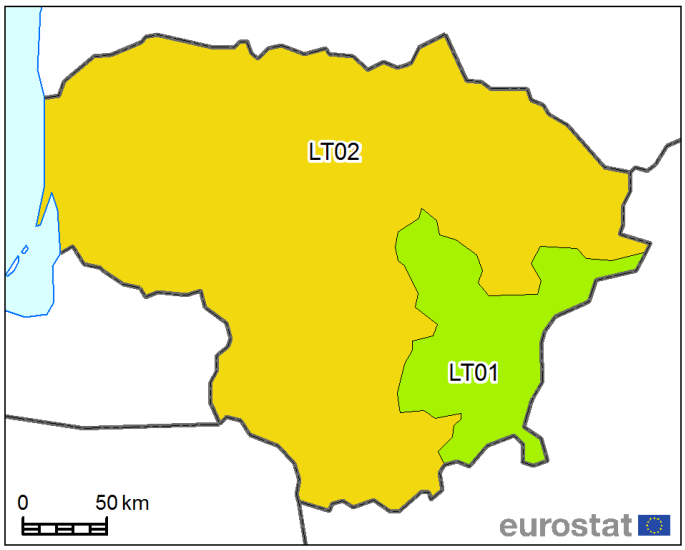
NUTS	Region	RII	Rank	Group	Change
IT	Italy	90.3	--	Moderate	15.6
ITC1	Piemonte	95.4	118	Moderate +	17.6
ITC2	Valle d'Aosta/ Vallée d'Aoste	72.8	169	Moderate -	7.8
ITC3	Liguria	89.1	136	Moderate	17.4
ITC4	Lombardia	97.4	113	Moderate +	15.0
ITH1	Provincia Autonoma Bolzano/Bozen	88.5	139	Moderate	13.4
ITH2	Provincia Autonoma Trento	100.8	104	Strong -	13.3
ITH3	Veneto	97.9	111	Moderate +	14.7
ITH4	Friuli-Venezia Giulia	101.0	102	Strong -	13.5
ITH5	Emilia-Romagna	101.2	101	Strong -	15.8
ITI1	Toscana	93.1	124	Moderate +	12.3
ITI2	Umbria	98.0	110	Moderate +	17.9
ITI3	Marche	98.7	108	Moderate +	27.8
ITI4	Lazio	97.6	112	Moderate +	17.9
ITF1	Abruzzo	89.2	135	Moderate	26.0
ITF2	Molise	76.9	159	Moderate -	16.8
ITF3	Campania	81.0	152	Moderate	23.3
ITF4	Puglia	76.5	163	Moderate -	19.2
ITF5	Basilicata	74.4	166	Moderate -	19.8
ITF6	Calabria	74.2	167	Moderate -	20.4
ITG1	Sicilia	67.3	183	Emerging +	15.5
ITG2	Sardegna	69.4	176	Emerging +	12.3

Italy is a Moderate Innovator and includes 21 regions.

There are three Strong Innovators, 16 Moderate Innovators and two Emerging Innovators.

Performance has increased for all regions, and most strongly for Marche (ITI3) and Abruzzo (ITF1). For 20 regions performance has also increased at a higher rate than that of the EU (8.5), only for Valle d'Aosta/ Vallée d'Aoste (ITC2) the performance increase was below that of the EU.

Lithuania



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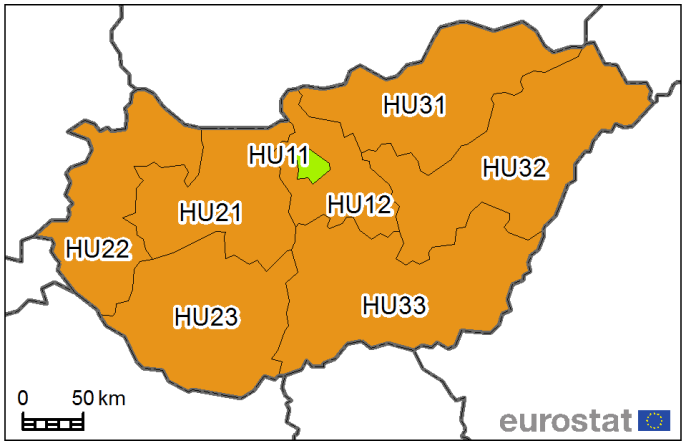
NUTS	Region	RII	Rank	Group	Change
LT	Lithuania	83.8	--	Moderate	16.7
LT01	Sostinės regionas	103.1	94	Strong -	17.1
LT02	Vidurio ir vakarų Lietuvos regionas	70.6	174	Moderate -	14.4

Lithuania is a Moderate Innovator and includes two regions.

Sostinės regionas (LT01), the capital region, is the most innovative region and is a Strong Innovator -. Vidurio ir vakarų Lietuvos regionas (LT02) is a Moderate Innovator -.

Performance has increased for both regions, also at higher rate than that of the EU (8.5).

Hungary



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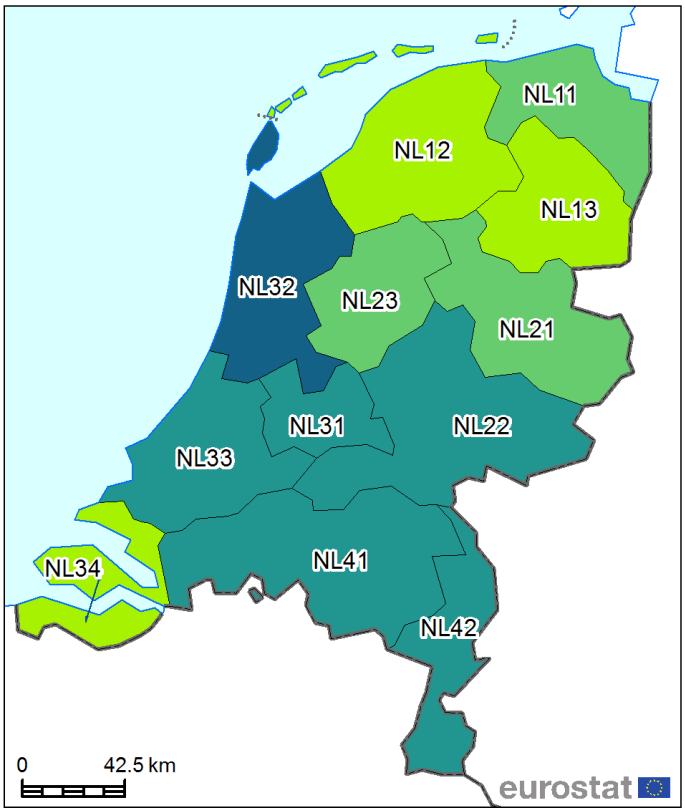
NUTS	Region	RII	Rank	Group	Change
HU	Hungary	70.4	--	Moderate	7.7
HU11	Budapest	101.4	100	Strong -	7.7
HU12	Pest	67.2	184	Emerging +	6.5
HU21	Közép-Dunántúl	60.6	197	Emerging +	3.5
HU22	Nyugat-Dunántúl	59.8	198	Emerging +	9.0
HU23	Dél-Dunántúl	57.8	205	Emerging +	10.8
HU31	Észak-Magyarország	58.4	203	Emerging +	15.2
HU32	Észak-Alföld	55.3	216	Emerging +	6.5
HU33	Dél-Alföld	59.4	200	Emerging +	4.9

Hungary is an Emerging Innovator and includes eight regions.

Budapest (HU11), the capital region, is the most innovative region and a Strong Innovator -. The other regions are all Emerging Innovators +.

Performance has increased for all regions, and most strongly for Észak--Magyarország (HU31) and Dél-Dunántúl (HU23). For three regions performance increased at a higher rate than that of the EU (8.5), for five regions performance increased at a lower rate.

Netherlands



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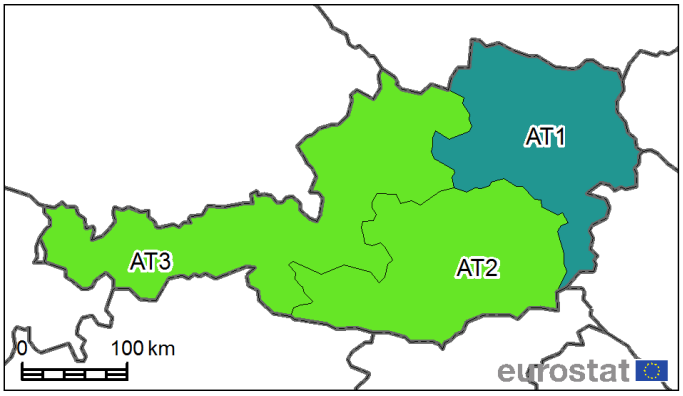
NUTS	Region	RII	Rank	Group	Change
NL	Netherlands	128.7	--	Leader	8.6
NL11	Groningen	124.9	37	Strong +	8.6
NL12	Friesland	100.3	105	Strong -	6.0
NL13	Drenthe	101.6	99	Strong -	0.0
NL21	Overijssel	117.8	53	Strong +	6.1
NL22	Gelderland	127.4	31	Leader -	7.8
NL23	Flevoland	118.8	52	Strong +	10.3
NL31	Utrecht	134.0	15	Leader -	4.5
NL32	Noord-Holland	137.1	12	Leader	7.9
NL33	Zuid-Holland	131.1	17	Leader -	7.5
NL34	Zeeland	105.6	84	Strong -	14.1
NL41	Noord-Brabant	129.8	25	Leader -	9.7
NL42	Limburg	125.7	34	Leader -	10.6

The Netherlands is an Innovation Leader and includes 12 regions.

Noord-Holland (NL32) is the most innovative region and an Innovation Leader. Five regions are Innovation Leaders -, three regions are Strong Innovators +, and three regions are Strong Innovators -. The Netherlands has four regions in the top-25 most innovative regions.

Performance has increased for all regions, and most strongly for Zeeland (NL34). For Drenthe (NL13) performance improved only marginally. For five regions performance increased at a higher rate than that of the EU (8.5), for seven regions performance increased at a lower rate.

Austria



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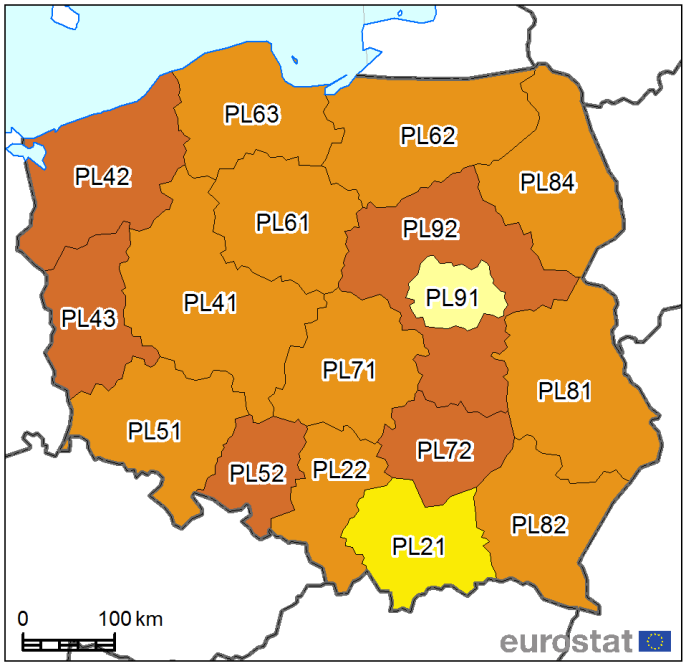
NUTS	Region	RII	Rank	Group	Change
AT	Austria	119.9	--	Strong	6.4
AT1	Ostösterreich	125.7	35	Leader -	10.4
AT2	Südösterreich	116.2	55	Strong	2.7
AT3	Westösterreich	114.7	57	Strong	4.3

Austria is a Strong Innovator and includes three regions.

Ostösterreich (AT1), the capital region, is the most innovative region and an Innovation Leader -. The other regions are Strong Innovators.

Performance has increased for all regions, most strongly for Ostösterreich (AT1), and only for this region performance increased at a higher rate than that of the EU (8.5).

Poland



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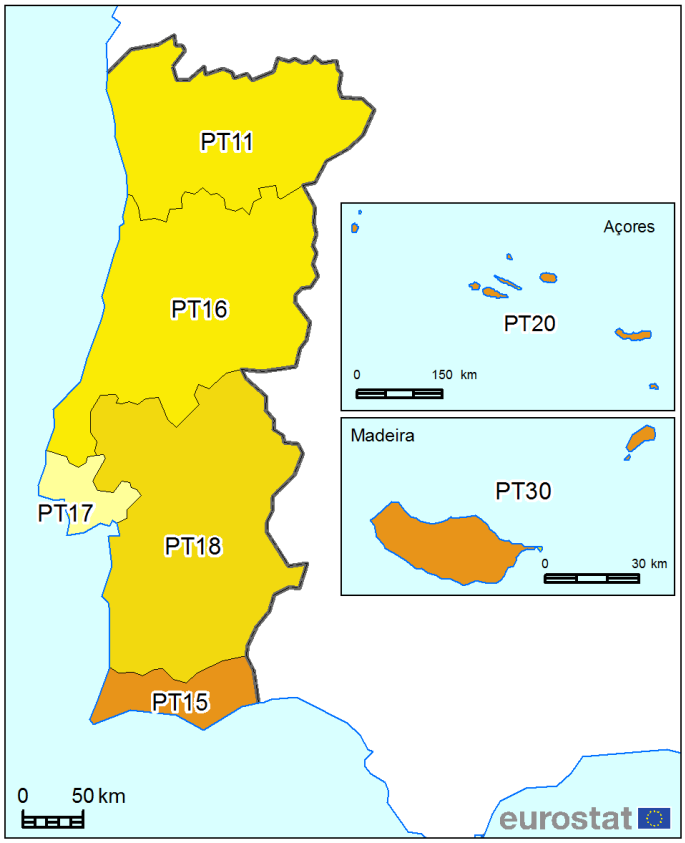
NUTS	Region	RII	Rank	Group	Change
PL	Poland	62.8	--	Emerging	13.3
PL21	Malopolskie	80.2	155	Moderate	19.3
PL22	Slaskie	57.7	206	Emerging +	11.6
PL41	Wielkopolskie	56.3	210	Emerging +	11.9
PL42	Zachodniopomorskie	50.7	218	Emerging	8.9
PL43	Lubuskie	46.1	224	Emerging	6.5
PL51	Dolnoslaskie	69.4	177	Emerging +	16.6
PL52	Opolskie	47.3	221	Emerging	10.7
PL61	Kujawsko-Pomorskie	55.6	213	Emerging +	12.5
PL62	Warminsko-Mazurskie	54.2	217	Emerging +	15.7
PL63	Pomorskie	66.8	187	Emerging +	13.2
PL71	Lódzkie	58.9	201	Emerging +	12.7
PL72	Swietokrzyskie	45.2	225	Emerging	10.2
PL81	Lubelskie	58.9	202	Emerging +	17.0
PL82	Podkarpackie	56.7	209	Emerging +	4.3
PL84	Podlaskie	58.3	204	Emerging +	19.0
PL91	Warszawski stoleczny	95.1	119	Moderate +	19.9
PL92	Mazowiecki regionalny	37.3	228	Emerging	4.1

Poland is an Emerging Innovator and includes 17 regions.

Warszawski stoleczny (PL91), the capital region, is the most innovative region, and a Moderate Innovator +. Malopolskie (PL21) is a Moderate Innovator. All other regions are Emerging Innovators.

Performance has increased for all regions, and most strongly in Warszawski stoleczny (PL91), Malopolskie (PL21) and Podlaskie (PL91). For 14 regions performance increased at a higher rate than that of the EU (8.5), for three regions performance increased at a lower rate.

Portugal



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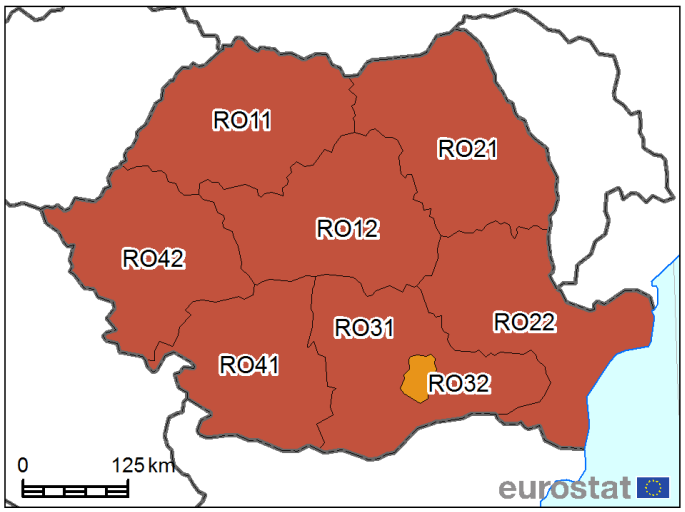
NUTS	Region	RII	Rank	Group	Change
PT	Portugal	85.6	--	Moderate	7.7
PT11	Norte	85.9	143	Moderate	6.2
PT15	Algarve	67.6	182	Emerging +	13.3
PT16	Centro	84.6	145	Moderate	4.2
PT17	Lisboa	99.8	107	Moderate +	14.4
PT18	Alentejo	70.1	175	Moderate -	7.5
PT2	Região Autónoma dos Açores	55.6	214	Emerging +	7.3
PT3	Região Autónoma da Madeira	61.6	194	Emerging +	11.8

Portugal is an Emerging Innovator and includes seven regions.

Four regions are Moderate Innovators, and three regions are Emerging Innovators. Lisboa (PT17), the capital region, is the most innovative region and a Moderate Innovator + with performance very close to that of the EU.

Performance has improved for all regions, and most strongly for Lisboa (PT17), Algarve (PT15) and Região Autónoma da Madeira (PT3). For three regions performance increased at a higher rate than that of the EU (8.5), for four regions performance increased at a lower rate.

Romania



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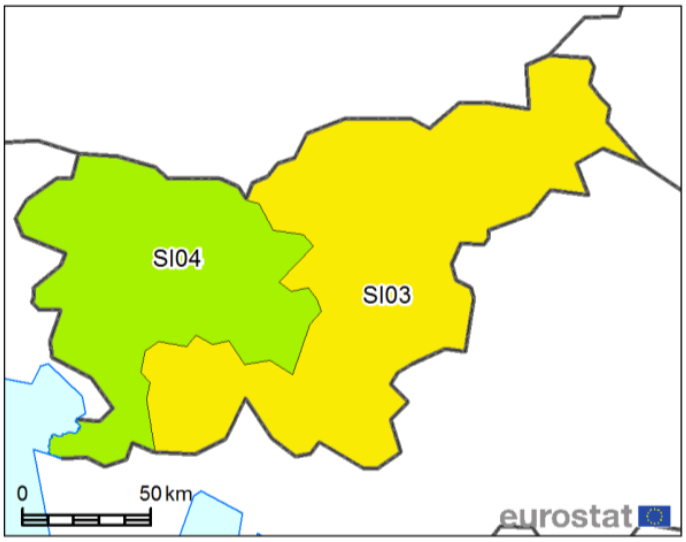
NUTS	Region	RII	Rank	Group	Change
RO	Romania	33.1	--	Emerging	1.4
RO11	Nord-Vest	34.5	232	Emerging -	4.0
RO12	Centru	25.7	236	Emerging -	1.3
RO21	Nord-Est	35.8	230	Emerging -	2.2
RO22	Sud-Est	18.9	239	Emerging -	-7.2
RO31	Sud - Muntenia	23.0	237	Emerging -	0.9
RO32	Bucuresti - Ilfov	59.5	199	Emerging +	1.9
RO41	Sud-Vest Oltenia	19.8	238	Emerging -	3.5
RO42	Vest	32.6	234	Emerging -	-0.9

Romania is an Emerging Innovator and includes eight regions.

All Romanian regions are Emerging Innovators. Regional performance differences are high in Romania with the best performing region, Bucuresti – Ilfov (RO32), performing more than three times as well as the lowest performing region, Sud-Est (RO22).

Performance has improved for six regions, most strongly for Nord-Vest (RO11) and Sud-Vest Oltenia (RO41), and declined for two regions, most strongly for Sud-Est (RO22). For all regions performance increased (or even decreased) at a lower rate than that of the EU (8.5).

Slovenia



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NUTS	Region	RII	Rank	Group	Change
SI	Slovenia	95.1	--	Moderate	2.9
SI03	Vzhodna Slovenija	84.9	144	Moderate	1.0
SI04	Zahodna Slovenija	105.4	85	Strong -	4.1

Slovenia is a Moderate Innovator and includes two regions.

Zahodna Slovenija (SI04) is the most innovative region and a Strong Innovator -. Vzhodna Slovenija (SI03) is a Moderate Innovator.

Performance has increased for both regions. For both regions performance also increased at a lower rate than that of the EU (8.5).

Slovakia

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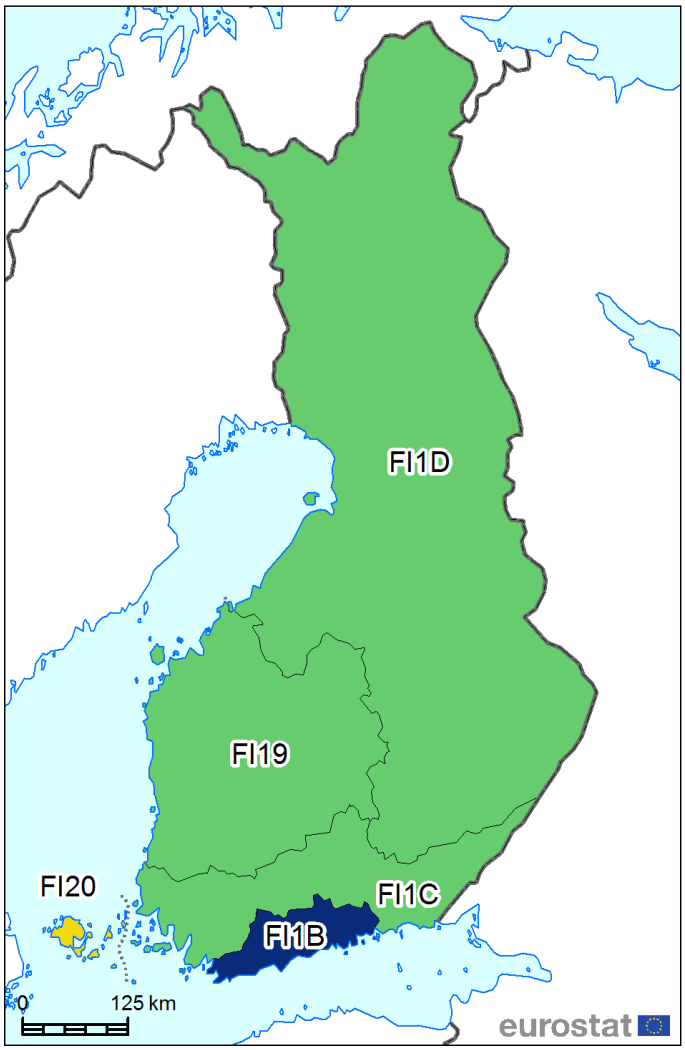
NUTS	Region	RII	Rank	Group	Change
SK	Slovakia	65.6	--	Emerging	6.4
SK01	Bratislavský kraj	91.3	130	Moderate +	1.9
SK02	Západné Slovensko	56.0	211	Emerging +	8.0
SK03	Stredné Slovensko	61.7	193	Emerging +	8.8
SK04	Východné Slovensko	62.1	192	Emerging +	4.4

Slovakia is an Emerging Innovator and includes four regions.

Bratislavský kraj (SK01), the capital region, is a Moderate Innovator +, the other three regions are Emerging Innovators +.

Performance has increased for all regions. Only for Stredné Slovensko (SK03) performance increased at a higher rate than that of the EU (8.5), for the other regions performance increased at a lower rate.

Finland



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NUTS	Region	RII	Rank	Group	Change
FI	Finland	134.3	--	Leader	18.3
FI1B	Helsinki-Uusimaa	152.1	2	Leader +	18.0
FI1C	Etelä-Suomi	121.5	48	Strong +	16.4
FI19	Länsi-Suomi	123.7	43	Strong +	14.4
FI1D	Pohjois- ja Itä-Suomi	122.0	46	Strong +	18.3
FI2	Åland	72.9	168	Moderate -	-0.5

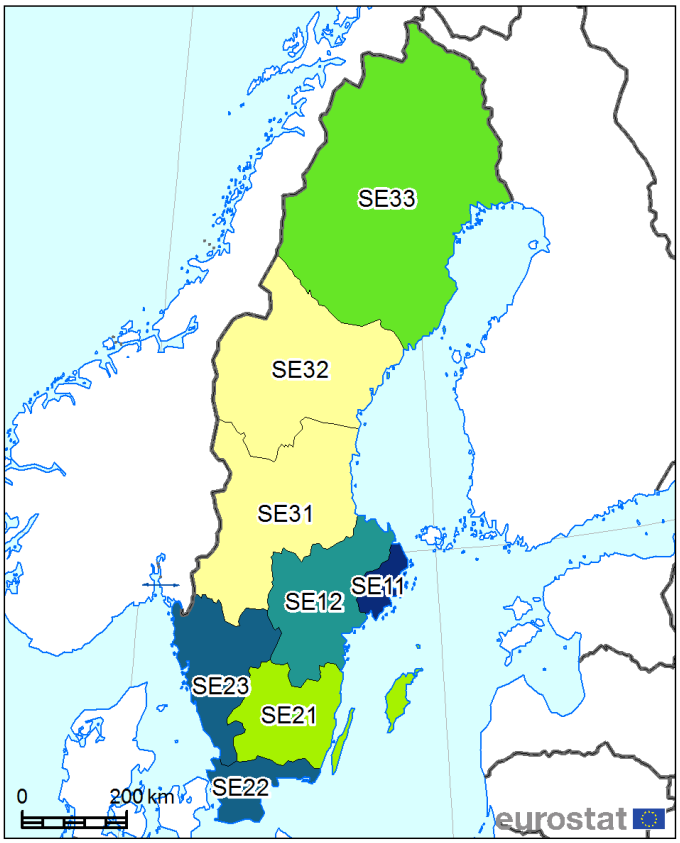
Finland is an Innovation Leader and includes five regions.

Only one region is an Innovation Leader: Helsinki-Uusimaa (FI1B), the overall second most innovative region in Europe. Three regions are a Strong Innovator + and one region is a Moderate Innovator -.

Performance has increased for four regions and decreased marginally for Åland (FI2). Performance change for all regions is at best equal to that of Finland, a result which seems counter-intuitive but that can be explained by the method used for calculating performance change.[5] Performance increase for four regions has been at a higher rate than that of the EU (8.5), only for Åland (FI2) performance increase has been at a lower rate.

[5] Performance change at the national level for Finland is above that of four regions within Finland and equal to that of Pohjois- ja Itä-Suomi (FI1D). This appears to be a counter-intuitive result but can be explained by the statistical method of calculating performance change by taking the difference between the relative to EU scores in 2016 and 2023, a method which does not fully account for differences in performance levels. Instead, if performance change between 2016 and 2023 would be measured against the own performance of the country and each of the regions in 2016, results would be more balanced with the growth rate of Finland not exceeding that of all of its regions. Using this method performance change would have been as follows: (regions and country ranked in descending order): Pohjois- ja Itä-Suomi (FI1D) 16.1%, Finland (FI) 14.4%, Länsi-Suomi (FI19) 14.3%, Etelä-Suomi (FI1C) 12.2%, Helsinki-Uusimaa (FI1B) 12.0%, and Åland (FI2) -0.6%.

Sweden



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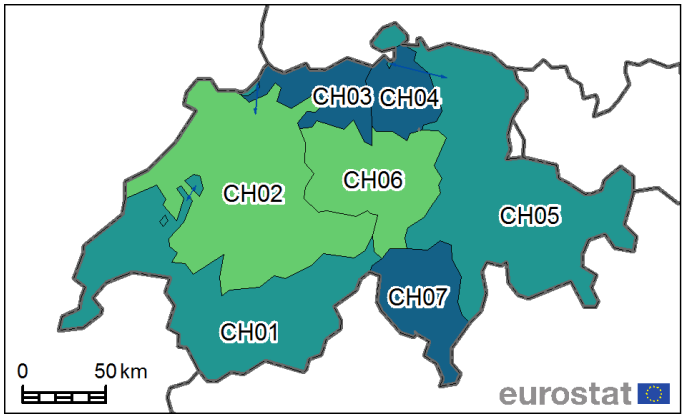
NUTS	Region	RII	Rank	Group	Change
SE	Sweden	134.5	--	Leader	10.4
SE11	Stockholm	149.8	4	Leader +	8.1
SE12	Östra Mellansverige	127.0	32	Leader -	7.9
SE21	Småland med öarna	103.5	91	Strong -	2.9
SE22	Sydsverige	136.0	14	Leader	7.0
SE23	Västsverige	138.5	10	Leader	14.9
SE31	Norra Mellansverige	91.4	129	Moderate +	3.6
SE32	Mellersta Norrland	93.7	122	Moderate +	-2.3
SE33	Övre Norrland	115.1	56	Strong	-1.0

Sweden is an Innovation Leader and includes eight regions.

Four regions are Innovation Leaders, two regions are Strong Innovators, and two regions are Moderate Innovators. Stockholm (SE11), the capital region, is the fourth most innovative region in Europe

Performance has increased for six regions, most strongly for Västsverige (SE23), and decreased for two regions. Only for Västsverige (SE23) performance increased at a higher rate than that of the EU (8.5), for the other regions performance increased (or even decreased) at a lower rate.

Switzerland



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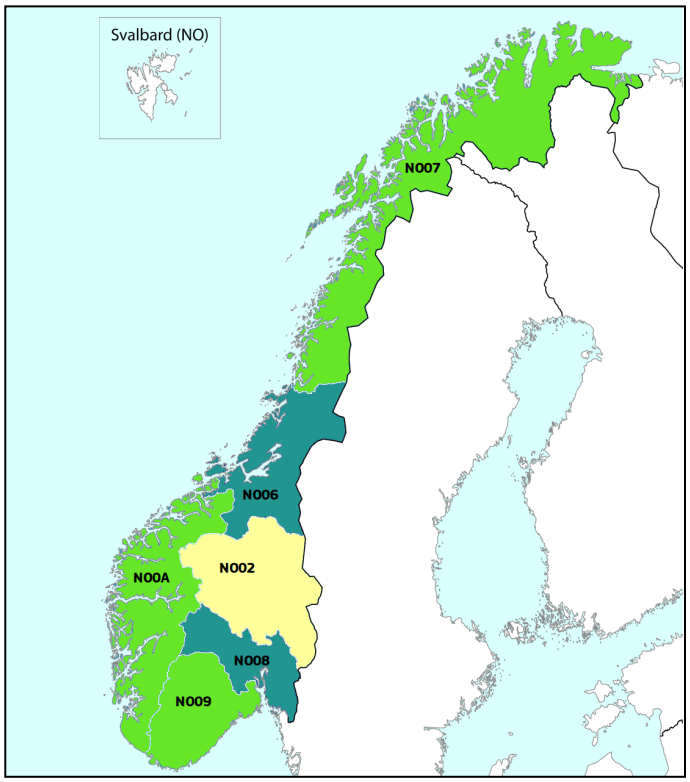
NUTS	Region	RII	Rank	Group	Change
CH	Switzerland	139.6	--	Leader	-0.6
CH01	Région lémanique	125.6	36	Leader -	-1.3
CH02	Espace Mittelland	122.9	45	Strong +	5.1
CH03	Nordwestschweiz	137.1	11	Leader	-3.8
CH04	Zürich	143.4	6	Leader	-6.9
CH05	Ostschweiz	130.9	18	Leader -	6.5
CH06	Zentralschweiz	123.0	44	Strong +	-2.3
CH07	Ticino	138.9	9	Leader	20.4

Switzerland is an Innovation Leader and includes seven regions.

Five regions are Innovation Leaders, and two regions are Strong Innovators. Zürich (CH04) is the most innovative Swiss region. Performance differences are relatively small with the best performing region only performing 1.2 times as well as the lowest performing region.

Performance has increased for three regions, most strongly for Ticino (CH07), and has decreased for four regions, resulting in a declining performance for Switzerland as a country. Only for Ticino (CH07) performance increased at a higher rate than that of the EU (8.5), for the other regions performance increased (or even decreased) at a lower rate.

Norway



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Cartography: Eurostat – IMAGE 06/2023.

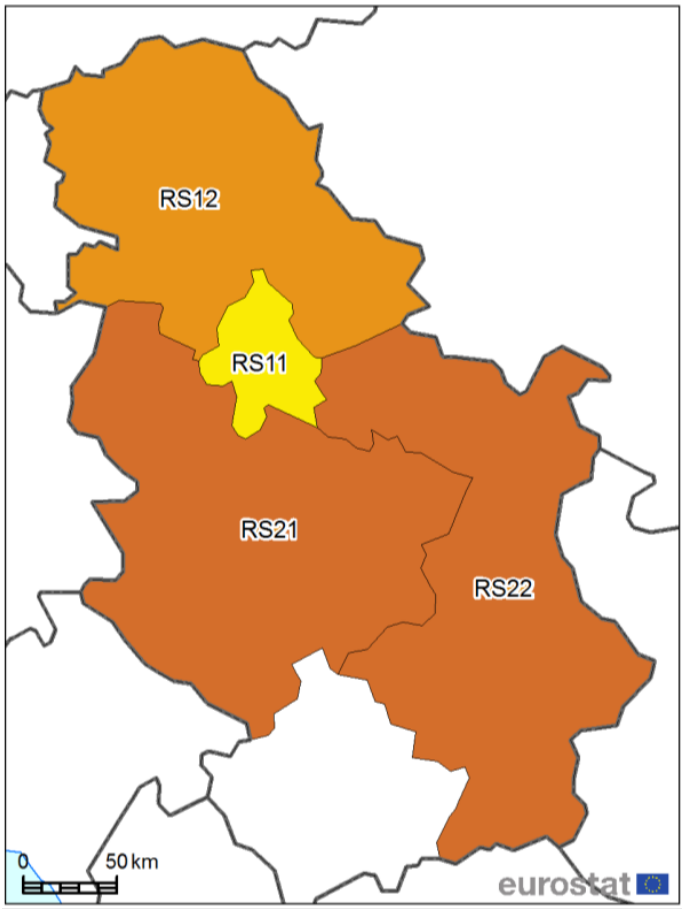
NUTS	Region	RII	Rank	Group	Change
N0	Norway	119.4	--	Strong	16.9
N002	Hedmark og Oppland	92.8	125	Moderate +	15.4
N006	Trøndelag	128.0	29	Leader -	2.4
N007	Nord-Norge	109.2	74	Strong	13.7
N008	Oslo og Viken	130.6	20	Leader -	15.7
N009	Agder og Sør-Østlandet	110.4	69	Strong	19.2
N00A	Vestlandet	113.4	61	Strong	15.4
N00B	Jan Mayen and Svalbard	N/A	N/A	N/A	N/A

Norway is a Strong Innovator and includes seven regions. There are no data for Jan Mayen and Svalbard (N00B).

Oslo og Viken (N008), the capital region, is the most innovative region and an Innovation Leader -. Trøndelag (N006) is also an Innovation Leader -. Three regions are Strong Innovators and Hedmark og Oppland (N002) is a Moderate Innovator.

Performance has increased for all regions, most strongly for Agder og Sør--Østlandet (N009). For five regions performance increased at a higher rate than that of the EU (8.5), only for Trøndelag (N006) performance increased at a lower rate.

Serbia



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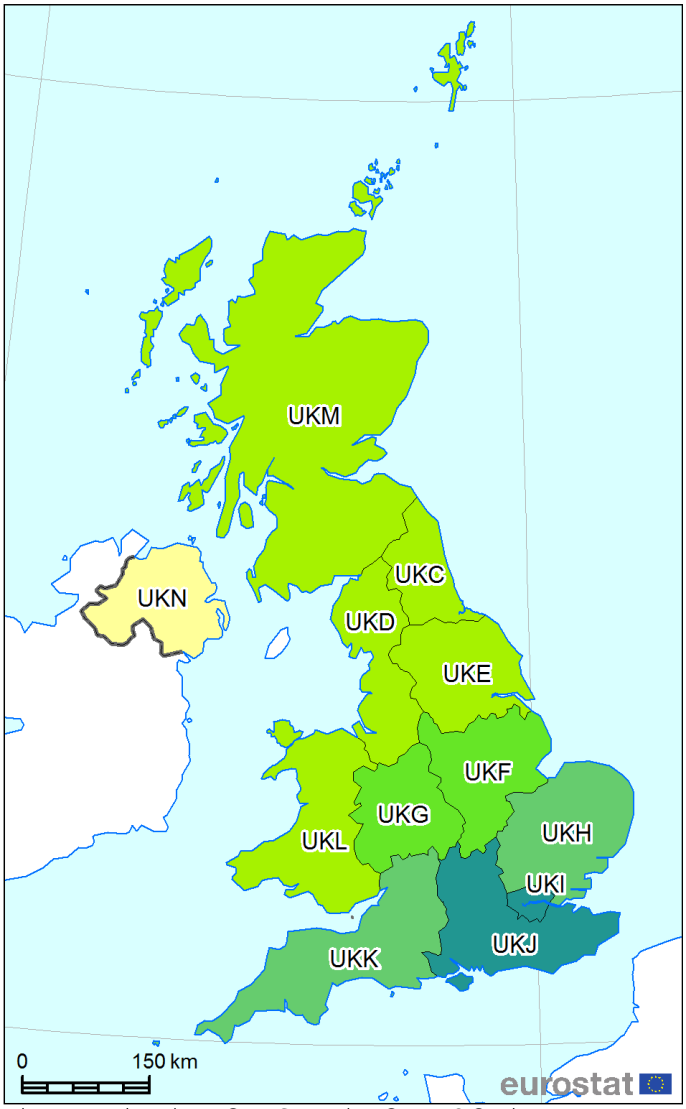
NUTS	Region	RII	Rank	Group	Change
RS	Serbia	63.2	--	Emerging	15.1
RS11	Belgrade	82.1	151	Moderate	23.2
RS12	Vojvodina	63.8	191	Emerging +	16.5
RS21	Šumadija and Western Serbia	48.7	220	Emerging	6.6
RS22	Southern and Eastern Serbia	49.6	219	Emerging	11.7

Serbia is an Emerging Innovator and includes four regions.

Belgrade (RS11) is the most innovative region and the only Moderate Innovator. The other regions are Emerging Innovators.

Performance has increased for all regions, most strongly for Belgrade (RS11). For three regions performance increased at a higher rate than that of the EU (8.5), only for Šumadija and Western Serbia (RS21) performance increased at a lower rate.

United Kingdom



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NUTS	Region	RII	Rank	Group	Change
UK	United Kingdom	113.9	--	Strong	2.7
UKC	North East	101.9	97	Strong -	-0.6
UKD	North West	104.9	89	Strong -	3.9
UKE	Yorkshire and The Humber	107.9	75	Strong -	5.6
UKF	East Midlands	112.9	62	Strong	6.6
UKG	West Midlands	112.5	64	Strong	6.8
UKH	East of England	121.2	50	Strong +	7.4
UKI	London	131.1	16	Leader -	5.5
UKJ	South East	130.3	22	Leader -	6.2
UKK	South West	117.7	54	Strong +	9.3
UKL	Wales	105.8	82	Strong -	10.9
UKM	Scotland	107.3	76	Strong -	5.8
UKN	Northern Ireland	94.8	120	Moderate +	8.6

The United Kingdom is a Strong Innovator and includes 12 regions.

Two regions are Innovation Leaders, and London (UKI), the capital region, is the most innovative region. Nine regions are Strong Innovators and Northern Ireland (UKN) is the only Moderate Innovator.

Performance has increased for 11 regions, most strongly for Wales (UKL), and decreased for one region, North East (UKC). For three regions performance increased at a higher rate than that of the EU (8.5), for nine regions performance increased (or even decreased) at a lower rate.

2.4 Performance changes over time

Performance of regional innovation systems changes over time. Over the last eight years, performance has increased for 211 regions, including all regions in Austria, Belgium, Croatia, Czechia, Denmark, Greece, Italy, Hungary, Lithuania, Netherlands, Norway, Poland, Portugal, Serbia, Slovakia, Slovenia, and Spain (**Table 8**). Performance has declined in 28 regions, including 12 regions in France, four in Germany and Switzerland, two in Romania and Sweden, and one in Bulgaria, Finland, Ireland, and the United Kingdom.

EU performance increased with 8.5%-points over the 8-year reference period (2016 to 2023). Compared to the EU, 126 regions improved their performance by more than 8.5%, whereas for 113 regions performance declined compared to that of the EU (**Table 9**). Relative to EU, performance increased for more than half of the Moderate Innovators and Emerging Innovators, and less than half of the Innovation Leaders and Strong Innovators.

Performance relative to the EU has increased for all regions in Belgium, Czechia, Greece, and Lithuania, and all but one region in Croatia, Denmark, Finland, Italy, Norway, and Serbia. Performance relative to the EU has decreased for all regions in Bulgaria, France, Ireland, Romania, and Slovenia, and all but one region in Austria, Slovakia, Sweden, and Switzerland. Relative performance changes over time are visualised in **Figure 2** using colour codes for eight different categories of performance change. Relative performance has increased in all green coloured regions, with darker shades of green showing higher degrees of relative performance increases. Relative performance has decreased in all blue coloured regions, with darker shades of blue showing higher levels of relative performance decreases.

Table 8: Performance change over time by regional performance group

	All regions	Innovation Leaders	Strong Innovators	Moderate Innovators	Emerging Innovators
Performance increase	**211 (88%)**	32 (89%)	61 (87%)	58 (84%)	60 (94%)
Performance decrease	**28 (12%)**	4 (11%)	9 (13%)	11 (16%)	4 (6%)
	239	**36**	**70**	**69**	**64**

Table 9: Performance change over time relative to EU by regional performance group

	All regions	Innovation Leaders	Strong Innovators	Moderate Innovators	Emerging Innovators
Performance increase relative to EU	**126 (53%)**	17 (47%)	33 (47%)	43 (62%)	33 (52%)
Performance decrease relative to EU	**113 (47%)**	19 (53%)	37 (53%)	26 (38%)	31 (48%)
	239	**36**	**70**	**69**	**64**

Performance increases over time are driven more by some indicators than by others. **Table 10** summarizes for each indicator the average increase across all regions compared to their own performance in 2016, and also shows the percentage shares of all regions for which performance increased or decreased. Overall performance changes have been driven most by those indicators for which average performance has increased strongest (by 50% or more, in descending order): Air emissions in fine particulates (PM2.5) in Industry, International scientific co-publications, SMEs with business process innovations, Most-cited scientific publications, SMEs with product innovations, and Sales of new-to-market and new-to-enterprise innovations. Only for No-R&D innovation expenditures average performance has decreased over time.

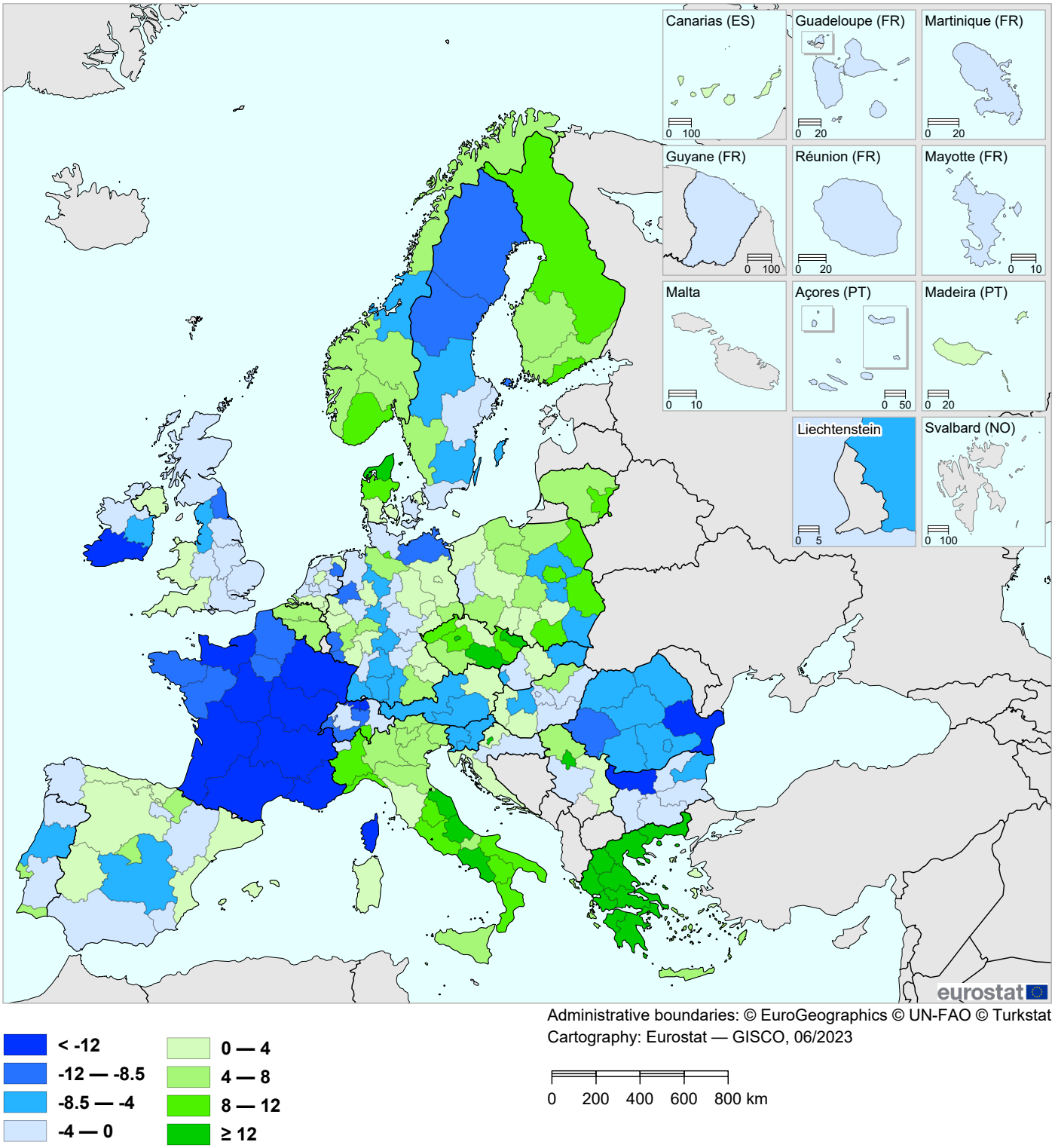
These average percentage shares however do not differentiate between regions starting from low scores from those starting from already high scores. For example, a region for which R&D expenditures in the business sector increase from 1.00% of GDP to 1.02% of GDP experiences a percentage increase of 2%, whereas a region for which R&D expenditures in the business sector increase from 0.02% of GDP to 0.04% of GDP experiences a percentage increase of 100%. The unweighted average increase would be 51%, whereas, if both regions would be combined into one and assuming that both regions have the same GDP, the weighted average increase would be less than 4%.

It is therefore useful to include additional information on the shares of regions for which performance increased or decreased. Performance increased for more than 90% of the regions for International scientific co-publications, Employed ICT specialists, Public-private scientific co-publications, and Air emissions in fine particulates (PM2.5) in Industry. Performance increased between 70% and 90% of the regions for SMEs with product innovations, SMEs with business process innovations, Innovative SMEs collaborating with others, Trademark applications, and Sales of new-to-market and new-to-enterprise innovations. Indicators for which performance has increased for a relatively small number of regions include Population aged 25-34 having completed tertiary education, Population aged 25-64 participating in lifelong learning, and Employment in knowledge-intensive activities. For the first two indicators this is the result of not having time series data due recent breaks in series. Although the empirical evidence is mixed, results suggest that innovation performance has increased most due to increasing performance in those indicators measuring scientific activities, innovation activities in the business sector, and environmental sustainability.

Table 10: Average indicator scores by regional performance group

	Average change in performance relative to own performance since 2016	Percentage-share of regions for which performance increased	Percentage-share of regions for which performance decreased
Percentage of population aged 25-34 having completed tertiary education	6%	5%	1%
Percentage of population aged 25-64 participating in lifelong learning	3%	1%	5%
International scientific co-publications per million population	75%	97%	0%
Scientific publications among the top-10% most cited publications worldwide as percentage of total scientific publications of the country	69%	47%	53%
Individuals who have above basic overall digital skills	1%	37%	41%
R&D expenditures in the public sector as percentage of GDP	5%	57%	29%
R&D expenditure in the business sector as percentage of GDP	25%	69%	15%
Non-R&D innovation expenditures as percentage of total turnover	-4%	39%	56%
Innovation expenditures per person employed	10%	66%	34%
Employed ICT specialists as percentage of total employment	53%	96%	0%
SMEs introducing product innovations as percentage of SMEs	68%	74%	26%
SMEs introducing business process innovations as percentage of SMEs	69%	83%	17%
Innovative SMEs collaborating with others as percentage of SMEs	45%	79%	20%
Public-private co-publications per million population	33%	95%	2%
PCT patent applications per billion GDP (in Purchasing Power standards)	6%	25%	71%
Trademark applications per billion GDP (in Purchasing Power standards)	46%	82%	17%
Individual design applications per billion GDP (in Purchasing Power standards)	17%	37%	62%
Employment in knowledge-intensive activities as percentage of total employment	6%	5%	1%
Employment in innovative enterprises as percentage of total employment	45%	60%	40%
Sales of new-to-market and new-to-enterprise innovations as percentage of total turnover	63%	71%	29%
Air emissions in fine particulates (PM2.5) in Industry	225%	96%	4%

Figure 2: Innovation performance change 2016-2023



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

3. Performance per indicator

This chapter discusses the spread in regions' innovation performance for each of the indicators. It also presents for each of the 21 indicators a map visualising the performance of 12 performance sub-groups, a discussion of differences in performance spread within countries, and the top-40 best performing regions.

Cyprus, Estonia, Latvia, Luxembourg and Malta, are excluded from the analysis, tables, and maps in this chapter as these countries are covered in the EIS 2023.

The distribution of relative performance scores varies strongly across the individual indicators. The reason for this is that individual indicators have a more skewed distribution compared to that for the RII. Most relative to EU scores per indicator are not symmetrically distributed. For instance, there are substantially more regions performing above 125% of the EU average on International scientific co-publications and Public-private co-publications (**Table 11**). For both indicators this can be explained by the fact that the EU aggregate is less than the sum of publications for each of the individual 27 Member States. For example, if for a scientific publication there are two co-authors from two different EU Member States and one co-author from a non-EU country, this publication counts as an international scientific co-publication for both Member States but only as one international scientific co-publication for the EU.

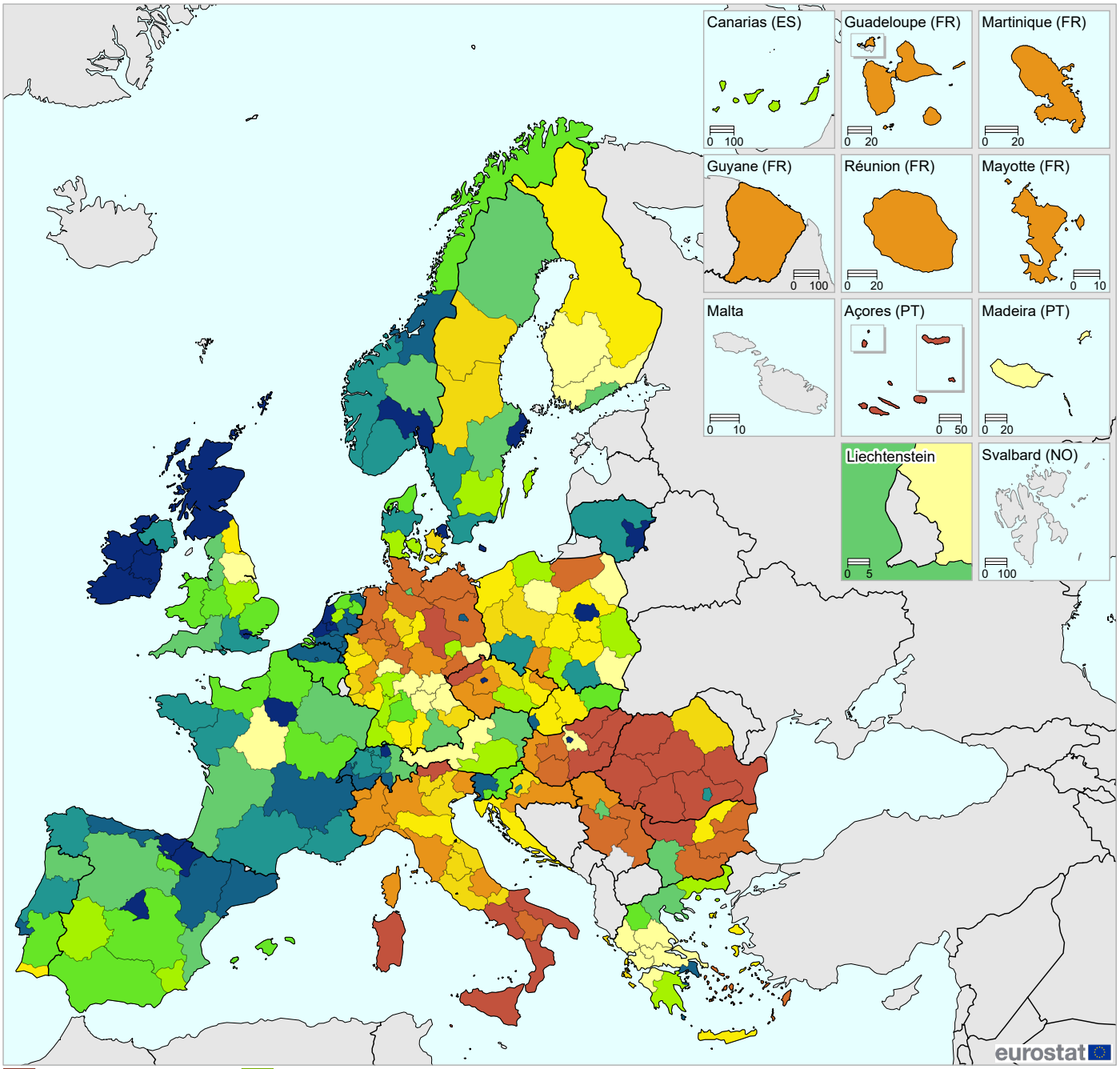
By contrast, more than 100 regions perform below 70% of the EU average on R&D expenditure in the business sector, PCT patent applications, Trademark applications, and Design applications. For these four indicators these results show that the distribution of the indicator values is highly skewed with only a small number of regions having high indicator values and the majority of regions having low indicator values. The regions with high indicator values also contribute strongly to the EU average thereby raising the EU average to a relatively high value causing many regions to perform well below the EU average. E.g. for PCT patent applications, the regions performing above 125% of the EU average, account for more than 75% of the volume of patent applications but less than 40% of GDP.

On the following pages, for each of the indicators used in the RIS 2023, regional performance is shown in a geographical map. To ensure sufficient variation in the maps for performance per indicator, regions are classified into 12 performance groups of equal size with the best subset of regions classified as Top high performers, the next best subset of regions as Middle high performers, and so on until the last subset regions which are classified as Bottom low performers. For each indicator, two tables are included. The first table shows the variation in performance between regions in each country and the second table the 40 best performing regions in Europe.

Table 11: Number of regions in different performance groups per indicator

	Performance above 125% of EU	Performance between 100% and 125% of EU	Performance between 70% and 100% of EU	Performance below 70% of EU
Regional innovation index	36	70	69	64
Percentage of population aged 25-34 having completed tertiary education	63	36	59	80
Percentage of population aged 25-64 participating in lifelong learning	76	30	39	94
International scientific co-publications per million population	100	25	27	87
Scientific publications among the top-10% most cited publications worldwide as percentage of total scientific publications of the country	53	59	58	68
Individuals who have above basic overall digital skills	81	24	72	61
R&D expenditures in the public sector as percentage of GDP	29	46	83	81
R&D expenditure in the business sector as percentage of GDP	23	38	70	108
Non-R&D innovation expenditures as percentage of total turnover	42	58	80	52
Innovation expenditures per person employed	25	55	79	73
Employed ICT specialists as percentage of total employment	40	25	52	90
SMEs introducing product innovations as percentage of SMEs	69	62	46	62
SMEs introducing business process innovations as percentage of SMEs	60	76	33	70
Innovative SMEs collaborating with others as percentage of SMEs	76	44	46	73
Public-private co-publications per million population	132	31	45	31
PCT patent applications per billion GDP (in Purchasing Power standards)	41	26	52	120
Trademark applications per billion GDP (in Purchasing Power standards)	38	32	57	112
Individual design applications per billion GDP (in Purchasing Power standards)	34	37	59	109
Employment in knowledge-intensive activities as percentage of total employment	55	34	59	90
Employment in innovative enterprises as percentage of total employment	62	84	27	66
Sales of new-to-market and new-to-enterprise innovations as percentage of total turnover	67	31	59	82
Air emissions in fine particulates (PM2.5) in Industry	50	89	46	38

Percentage population aged 25-34 having completed tertiary education



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Percentage population aged 25-34 having completed tertiary education

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Half of the regions sharing first place comprise of capital city regions, including Sostines regionas (LT01) in Lithuania, *London* (UKI) in the United Kingdom, *Île de France* (FR1) in France, *Warszawski stoleczny* (PL91) in Poland, and *Hovedstaden* (DK01) in Denmark. Other regions sharing first place include *País Vasco* (ES21) in Spain, *Utrecht* (NL31) in the Netherlands, *Zürich* (CH04) in Switzerland, and *Eastern and Midland* (IE06) in Ireland.

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 1.9 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Czechia, Hungary, and Romania, where this ratio is above 3.

In total 97 regions perform above the EU average and 141 regions perform below the EU average. In Belgium, Ireland, Lithuania, Norway, Slovenia, and Switzerland, all regions perform above the EU average. In Italy, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	1.9	97	141				
BE	1.3	3	0	NL	1.6	10	2
BG	2.2	1	5	AT	1.2	1	2
CZ	3.2	1	7	PL	2.3	3	14
DK	2.0	3	2	PT	2.2	4	3
DE	2.2	4	34	RO	3.3	1	7
IE	1.1	3	0	SI	1.2	2	0
EL	1.9	2	11	SK	1.6	2	2
ES	2.5	15	4	FI	1.3	1	3
FR	2.2	10	4	SE	1.9	5	3
HR	1.7	1	3	NO	1.4	6	0
IT	1.7	0	21	CH	1.4	7	0
LT	1.5	2	0	RS	1.7	1	3
HU	3.2	1	7	UK	1.9	8	4

Definition of the indicator

Numerator: Number of persons in age class with some form of post-secondary education

Denominator: The reference population is all age classes between 25 and 34 years inclusive

Rationale: This is a general indicator of the supply of advanced skills. It is not limited to science and technical fields, because the adoption of innovations in many areas, including the service sectors, depends on a wide range of skills

Missing data: Åland (FI2)

Top 40 regions

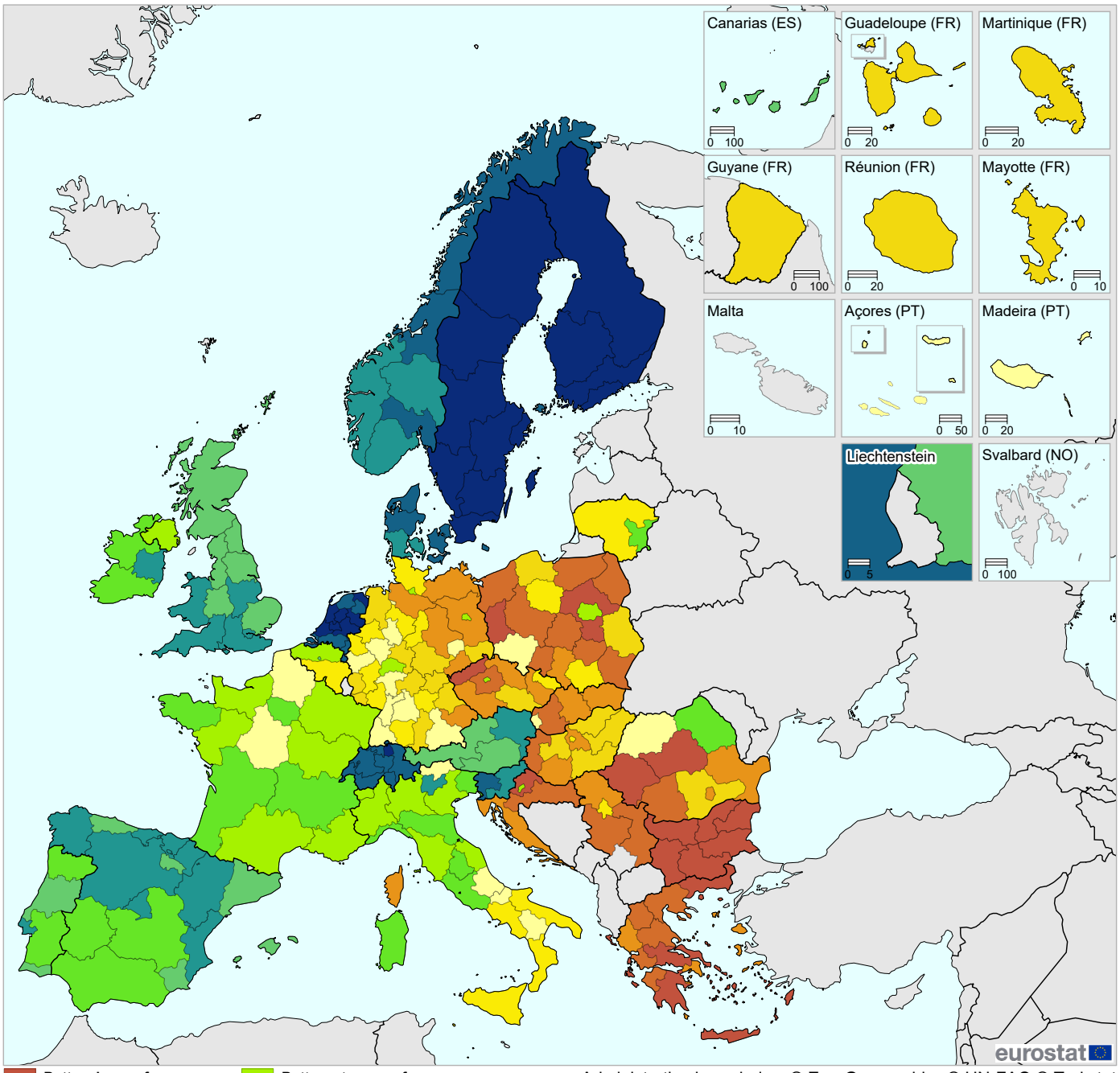
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	41.2
1	Sostines regionas (LT01)	190.3	73.4
2	London (UKI)	190.3	67.9
3	País Vasco (ES21)	190.3	66.0
4	Utrecht (NL31)	190.3	65.5
5	Île de France (FR1)	190.3	64.9
6	Warszawski stoleczny (PL91)	190.3	64.9
7	Zürich (CH04)	190.3	64.8
8	Eastern and Midland (IE06)	190.3	63.6
9	Hovedstaden (DK01)	190.3	63.2
10	Comunidad Foral de Navarra (ES22)	186.5	61.7
11	Oslo og Viken (NO08)	184.8	61.3
12	Budapest (HU11)	184.0	61.1
13	Noord-Holland (NL32)	184.0	61.1
14	Southern (IE05)	179.7	60.1
15	Stockholm (SE11)	179.7	60.1
16	Praha (CZ01)	178.9	59.9
17	Northern and Western (IE04)	171.7	58.2
18	Zuid-Holland (NL33)	170.9	58.0
19	Scotland (UKM)	167.9	57.3
20	Comunidad de Madrid (ES3)	166.7	57.0
21	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	165.4	56.7
22	Bratislavský kraj (SK01)	157.0	54.7
23	Principado de Asturias (ES12)	156.1	54.5
24	Ticino (CH07)	154.9	54.2
25	Trøndelag (NO06)	154.9	54.2
26	Cataluña (ES51)	154.0	54.0
27	Noord-Brabant (NL41)	154.0	54.0
28	Groningen (NL11)	153.6	53.9
29	Lisboa (PT17)	153.2	53.8
30	Limburg (NL42)	151.9	53.5
31	Vlaams Gewest (BE2)	151.9	53.5
32	Gelderland (NL22)	151.1	53.3
33	Auvergne - Rhône-Alpes (FRK)	149.4	52.9
34	Attiki (EL3)	148.1	52.6
35	Cantabria (ES13)	146.8	52.3
36	Aragón (ES24)	146.0	52.1
37	Overijssel (NL21)	146.0	52.1
38	Région lémanique (CH01)	145.1	51.9
39	Zahodna Slovenija (SI04)	144.3	51.7
40	Berlin (DE3)	141.8	51.1

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Percentage population aged 25-64 participating in lifelong learning



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Percentage population aged 25-64 participating in lifelong learning

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Half of the regions sharing first place are in Sweden including top performing regions *Stockholm* (SE11), *Östra Mellansverige* (SE12) and *Sydsverige* (SE22). Four regions in both Finland and the Netherlands also share first place.

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 2.3 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Croatia, Czechia, Greece, Poland and Romania, where this ratio is above 3.

In total 104 regions perform above the EU average and 135 regions perform below the EU average. In Austria, Denmark, Finland, Ireland, the Netherlands, Norway, Slovenia, Spain, Sweden, and Switzerland, all regions perform above the EU average. In Bulgaria, Czechia, Greece, Hungary, Poland, Serbia, and Slovakia, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	2.3	104	135				
BE	1.9	1	2	NL	1.3	12	0
BG	2.7	0	6	AT	1.2	3	0
CZ	3.8	0	8	PL	4.2	0	17
DK	1.3	5	0	PT	1.8	5	2
DE	2.1	1	37	RO	7.7	1	7
IE	1.3	3	0	SI	1.2	2	0
EL	3.5	0	13	SK	2.7	0	4
ES	1.4	19	0	FI	1.4	5	0
FR	3.0	4	10	SE	1.2	8	0
HR	3.9	1	3	NO	1.1	6	0
IT	2.1	8	13	CH	1.3	7	0
LT	1.6	1	1	RS	2.4	0	4
HU	2.0	0	8	UK	1.6	12	0

Definition of the indicator

Numerator: Number of persons in private households aged between 25 and 64 years who have participated in the four weeks preceding the interview, in any education or training, whether or not relevant to the respondent's current or possible future job

Denominator: Total population aged between 25 and 64 years

Rationale: Lifelong learning encompasses all purposeful learning activity, whether formal, non-formal or informal, undertaken on an ongoing basis with the aim of improving knowledge, skills and competence. The intention or aim to learn is the critical point that distinguishes these activities from non-learning activities, such as cultural or sporting activities

Missing data: none

Top 40 regions

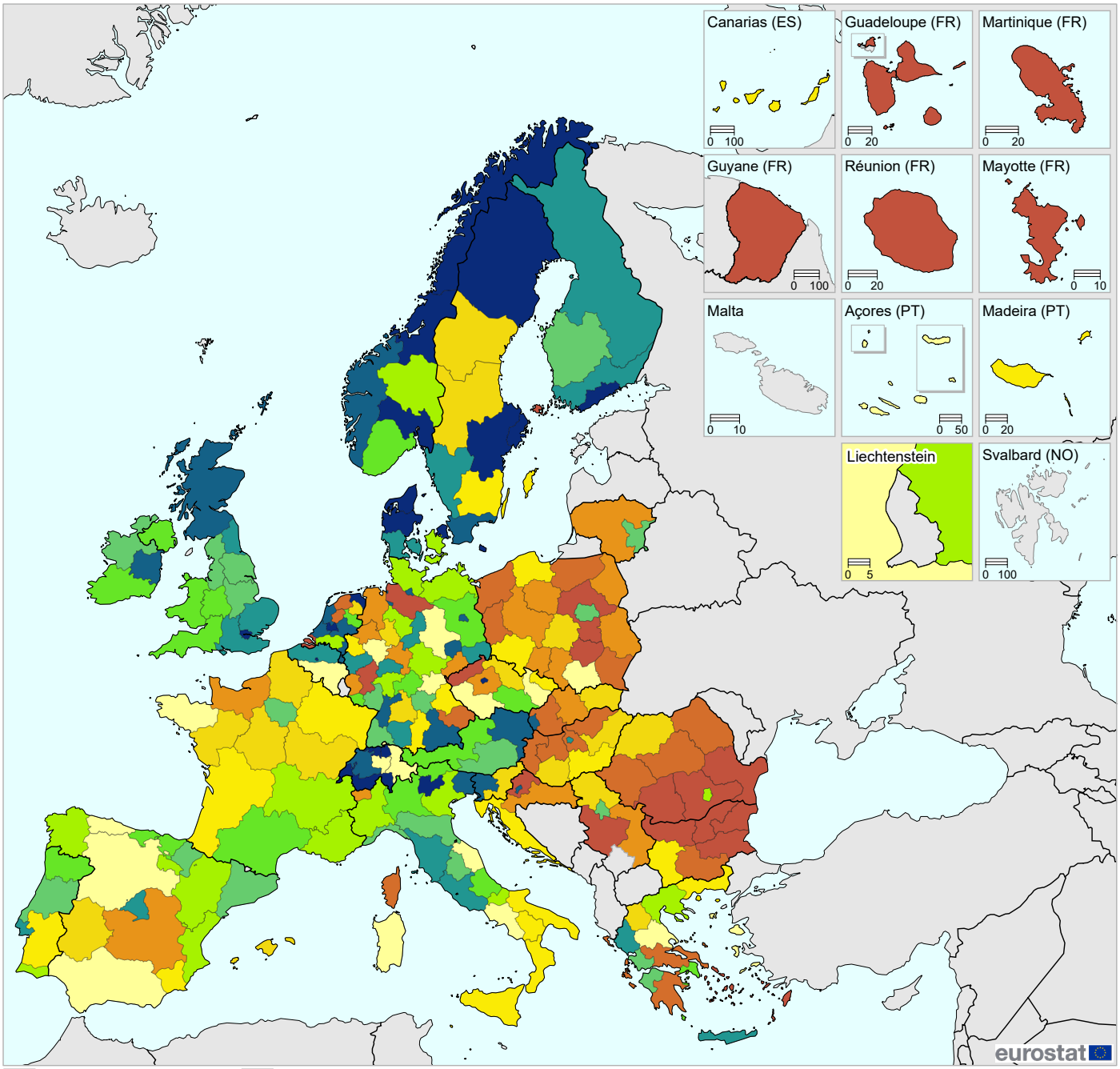
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	10.8
1	Stockholm (SE11)	269.4	36.5
2	Helsinki-Uusimaa (FI1B)	269.4	35.1
3	Östra Mellansverige (SE12)	269.4	35.1
4	Sydsverige (SE22)	269.4	35.1
5	Västsverige (SE23)	269.4	34.6
6	Norra Mellansverige (SE31)	269.4	33.6
7	Småland med öarna (SE21)	269.4	32.6
8	Mellersta Norrland (SE32)	269.4	31.2
9	Övre Norrland (SE33)	269.4	30.7
10	Utrecht (NL31)	269.4	29.4
11	Groningen (NL11)	269.4	28.9
12	Länsi-Suomi (FI19)	269.4	28.8
13	Pohjois- ja Itä-Suomi (FI1D)	269.4	28.5
14	Noord-Holland (NL32)	269.4	28.3
15	Etelä-Suomi (FI1C)	269.4	27.6
16	Zuid-Holland (NL33)	269.4	27.4
17	Overijssel (NL21)	262.2	26.7
18	Flevoland (NL23)	257.1	26.2
19	Gelderland (NL22)	256.1	26.1
20	Zürich (CH04)	256.1	26.1
21	Hovedstaden (DK01)	254.1	25.9
22	Zeeland (NL34)	245.9	25.1
23	Noord-Brabant (NL41)	243.9	24.9
24	Åland (FI2)	239.8	24.5
25	Drenthe (NL13)	239.8	24.5
26	Friesland (NL12)	226.5	23.2
27	Nordwestschweiz (CH03)	224.5	23.0
28	Limburg (NL42)	220.4	22.6
29	Région lémanique (CH01)	218.4	22.4
30	Zentralschweiz (CH06)	215.3	22.1
31	Espace Mittelland (CH02)	214.3	22.0
32	Midtjylland (DK04)	214.3	22.0
33	Ticino (CH07)	207.1	21.3
34	Trøndelag (NO06)	203.1	20.9
35	Zahodna Slovenija (SI04)	200.0	20.6
36	Ostschweiz (CH05)	199.0	20.5
37	Sjælland (DK02)	198.0	20.4
38	Oslo og Viken (NO08)	193.9	20.0
39	Nordjylland (DK05)	192.9	19.9
40	Nord-Norge (NO07)	190.8	19.7

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

International scientific co-publications per million population



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

International scientific co-publications per million population

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. The regions sharing first place are scattered through Europe including regions in nine countries. Based on the indicator value, best performing regions are *Zürich* (CH04), *Groningen* (NL11), and *Trøndelag* (NO06), all with more than 8,000 international scientific co-publications per million population.

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 12.3 times higher than the worst performing region. This is due to the presence of research institutes in specific regions within countries. In several countries the ratio is much higher, particularly in Czechia, Finland, the Netherlands, and Poland, where this ratio is above 30.

In total 122 regions perform above the EU average and 114 regions perform below the EU average. In Austria, Belgium, Denmark, Ireland, Norway and the United Kingdom, all regions perform above the EU average. In Bulgaria all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	12.3	122	114				
BE	4.3	3	0	NL	44.4	8	4
BG	14.7	0	6	AT	1.9	3	0
CZ	32.1	2	6	PL	33.0	1	16
DK	4.3	5	0	PT	2.6	4	3
DE	16.1	22	16	RO	13.0	1	7
IE	1.7	3	0	SI	5.1	1	1
EL	14.9	6	7	SK	6.8	1	3
ES	9.7	9	10	FI	35.9	4	1
FR	10.0	4	10	SE	7.6	5	3
HR	16.1	1	3	NO	5.3	3	0
IT	8.4	15	6	CH	7.5	6	1
LT	3.5	1	1	RS	7.5	1	3
HU	10.3	1	7	UK	2.7	12	0

Definition of the indicator

Numerator: Number of scientific publications with at least one co-author based abroad

Denominator: Total population

Rationale: International scientific co-publications are a proxy for the quality of scientific research as collaboration increases scientific productivity

Missing data: none

Top 40 regions

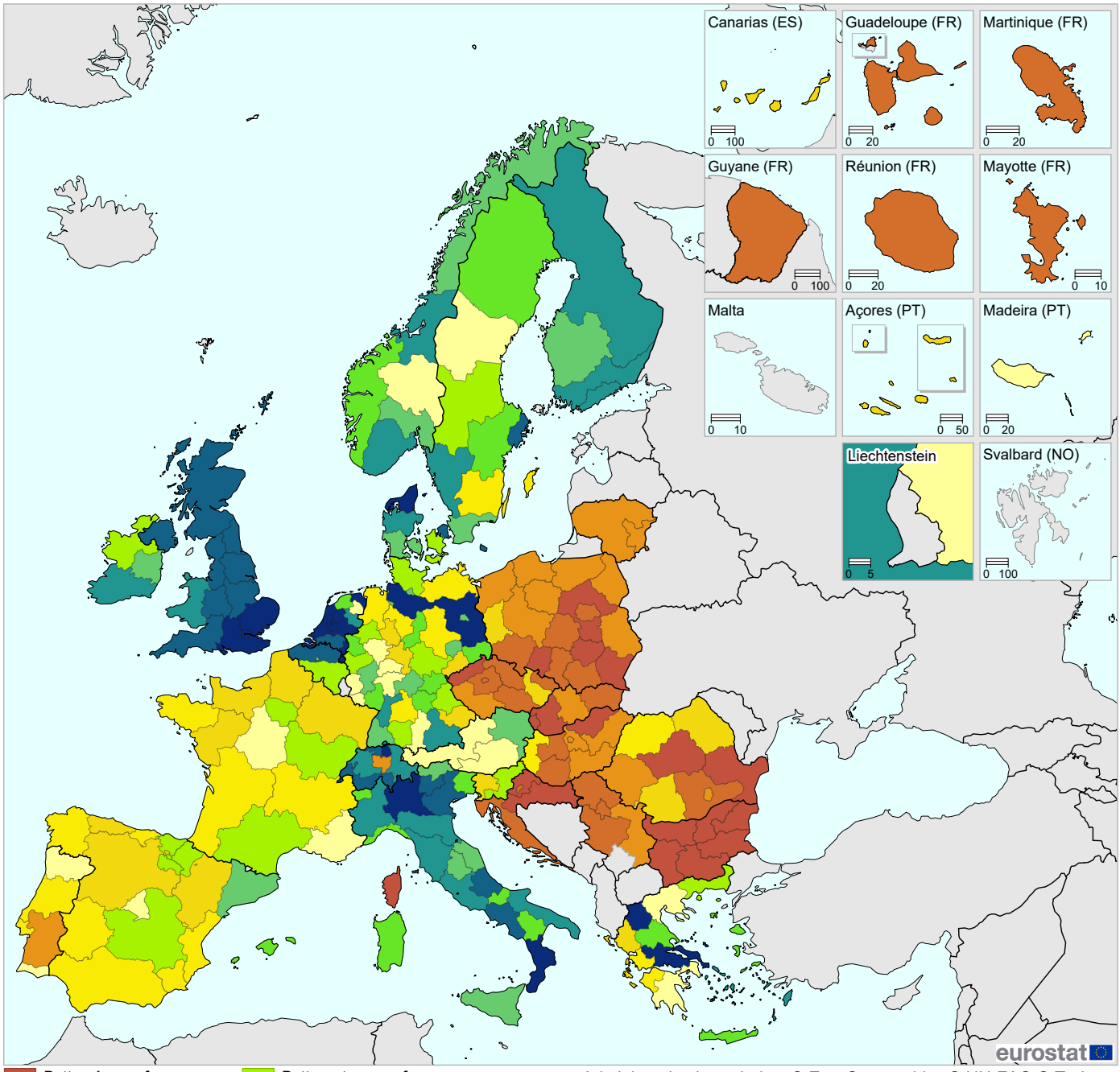
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	1272.8
1	Zürich (CH04)	326.1	8405.0
2	Groningen (NL11)	326.1	8387.4
3	Trøndelag (NO06)	326.1	8291.0
4	Région lémanique (CH01)	326.1	7763.3
5	Hovedstaden (DK01)	326.1	6167.7
6	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	326.1	5547.5
7	Praha (CZ01)	326.1	5540.2
8	Nordwestschweiz (CH03)	326.1	5371.1
9	Övre Norrland (SE33)	326.1	5136.8
10	Stockholm (SE11)	326.1	5073.4
11	Utrecht (NL31)	326.1	4966.2
12	Helsinki-Uusimaa (FI1B)	326.1	4731.9
13	Östra Mellansverige (SE12)	326.1	4582.6
14	Midtjylland (DK04)	326.1	4484.1
15	London (UKI)	326.1	4404.0
16	Nordjylland (DK05)	326.1	4282.3
17	Oslo og Viken (NO08)	326.1	4222.3
18	Nord-Norge (NO07)	326.1	4179.1
19	Provincia Autonoma Trento (ITH2)	306.9	3887.5
20	Ticino (CH07)	304.8	3861.7
21	Grad Zagreb (HR05)	298.7	3784.4
22	Noord-Holland (NL32)	297.1	3763.8
23	Gelderland (NL22)	283.4	3590.2
24	Limburg (NL42)	282.9	3584.0
25	Zuid-Holland (NL33)	282.2	3574.9
26	Sydsverige (SE22)	274.4	3477.1
27	Zahodna Slovenija (SI04)	271.4	3439.3
28	Karlsruhe (DE12)	270.6	3428.6
29	Leipzig (DED5)	266.0	3370.8
30	Berlin (DE3)	263.9	3343.9
31	Espace Mittelland (CH02)	263.4	3338.4
32	Hamburg (DE6)	257.5	3263.9
33	Vestlandet (NO0A)	252.6	3201.9
34	Bremen (DE5)	248.7	3151.7
35	Ostösterreich (AT1)	242.8	3077.7
36	Scotland (UKM)	242.8	3077.3
37	Oberbayern (DE21)	240.0	3042.3
38	Eastern and Midland (IE06)	239.2	3031.6
39	Friuli-Venezia Giulia (ITH4)	237.3	3008.4
40	Bratislavský kraj (SK01)	234.7	2974.9

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Scientific publications among the top-10% most cited publications worldwide as percentage of total scientific publications of the region



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Scientific publications among the top-10% most cited publications worldwide as percentage of total scientific publications of the region

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. The top-40 best performing regions are scattered through Europe across 10 countries. *Ciudad de Ceuta* (ES63) is, based on its indicator value, the best performing region followed by *Flevoland* (NL23), and *Lüneburg* (DE93).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 2.0 times higher than the worst performing region. In several countries the ratio is much higher, particularly in Bulgaria, Poland and Spain, where this ratio is above 3.

In total 109 regions perform above the EU average and 126 regions perform below the EU average. In Belgium, Denmark, Finland, Italy, Ireland, and the United Kingdom, all regions perform above the EU average. In Bulgaria, Croatia, Czechia, Hungary, Lithuania, Poland, Portugal, Romania, Serbia, Slovakia, and Slovenia, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	2.0	109	126				
BE	1.3	3	0	NL	1.9	11	1
BG	5.0	0	6	AT	1.2	1	2
CZ	2.9	0	8	PL	3.9	0	17
DK	1.4	5	0	PT	1.6	0	7
DE	2.4	21	17	RO	2.2	0	8
IE	1.2	3	0	SI	1.3	0	2
EL	2.3	6	6	SK	1.6	0	4
ES	3.3	7	12	FI	1.1	4	0
FR	2.5	1	13	SE	1.4	6	2
HR	1.2	0	4	NO	1.2	2	1
IT	1.4	21	0	CH	2.4	6	1
LT	1.0	0	2	RS	1.1	0	4
HU	2.9	0	8	UK	1.3	12	0

Definition of the indicator

Numerator: Number of scientific publications among the top 10 % most cited publication worldwide

Denominator: Total number of scientific publications

Rationale: The indicator is a measure for the efficiency of the research system as highly cited publications are assumed to be of higher quality. There could be a bias towards small or English-speaking countries given the coverage of Scopus' publication data

Missing data: Åland (FI2)

Top 40 regions

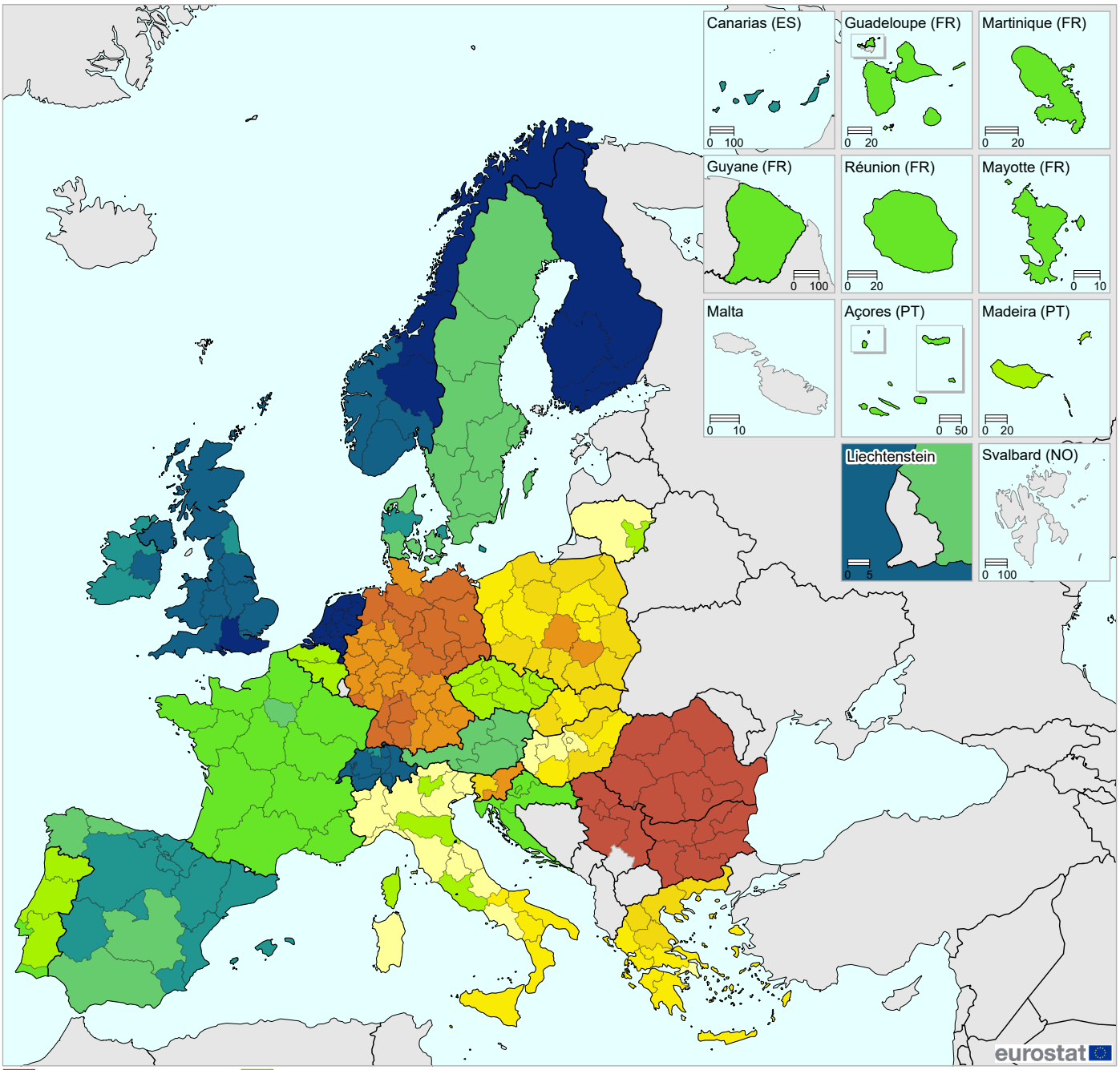
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	9.82
1	Ciudad de Ceuta (ES63)	183.0	23.07
2	Flevoland (NL23)	183.0	17.97
3	Lüneburg (DE93)	183.0	17.03
4	East of England (UKH)	173.3	15.86
5	Zürich (CH04)	171.8	15.73
6	London (UKI)	162.4	14.96
7	Dytiki Makedonia (EL53)	161.3	14.87
8	Nordjylland (DK05)	159.7	14.74
9	Gelderland (NL22)	159.2	14.70
10	Noord-Holland (NL32)	159.0	14.69
11	Calabria (ITF6)	158.9	14.68
12	Utrecht (NL31)	158.8	14.67
13	Zeeland (NL34)	157.7	14.58
14	Groningen (NL11)	156.7	14.50
15	Brandenburg (DE4)	155.6	14.40
16	South East (UKJ)	153.8	14.26
17	Zuid-Holland (NL33)	149.6	13.91
18	Lombardia (ITC4)	146.6	13.66
19	Limburg (NL42)	145.1	13.54
20	Sterea Ellada (EL64)	145.0	13.53
21	South West (UKK)	142.3	13.31
22	Abruzzo (ITF1)	141.7	13.26
23	Campania (ITF3)	140.4	13.16
24	Ciudad de Melilla (ES64)	140.2	13.13
25	Région lémanique (CH01)	139.8	13.10
26	North East (UKC)	138.4	12.98
27	Noord-Brabant (NL41)	138.0	12.96
28	Northern Ireland (UKN)	137.1	12.88
29	Ticino (CH07)	137.1	12.88
30	Hovedstaden (DK01)	136.7	12.85
31	Scotland (UKM)	136.4	12.82
32	Vlaams Gewest (BE2)	136.3	12.82
33	North West (UKD)	136.2	12.80
34	Nordwestschweiz (CH03)	135.9	12.78
35	Stockholm (SE11)	135.7	12.77
36	Veneto (ITH3)	135.7	12.77
37	West Midlands (UKG)	135.4	12.74
38	East Midlands (UKF)	135.3	12.73
39	Provincia Autonoma Trento (ITH2)	134.6	12.67
40	Yorkshire and The Humber (UKE)	134.1	12.6

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Individuals who have above basic overall digital skills



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Individuals who have above basic overall digital skills

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Regions in the Netherlands dominate the performance in Europe on individuals who have above basic overall digital skills with all 12 regions leading the top 40 best performing regions. Also all regions from both Finland and Norway are included in the top 40.

As shown in the second column in the table below, regional performance within each country is equally distributed. On average, the best performing region performs 1.1 times higher than the worst performing region, and there are thus no large differences between the regions.

In total 102 regions perform above the EU average and 133 regions perform below the EU average. In Austria, Croatia, Denmark, Finland, France, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom, all regions perform above the EU average. In Bulgaria, Czechia, Germany, Greece, Hungary, Italy, Lithuania, Poland, Romania, Serbia, Slovakia, and Slovenia, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	1.1	102	133				
BE	1.0	1	2	NL	1.0	12	0
BG	1.2	0	6	AT	1.0	3	0
CZ	1.1	0	8	PL	1.1	0	17
DK	1.1	5	0	PT	1.1	7	0
DE	1.2	0	38	RO	1.1	0	8
IE	1.0	3	0	SI	1.0	0	2
EL	1.1	0	13	SK	1.1	0	4
ES	1.1	19	0	FI	1.0	4	0
FR	1.3	14	0	SE	1.1	8	0
HR	1.0	4	0	NO	1.0	3	0
IT	1.1	0	21	CH	1.0	7	0
LT	1.0	0	2	RS	1.2	0	4
HU	1.1	0	8	UK	1.1	12	0

Definition of the indicator

Numerator: Number of individuals with above basic overall digital skills

Denominator: Total number of individuals aged 16 to 74

Rationale: Above basic overall digital skills represents the highest level of the overall digital skills indicator, which is a composite indicator based on selected activities performed by individuals on the internet in four specific areas (information, communication, problem solving, content creation). The indicator can be considered as a proxy of the digital competences and skills of individuals. As regional data are not available, estimates are based on the regional variation in Households with broadband access

Missing data: Åland (FI2)

Top 40 regions

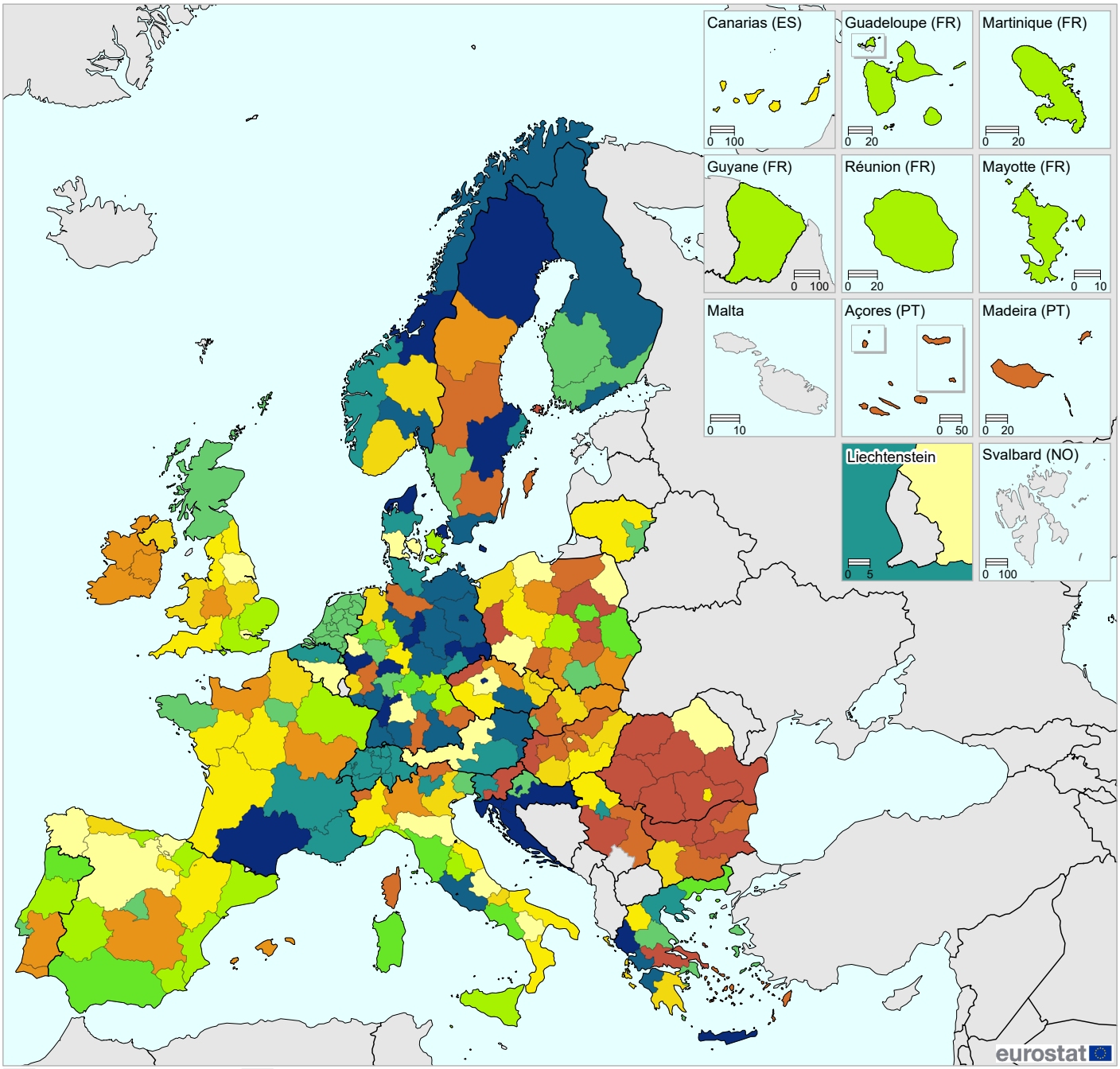
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	26.5
1	Zeeland (NL34)	212.7	52.5
2	Utrecht (NL31)	212.7	52.3
3	Overijssel (NL21)	212.7	52.2
4	Gelderland (NL22)	212.7	51.9
5	Groningen (NL11)	212.7	51.8
6	Noord-Brabant (NL41)	212.7	51.7
7	Noord-Holland (NL32)	212.7	51.7
8	Zuid-Holland (NL33)	212.7	51.7
9	Flevoland (NL23)	212.7	51.6
10	Limburg (NL42)	212.7	51.5
11	Drenthe (NL13)	212.7	51.2
12	Friesland (NL12)	212.7	50.9
13	Helsinki-Uusimaa (FI1B)	211.3	49.3
14	Länsi-Suomi (FI19)	205.9	48.2
15	Etelä-Suomi (FI1C)	203.1	47.6
16	Pohjois- ja Itä-Suomi (FI1D)	199.9	47.0
17	Innlandet (NO02)	181.5	43.2
18	Trøndelag (NO06)	181.2	43.1
19	Nord-Norge (NO07)	180.5	43.0
20	South East (UKJ)	179.6	42.8
21	West Midlands (UKG)	178.0	42.5
22	London (UKI)	177.9	42.5
23	East of England (UKH)	176.6	42.2
24	Oslo og Viken (NO08)	174.8	41.8
25	South West (UKK)	174.2	41.7
26	Vestlandet (NO0A)	172.4	41.3
27	Yorkshire and The Humber (UKE)	171.4	41.1
28	North West (UKD)	171.3	41.1
29	Scotland (UKM)	170.7	41.0
30	Agder og Sør-Østlandet (NO09)	170.7	41.0
31	Zürich (CH04)	170.0	40.9
32	Northern Ireland (UKN)	169.9	40.8
33	Ticino (CH07)	168.4	40.5
34	Région lémanique (CH01)	168.3	40.5
35	Eastern and Midland (IE06)	168.3	40.5
36	Ostschweiz (CH05)	167.6	40.4
37	East Midlands (UKF)	167.6	40.3
38	Wales (UKL)	167.5	40.3
39	Zentralschweiz (CH06)	166.7	40.2
40	Espace Mittelland (CH02)	165.2	39.9

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

R&D expenditure in the public sector as percentage of GDP



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

R&D expenditure in the public sector as percentage of GDP

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Performance is scattered in Europe with 11 countries represented in the top 40 best performing regions. Two regions from Croatia are the best performers, *Grad Zagreb* (HR05) and *Jadranska Hrvatska* (HR03), followed by Trøndelag (NO06) in Norway. In total 18 out of the top 40 best performing regions are in Germany, such as *Dresden* (DED2), *Berlin* (DE3), and *Bremen* (DE5).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 8.1 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Czechia and Finland, where this ratio is above 20.

In total 77 regions perform above the EU average and 162 regions perform below the EU average. In Croatia and Switzerland, all regions perform above the EU average. In Bulgaria, Hungary, Ireland, Lithuania, the Netherlands, Romania, and Spain, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	8.1	77	162				
BE	1.8	2	1	NL	1.0	0	12
BG	13.0	0	6	AT	2.3	2	1
CZ	22.2	2	6	PL	12.1	2	15
DK	3.1	3	2	PT	2.9	1	6
DE	14.9	25	13	RO	16.0	0	8
IE	1.0	0	3	SI	7.5	1	1
EL	10.6	4	9	SK	4.8	1	3
ES	11.7	0	19	FI	27.8	4	1
FR	6.9	5	9	SE	7.1	5	3
HR	12.0	4	0	NO	5.9	4	2
IT	8.8	3	18	CH	1.0	7	0
LT	1.5	0	2	RS	7.4	1	3
HU	3.9	0	8	UK	2.4	1	11

Definition of the indicator

Numerator: All R&D expenditures in the government sector (GOVERD) and the higher education sector (HERD)

Denominator: Regional Gross Domestic Product

Rationale: R&D expenditure represents one of the major drivers of economic growth in a knowledge-based economy. As such, trends in the R&D expenditure indicator provide key indications of the future competitiveness and wealth of a region. R&D spending is essential for making the transition to a knowledge-based economy as well as for improving production technologies and stimulating growth

Missing data: none

Top 40 regions

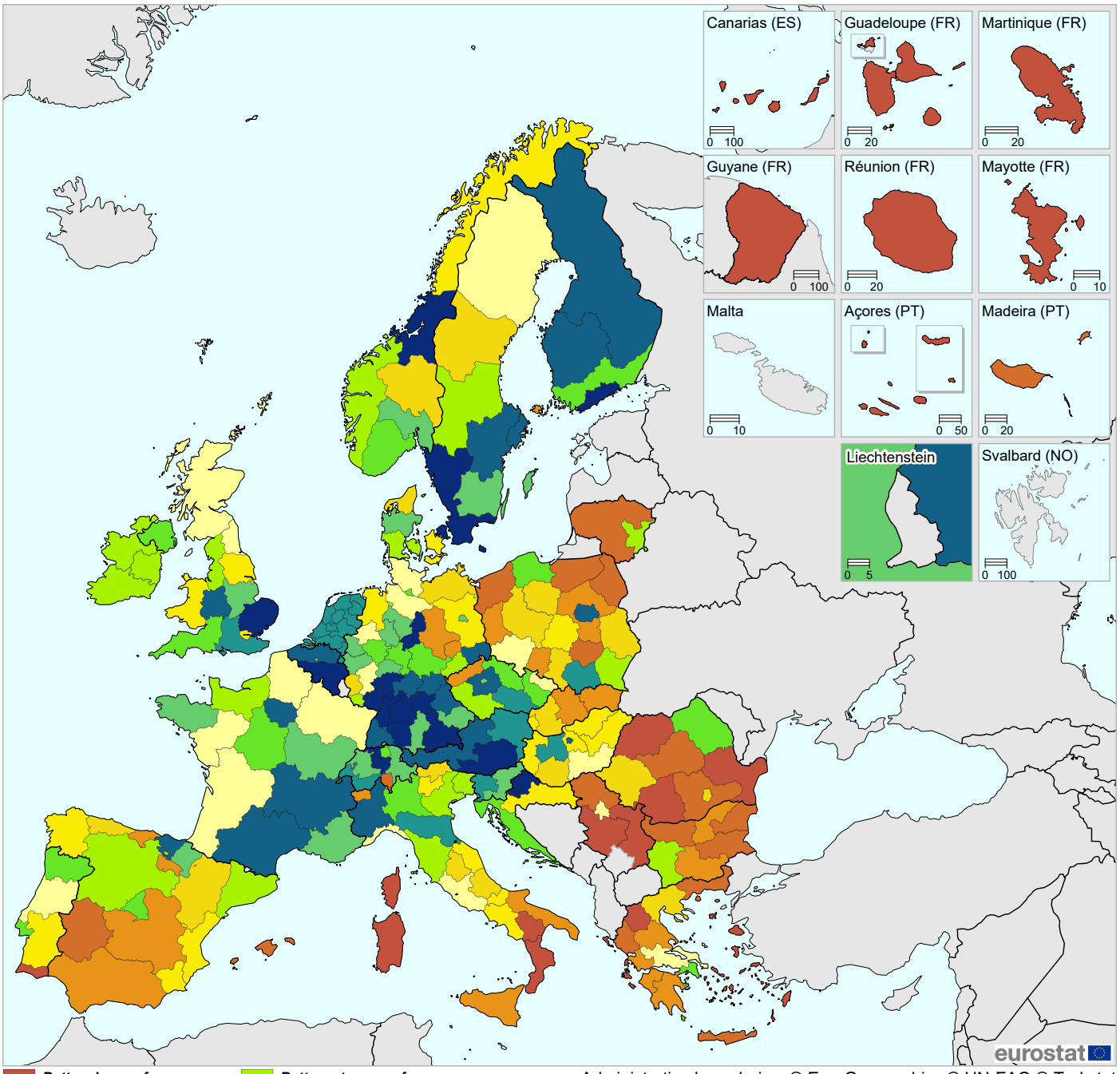
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	0.78
1	Grad Zagreb (HR05)	175.8	9.69
2	Jadranska Hrvatska (HR03)	175.8	2.87
3	Trøndelag (NO06)	175.8	2.30
4	Dresden (DED2)	175.8	2.24
5	Berlin (DE3)	173.5	2.00
6	Bremen (DE5)	175.8	2.00
7	Braunschweig (DE91)	171.1	1.89
8	Panonska Hrvatska (HR02)	163.8	1.84
9	Övre Norrland (SE33)	160.3	1.77
10	Köln (DEA2)	161.8	1.76
11	Leipzig (DED5)	164.8	1.76
12	Karlsruhe (DE12)	157.7	1.69
13	Nordjylland (DK05)	148.2	1.54
14	Östra Mellansverige (SE12)	147.1	1.52
15	Hovedstaden (DK01)	145.5	1.49
16	Occitanie (FRJ)	143.7	1.46
17	Kriti (EL43)	154.1	1.38
18	Nord-Norge (NO07)	137.0	1.34
19	Praha (CZ01)	143.3	1.33
20	Mecklenburg-Vorpommern (DE8)	136.4	1.29
21	Ipeiros (EL54)	146.0	1.28
22	Ostösterreich (AT1)	130.5	1.23
23	Thüringen (DEG)	137.0	1.18
24	Sydsverige (SE22)	127.4	1.18
25	Brandenburg (DE4)	130.5	1.15
26	Sachsen-Anhalt (DEE)	128.0	1.13
27	Helsinki-Uusimaa (FI1B)	122.3	1.11
28	Oberbayern (DE21)	131.7	1.11
29	Dytiki Ellada (EL63)	132.3	1.08
30	Freiburg (DE13)	123.0	1.07
31	Lazio (ITI4)	124.9	1.05
32	Oslo og Viken (NO08)	117.4	1.03
33	Saarland (DEC)	121.0	1.02
34	Jihovýchod (CZ06)	119.7	1.01
35	Tübingen (DE14)	123.6	1.01
36	Pohjois- ja Itä-Suomi (FI1D)	117.1	0.99
37	Hannover (DE92)	117.8	0.98
38	Rheinhessen-Pfalz (DEB3)	119.1	0.98
39	Südösterreich (AT2)	113.7	0.97
40	Hamburg (DE6)	118.4	0.95
41	Grad Zagreb (HR05)	175.8	9.69

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

R&D expenditure in the business sector as percentage of GDP



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

R&D expenditure in the business sector as percentage of GDP

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Performance is well scattered across Europe with 15 countries represented in the top 40 best performing regions. Germany is well represented with 13 regions included in the top 40 best performing regions in Germany, such as *Stuttgart* (DE11), *Tübingen* (DE14), and *Karlsruhe* (DE12). Two regions in Croatia are included in the top 3, *Grad Zagreb* (HR05) in Croatia is the best performing region, *Nordwestschweiz* (CH03) in Switzerland is the second-best performing region.

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 13.6 times higher than the worst performing region. In several countries this ratio is much higher, particularly in France, Germany, Greece, Portugal, and Switzerland, where this ratio is above 20.

In total 49 regions perform above the EU average and 190 regions perform below the EU average. In Austria and Slovenia, all regions perform above the EU average. In Bulgaria, Greece, Ireland, Lithuania, the Netherlands, Portugal, Romania, and Slovakia all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	13.6	49	190				
BE	1.9	2	1.9	NL	1.0	0	12
BG	3.0	0	3.0	AT	2.3	3	0
CZ	5.8	1	5.8	PL	7.3	1	16
DK	7.4	1	7.4	PT	21.5	0	7
DE	20.2	14	20.2	RO	--	0	8
IE	1.0	0	1.0	SI	1.0	2	0
EL	95.0	0	95.0	SK	2.6	0	4
ES	--	1	n/a	FI	7.8	3	2
FR	55.9	4	55.9	SE	8.7	4	4
HR	15.0	3	15.0	NO	5.8	1	5
IT	13.7	2	13.7	CH	24.0	3	4
LT	3.5	0	3.5	RS	12.8	0	4
HU	4.4	1	4.4	UK	4.9	3	9

-- = Could not be calculated.

Definition of the indicator

Numerator: All R&D expenditures in the business sector (BERD)

Denominator: Regional Gross Domestic Product

Rationale: The indicator captures the formal creation of new knowledge within firms. It is particularly important in the science-based sector (pharmaceuticals, chemicals and some areas of electronics), where most new knowledge is created in or near R&D laboratories

Missing data: none

Top 40 regions

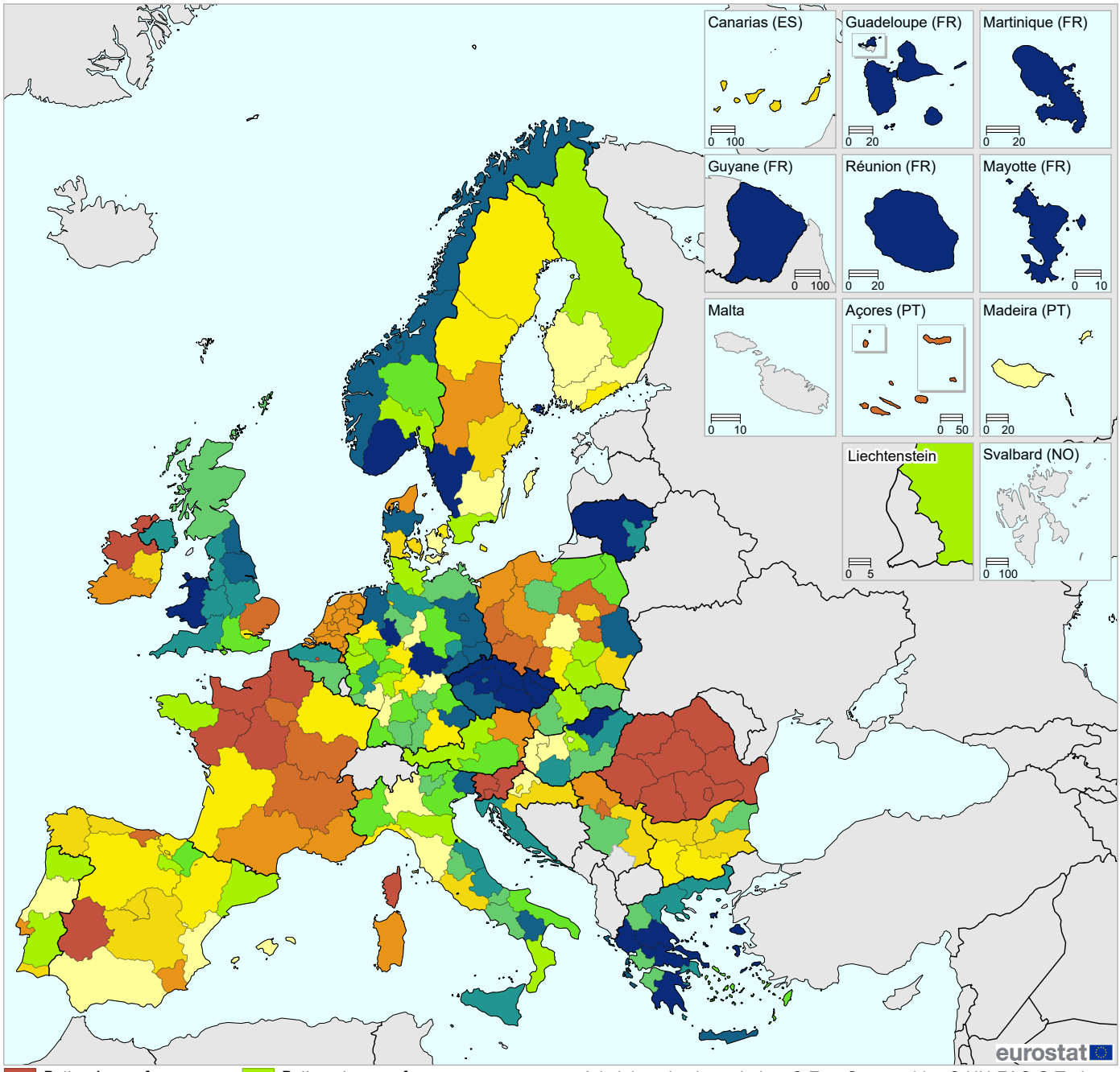
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	1.51
1	Grad Zagreb (HR05)	148.3	8.39
2	Nordwestschweiz (CH03)	148.3	7.68
3	Sjeverna Hrvatska (HR06)	148.3	6.92
4	Stuttgart (DE11)	148.3	6.88
5	Braunschweig (DE91)	148.3	5.89
6	Västsverige (SE23)	148.3	4.24
7	Tübingen (DE14)	148.3	4.19
8	Karlsruhe (DE12)	148.3	3.63
9	Südösterreich (AT2)	148.3	3.60
10	Oberbayern (DE21)	148.1	3.31
11	Rheinhessen-Pfalz (DEB3)	143.3	3.10
12	Hovedstaden (DK01)	143.1	3.09
13	Région wallonne (BE3)	136.7	2.82
14	Mittelfranken (DE25)	135.9	2.79
15	East of England (UKH)	135.7	2.78
16	Trøndelag (NO06)	134.7	2.74
17	Darmstadt (DE71)	133.0	2.67
18	Zentralschweiz (CH06)	128.9	2.51
19	Sydsverige (SE22)	127.6	2.46
20	Stockholm (SE11)	127.4	2.45
21	Vlaams Gewest (BE2)	126.1	2.40
22	Östra Mellansverige (SE12)	125.5	2.38
23	Helsinki-Uusimaa (FI1B)	130.0	2.35
24	Westösterreich (AT3)	122.1	2.25
25	Occitanie (FRJ)	121.7	2.24
26	Dresden (DED2)	120.7	2.20
27	Unterfranken (DE26)	120.4	2.19
28	Oberpfalz (DE23)	120.2	2.18
29	Île de France (FR1)	114.5	1.98
30	Oberfranken (DE24)	113.3	1.94
31	Střední Čechy (CZ02)	105.8	1.93
32	Budapest (HU11)	115.1	1.89
33	Länsi-Suomi (FI19)	113.3	1.83
34	Freiburg (DE13)	109.8	1.82
35	Auvergne - Rhône-Alpes (FRK)	109.5	1.81
36	Piemonte (ITC1)	111.0	1.78
37	Warszawski stołeczny (PL91)	112.2	1.76
38	West Midlands (UKG)	107.0	1.73
39	South East (UKJ)	103.6	1.62
40	Emilia-Romagna (ITH5)	103.6	1.61

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Non-R&D innovation expenditures in SMEs as percentage of turnover



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Non-R&D innovation expenditures in SMEs as percentage of turnover

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Performance is well scattered across Europe with 14 countries represented in the top 40 best performing regions, including all eight regions from Czechia. From both German and Greece seven regions are included the top-40. *Wales* (UKL), based on the confidential indicator value, is the best performing region, followed by *Régions ultrapériphériques françaises* (FRY) and *Severozápad* (CZ04).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 10.7 times higher than the worst performing region. In several countries this ratio is much higher, particularly in France, Romania, and the United Kingdom, where this ratio is above 30.

In total 100 regions perform above the EU average and 132 regions perform below the EU average. In Czechia, Greece, and Lithuania, all regions perform above the EU average. In Ireland, the Netherlands, Romania, and Slovenia all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	10.7	100	132				
BE	6.1	2	1	NL	1.0	0	12
BG	2.1	1	5	AT	2.3	2	1
CZ	2.2	8	0	PL	5.3	4	13
DK	4.2	1	4	PT	2.7	1	6
DE	4.5	26	12	RO	30.1	0	8
IE	10.3	0	3	SI	1.2	0	2
EL	3.0	13	0	SK	2.6	2	2
ES	--	1	18	FI	4.5	1	4
FR	65.1	1	13	SE	4.4	1	7
HR	2.5	1	3	NO	2.4	5	1
IT	4.9	13	8	CH	--	--	--
LT	1.9	2	0	RS	3.4	1	3
HU	5.8	4	4	UK	84.7	10	2

-- = Could not be calculated.

Definition of the indicator

Numerator: Sum of total innovation expenditure for SMEs, excluding intramural and extramural R&D expenditures

Denominator: Total turnover for SMEs

Rationale: Several of the non-R&D components of innovation expenditure, such as investment in equipment and machinery and the acquisition of patents and licenses, measure the diffusion of new production technology and ideas

Missing data: all 7 Swiss regions

Top 40 regions

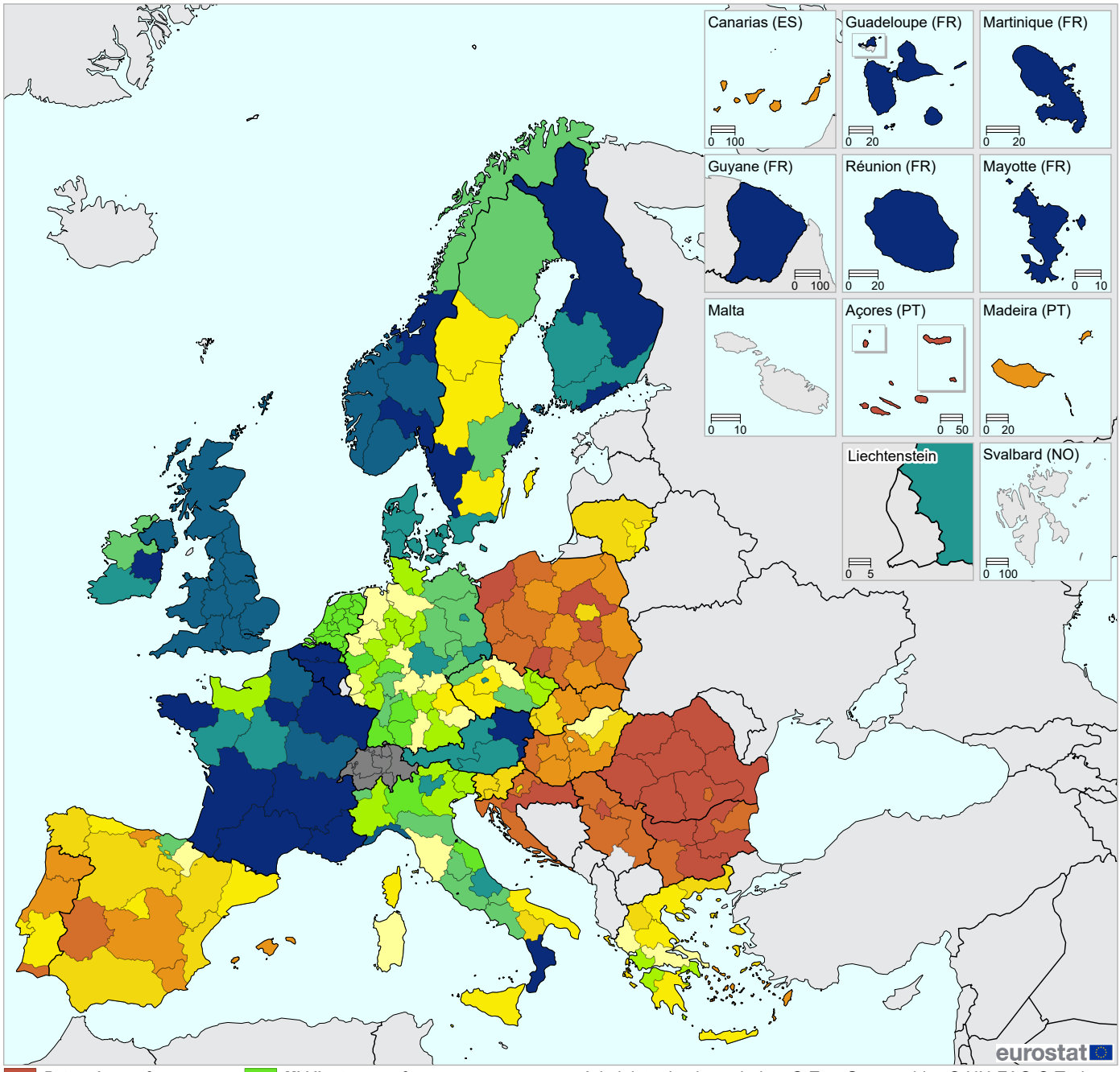
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	0.53
1	Wales (UKL)	247.5	c
2	Régions ultrapériphériques françaises (FRY)	247.5	c
3	Severozápad (CZ04)	213.2	c
4	Észak-Magyarország (HU31)	212.2	c
5	Moravskoslezsko (CZ08)	211.7	c
6	Jihovýchod (CZ06)	193.8	c
7	Severovýchod (CZ05)	193.0	c
8	Střední Morava (CZ07)	191.3	c
9	Peloponnisos (EL65)	185.1	c
10	Åland (FI2)	181.7	c
11	Vidurio ir vakaru Lietuvos regionas (LT02)	169.7	c
12	Detmold (DEA4)	162.1	c
13	Thessalia (EL61)	160.5	c
14	Střední Čechy (CZ02)	156.6	c
15	Ipeiros (EL54)	154.0	c
16	Thüringen (DEG)	152.6	c
17	Sterea Ellada (EL64)	152.6	c
18	Voreio Aigaio (EL41)	149.9	c
19	Agder og Sør-Østlandet (NO09)	149.7	c
20	Västsverige (SE23)	146.4	c
21	Dresden (DED2)	146.0	c
22	Trøndelag (NO06)	145.1	c
23	Praha (CZ01)	144.8	c
24	Jihozápad (CZ03)	144.3	c
25	Niederbayern (DE22)	144.0	c
26	Kriti (EL43)	143.9	c
27	Brandenburg (DE4)	143.0	c
28	Basilicata (ITF5)	142.9	c
29	Friuli-Venezia Giulia (ITH4)	142.1	c
30	Chemnitz (DED4)	141.4	c
31	Ionia Nisia (EL62)	141.1	c
32	Berlin (DE3)	139.5	c
33	Midtjylland (DK04)	138.5	c
34	Nord-Norge (NO07)	130.7	c
35	Weser-Ems (DE94)	129.1	c
36	Lubelskie (PL81)	128.9	c
37	Yorkshire and The Humber (UKE)	128.7	c
38	North East (UKC)	128.6	c
39	Vestlandet (NO0A)	128.5	c
40	Vlaams Gewest (BE2)	128.3	c

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Innovation expenditures per person employed (SMEs)



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Innovation expenditures per person employed (SMEs)

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Performance is scattered across Europe with nine countries represented in the top 40 best performing regions. France is well represented with 10 regions, including the top 3 regions: *Régions ultrapériphériques françaises* (FRY), *Bretagne* (FRH) and *Île de France* (FR1). All 12 regions from the United Kingdom are included in the top-40 best performing regions but only because regional data are not available and for all regions missing data have been imputed with the indicator value of the United Kingdom. All 3 regions from Belgium are included and are among the top-6 best performing regions.

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 4.8 times higher than the worst performing region. In several countries this ratio is much higher, particularly in France and Romania, where this ratio is above 20.

In total 80 regions perform above the EU average and 152 regions perform below the EU average. In Austria, Belgium, Denmark, Finland, Ireland, Norway, and the United Kingdom, all regions perform above the EU average. In Bulgaria, Croatia, Greece, Lithuania, the Netherlands, Poland, Portugal, Romania, Serbia, Slovakia and Slovenia, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	4.8	80	152				
BE	1.5	3	0	NL	1.0	0	12
BG	2.2	0	6	AT	1.6	3	0
CZ	1.9	3	5	PL	5.3	0	17
DK	1.0	5	0	PT	7.1	0	7
DE	1.9	4	34	RO	23.0	0	8
IE	2.5	3	0	SI	1.2	0	2
EL	3.1	0	13	SK	1.5	0	4
ES	--	1	18	FI	2.0	5	0
FR	36.5	12	2	SE	4.3	5	3
HR	3.0	0	4	NO	2.3	6	0
IT	--	5	16	CH	--	--	--
LT	1.3	0	2	RS	1.4	0	4
HU	2.9	2	6	UK	1.0	12	0

-- = Could not be calculated.

Definition of the indicator

Numerator: Sum of total innovation expenditure by enterprises in all size classes in Purchasing Power Standards (PPS)

Denominator: Total employment in SMEs

Rationale: The indicator measures the monetary input directly related to innovation activities

Note: for all regions in Denmark, the Netherlands, Slovenia and the United Kingdom, there are no regional data and the result for the country has been used for all regions in the country

Missing data: all 7 Swiss regions

Top 40 regions

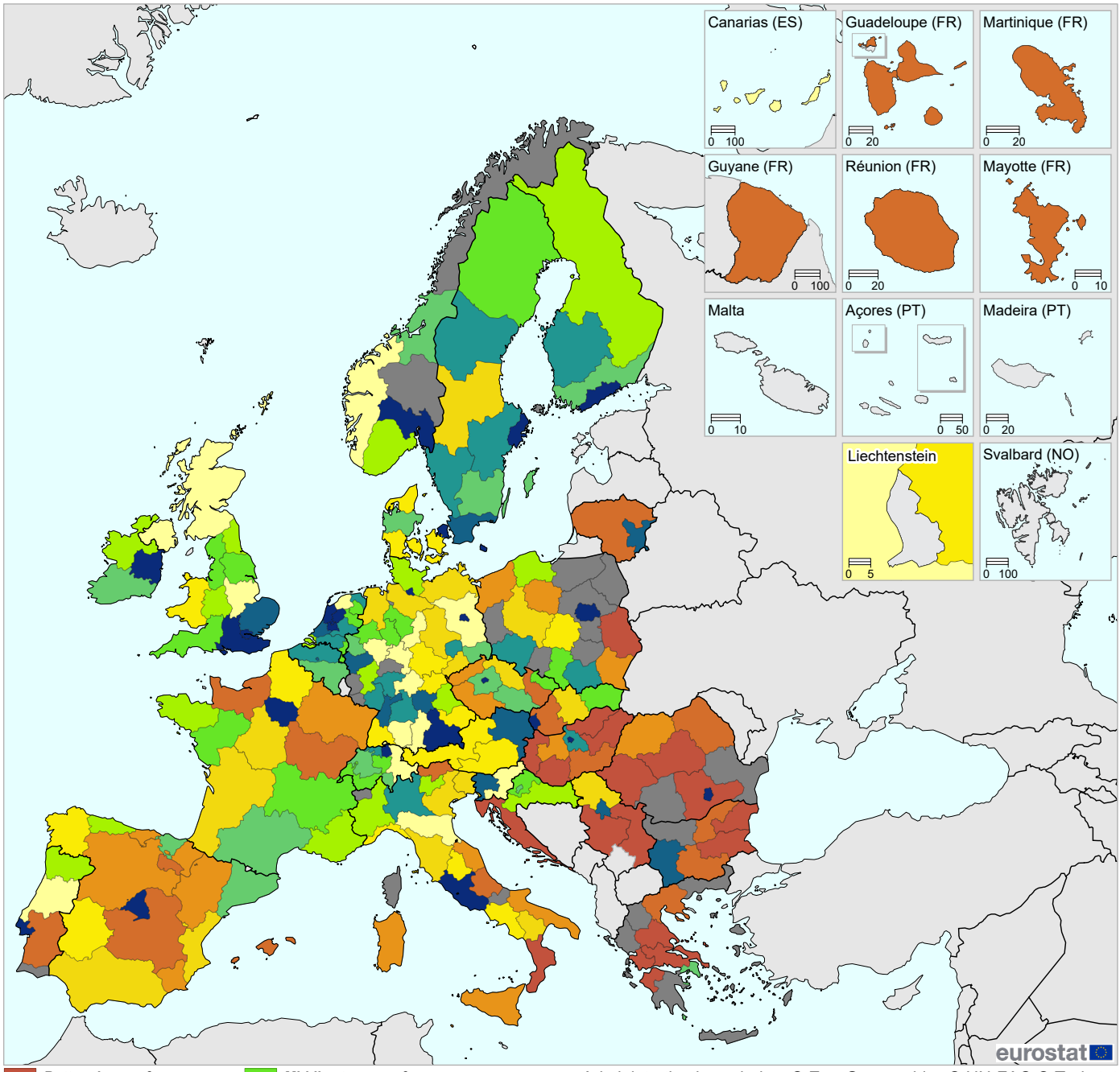
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	4,369
1	Régions ultrapériphériques françaises (FRY)	166.0	c
2	Bretagne (FRH)	166.0	c
3	Île de France (FR1)	166.0	c
4	Région wallonne (BE3)	166.0	c
5	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	166.0	c
6	Vlaams Gewest (BE2)	166.0	c
7	Provence-Alpes-Côte d'Azur (FRL)	166.0	c
8	Eastern and Midland (IE06)	166.0	c
9	Oslo og Viken (NO08)	163.0	c
10	Occitanie (FRJ)	160.6	c
11	Helsinki-Uusimaa (FI1B)	160.0	c
12	Västsverige (SE23)	159.3	c
13	Grand Est (FRF)	152.9	c
14	Auvergne - Rhône-Alpes (FRK)	151.7	c
15	Calabria (ITF6)	149.3	c
16	Pohjois- ja Itä-Suomi (FI1D)	148.0	c
17	Stockholm (SE11)	145.0	c
18	Nouvelle-Aquitaine (FRI)	144.1	c
19	Trøndelag (NO06)	142.7	c
20	Ostösterreich (AT1)	137.7	c
21	Agder og Sør-Østlandet (NO09)	135.5	c
22	Vestlandet (NO0A)	129.5	c
23	Bourgogne - Franche-Comté (FRC)	129.3	c
24	Innlandet (NO02)	127.8	c
25	Liguria (ITC3)	125.1	c
26	Hauts-de-France (FRE)	124.2	c
27	Åland (FI2)	123.3	c
28	East Midlands (UKF)	122.4	c
	East of England (UKH)		
	London (UKI)		
	North East (UKC)		
	North West (UKD)		
	Northern Ireland (UKN)		
	Scotland (UKM)		
	South East (UKJ)		
	South West (UKK)		
	Wales (UKL)		
	West Midlands (UKG)		
	Yorkshire and The Humber (UKE)		
40	Sydsverige (SE22)	121.9	c

c = confidential; Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Employed ICT specialists as a percentage of total employment



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Employed ICT specialists as a percentage of total employment

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Performance is very well scattered across Europe with as many as 24 countries represented in the top 40 best performing regions. Germany is well represented with 8 regions included, followed by the Netherlands with 4 regions. *Stockholm* (SE11) is the best performing region, followed by *Bratislavský kraj* (SK01) and *Praha* (CZ01).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 4.8 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Bulgaria, Hungary, and Romania, where this ratio is above 7.

In total 65 regions perform above the EU average and 142 regions perform below the EU average. Belgium is the only country of which all regions perform above the EU average. There is no country where all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	4.8	65	142				
BE	1.7	3	0	NL	3.0	7	5
BG	7.4	1	4	AT	2.2	1	2
CZ	6.6	2	6	PL	5.7	3	8
DK	3.4	2	3	PT	4.2	1	3
DE	4.8	11	23	RO	10.5	1	5
IE	2.3	1	2	SI	1.9	1	1
EL	6.1	1	4	SK	6.9	1	3
ES	4.9	2	15	FI	3.5	3	1
FR	5.5	2	11	SE	6.6	6	2
HR	4.1	1	3	NO	2.6	2	2
IT	5.3	2	17	CH	2.9	4	3
LT	4.1	1	1	RS	6.6	1	3
HU	9.4	2	6	UK	3.5	3	9

Definition of the indicator

Numerator: Number of employed ICT specialists

Denominator: Total employment (Eurostat)

Rationale: Measuring the "employment in the industries most implicated in the digital transformation" in proportion to the total employment allows to estimate the size of the digital economy in a country

Missing data: 32 regions, including Severozapaden (BG31), Bremen (DE5), Gießen (DE72), Trier (DEB2), Saarland (DEC), Voreio Aigaio (EL41), Notio Aigaio (EL42), Kriti (EL43), Anatoliki Makedonia, Thraki (EL51), Dytiki Makedonia (EL53), Ipeiros (EL54), Ionia Nisia (EL62), Peloponnisos (EL65), Ciudad de Ceuta (ES63), Ciudad de Melilla (ES64), Åland (FI2), Corse (FRM), Valle d'Aosta/Vallée d'Aoste (ITC2), Molise (ITF2), Innlandet (NO02), Nord-Norge (NO07), Lubuskie (PL43), Opolskie (PL52), Warminsko-Mazurskie (PL62), Swietokrzyskie

Top 40 regions

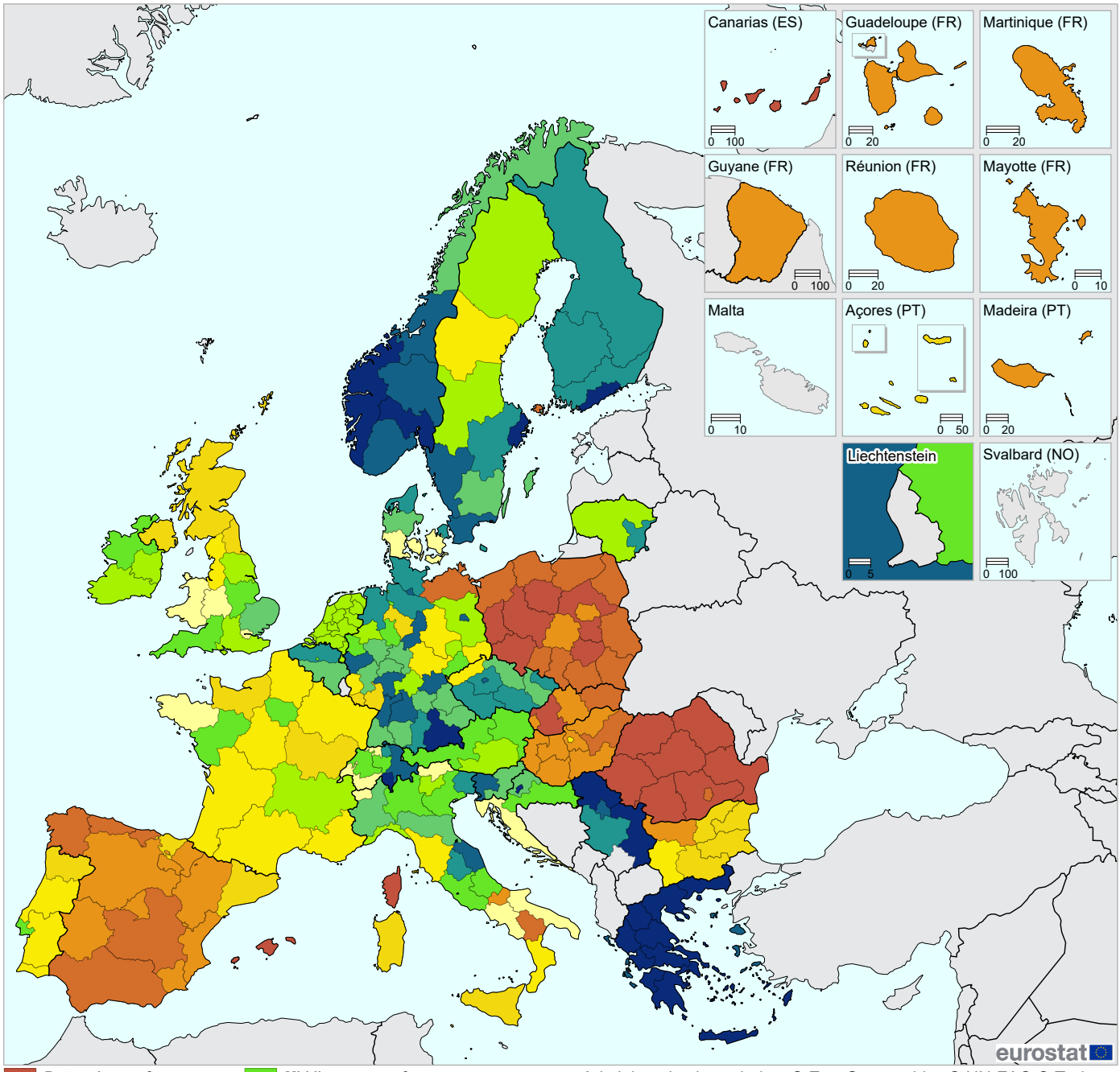
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	4.5
1	Stockholm (SE11)	189.7	15.7
2	Bratislavský kraj (SK01)	189.7	13.5
3	Praha (CZ01)	189.7	13.2
4	Helsinki-Uusimaa (FI1B)	189.7	12.7
5	Berlin (DE3)	189.7	11.8
6	Budapest (HU11)	189.7	11.2
7	Noord-Holland (NL32)	189.7	10.4
8	London (UKI)	189.7	10.3
9	Zürich (CH04)	189.7	10.0
10	Hovedstaden (DK01)	189.7	9.6
11	Utrecht (NL31)	189.7	9.5
12	Bucuresti - Ilfov (RO32)	189.7	9.4
13	Île de France (FR1)	189.7	9.3
14	Flevoland (NL23)	189.7	9.1
15	Comunidad de Madrid (ES3)	189.7	8.9
16	Warszawski stoleczny (PL91)	189.7	8.8
17	Oslo og Viken (NO08)	189.7	8.7
18	Hamburg (DE6)	189.7	8.5
19	Lisboa (PT17)	189.7	8.5
20	Lazio (ITI4)	189.7	8.5
21	Eastern and Midland (IE06)	189.7	8.3
22	Oberbayern (DE21)	189.7	8.3
23	South East (UKJ)	189.7	8.2
24	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	185.4	7.9
25	Sydsverige (SE22)	181.6	7.7
26	Sostines regionas (LT01)	178.6	7.6
27	Yugozapaden (BG41)	173.6	7.4
28	Beogradski region (RS11)	172.4	7.4
29	Karlsruhe (DE12)	171.4	7.3
30	Zuid-Holland (NL33)	163.3	7.0
31	Köln (DEA2)	152.1	6.6
32	Mittelfranken (DE25)	150.7	6.5
33	Ostösterreich (AT1)	150.3	6.5
34	Zahodna Slovenija (SI04)	144.9	6.3
35	East of England (UKH)	138.1	6.0
36	Darmstadt (DE71)	137.7	6.0
37	Malopolskie (PL21)	130.3	5.7
38	Leipzig (DED5)	129.1	5.7
39	Vlaams Gewest (BE2)	128.1	5.6
40	Noord-Brabant (NL41)	125.5	5.5

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

SMEs introducing product innovations as percentage of SMEs



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

SMEs introducing product innovations as percentage of SMEs

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Top performing regions are dominated by regions from Greece (all 13 regions, of which 9 regions are in the top-10 best performing regions), Germany (9 regions), and Norway (5 regions). The overall best performing region is *Ipeiros* (EL54), followed by *Dytiki Ellada* (EL63) and *Sterea Ellada* (EL64),

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 2.5 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Romania and Spain, where this ratio is above 3.

In total 131 regions perform above the EU average and 108 regions perform below the EU average. In Austria, Belgium, Croatia, Greece, Ireland, Lithuania, the Netherlands, Norway, Serbia, and Slovenia, all regions perform above the EU average. In Bulgaria, Hungary, Poland, Slovakia, and Spain, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	2.5	131	108				
BE	1.1	3	0	NL	1.0	12	0
BG	1.3	0	6	AT	1.1	3	0
CZ	1.6	7	1	PL	2.2	0	17
DK	1.3	4	1	PT	1.5	1	6
DE	3.6	30	8	RO	10.4	0	8
IE	1.1	3	0	SI	1.1	2	0
EL	1.6	13	0	SK	1.7	0	4
ES	11.2	0	19	FI	3.2	4	1
FR	4.1	3	11	SE	1.7	7	1
HR	1.6	4	0	NO	1.5	6	0
IT	2.4	12	9	CH	1.7	6	1
LT	1.2	2	0	RS	1.2	4	0
HU	1.6	0	8	UK	1.6	5	7

Definition of the indicator

Numerator: Number of SMEs that introduced who introduced at least one product innovation

Denominator: Total number of SMEs

Rationale: Product innovation is a key ingredient to innovation as they can create new markers and improve competitiveness. Higher shares of product innovators reflect a higher level of innovation activities

Missing data: none

Top 40 regions

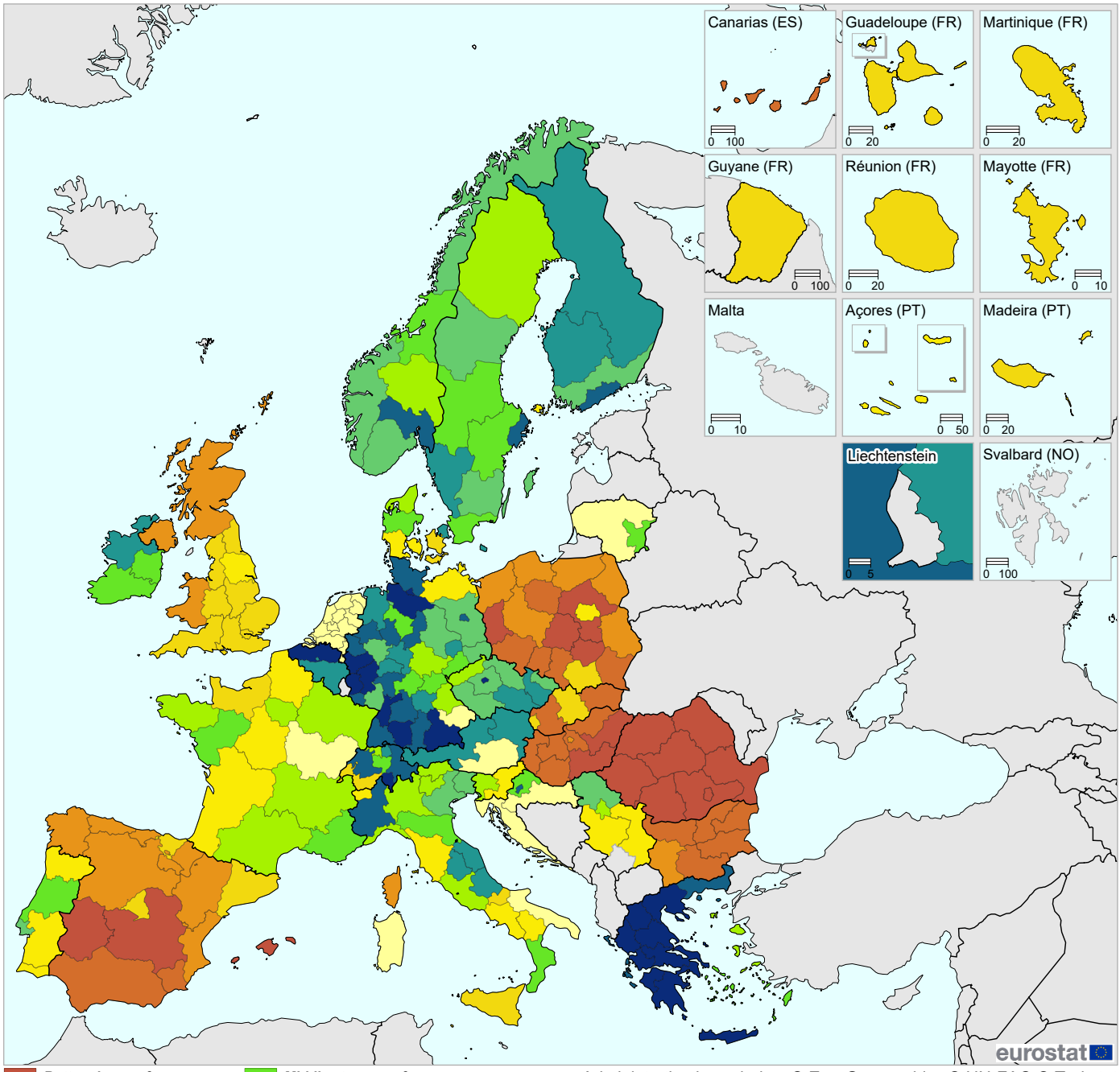
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	27.3
1	Ipeiros (EL54)	179.1	c
2	Dytiki Ellada (EL63)	179.1	c
3	Sterea Ellada (EL64)	179.1	c
4	Kriti (EL43)	179.1	c
5	Oslo og Viken (NO08)	179.1	c
6	Peloponnisos (EL65)	179.1	c
7	Kentriki Makedonia (EL52)	179.1	c
8	Thessalia (EL61)	179.1	c
9	Notio Aigaio (EL42)	179.1	c
10	Attiki (EL3)	179.1	c
11	Oberbayern (DE21)	179.1	c
12	Ticino (CH07)	178.1	c
13	Grad Zagreb (HR05)	177.9	c
14	Dytiki Makedonia (EL53)	176.7	c
15	Helsinki-Uusimaa (FI1B)	171.0	c
16	Stockholm (SE11)	169.8	c
17	Vestlandet (NO0A)	164.7	c
18	Region Vojvodine (RS12)	163.9	c
19	Anatoliki Makedonia, Thraki (EL51)	163.3	c
20	Region Juzne i Istocne Srbije (RS22)	163.1	c
21	Praha (CZ01)	162.8	c
22	Köln (DEA2)	162.2	c
23	Agder og Sør-Østlandet (NO09)	160.6	c
24	Sydsverige (SE22)	160.2	c
25	Beogradski region (RS11)	156.6	c
26	Ostschweiz (CH05)	155.3	c
27	Västsverige (SE23)	152.7	c
28	Braunschweig (DE91)	151.1	c
29	Marche (ITI3)	150.7	c
30	Trøndelag (NO06)	147.1	c
31	Innlandet (NO02)	146.2	c
32	Voreio Aigaio (EL41)	143.7	c
33	Darmstadt (DE71)	142.4	c
34	Karlsruhe (DE12)	142.3	c
35	Stuttgart (DE11)	141.8	c
36	Berlin (DE3)	141.4	c
37	Zahodna Slovenija (SI04)	141.2	c
38	Ionia Nisia (EL62)	141.1	c
39	Hamburg (DE6)	140.9	c
40	Oberfranken (DE24)	140.9	c

c = confidential; Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

SMEs introducing business process innovations as percentage of SMEs



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

SMEs introducing business process innovations as percentage of SMEs

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Top performing regions are dominated by regions from Greece (11 regions, of which eight regions are in the top-10 best performing regions) and Germany (19 regions). The overall best performing region is *Kentriki Makedonia* (EL52), followed by *Dytiki Ellada* (EL63) and Kriti (EL43). The best performing German region is *Koblenz* (DEB1).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 1.9 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Romania and Spain, where this ratio is above 7.

In total 136 regions perform above the EU average and 103 regions perform below the EU average. In Austria, Belgium, Czechia, Greece, Ireland, Lithuania, the Netherlands, Norway, and Sweden all regions perform above the EU average. In Bulgaria, Hungary, Poland, Romania, Slovakia, Spain, and the United Kingdom, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	1.9	136	103				
BE	1.3	3	0	NL	1.0	12	0
BG	1.3	0	6	AT	1.2	3	0
CZ	1.4	8	0	PL	2.5	0	17
DK	1.5	3	2	PT	1.5	2	5
DE	1.9	36	2	RO	7.5	0	8
IE	1.1	3	0	SI	1.1	1	1
EL	1.6	13	0	SK	1.5	0	4
ES	7.8	0	19	FI	1.4	4	1
FR	1.7	7	7	SE	1.2	8	0
HR	1.3	3	1	NO	1.2	6	0
IT	1.8	14	7	CH	1.8	6	1
LT	1.1	2	0	RS	1.2	2	2
HU	1.5	0	8	UK	1.4	0	12

Definition of the indicator

Numerator: Number of SMEs that introduced who introduced at least one business process innovation

Denominator: Total number of SMEs

Rationale: Many firms innovate not by improving new products but by improving their business processes. Business process innovations include process, marketing and organisational innovations

Missing data: none

Top 40 regions

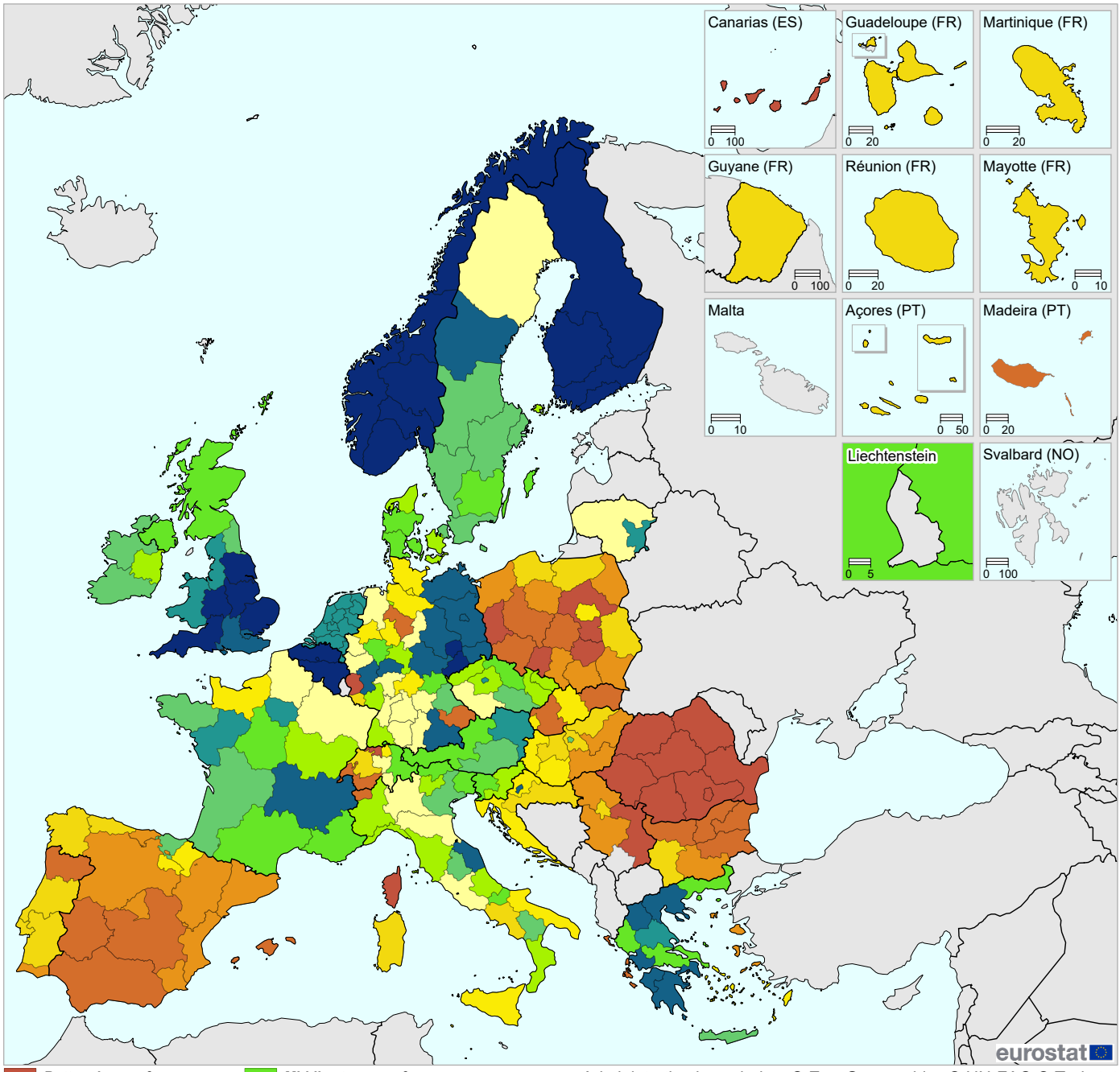
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	42.5
1	Kentriki Makedonia (EL52)	154.8	c
2	Dytiki Ellada (EL63)	154.8	c
3	Kriti (EL43)	154.8	c
4	Peloponnisos (EL65)	154.8	c
5	Ipeiros (EL54)	154.8	c
6	Vlaams Gewest (BE2)	154.8	c
7	Koblenz (DEB1)	154.8	c
8	Attiki (EL3)	154.8	c
9	Thessalia (EL61)	154.8	c
10	Sterea Ellada (EL64)	154.8	c
11	Hamburg (DE6)	154.8	c
12	Oberbayern (DE21)	154.8	c
13	Lüneburg (DE93)	154.8	c
14	Praha (CZ01)	154.8	c
15	Ticino (CH07)	154.8	c
16	Karlsruhe (DE12)	151.6	c
17	Dytiki Makedonia (EL53)	150.6	c
18	Tübingen (DE14)	149.5	c
19	Köln (DEA2)	148.9	c
20	Trier (DEB2)	147.1	c
21	Stuttgart (DE11)	147.1	c
22	Anatoliki Makedonia, Thraki (EL51)	146.9	c
23	Berlin (DE3)	146.2	c
24	Braunschweig (DE91)	145.0	c
25	Düsseldorf (DEA1)	143.7	c
26	Münster (DEA3)	143.3	c
27	Piemonte (ITC1)	142.9	c
28	Ionia Nisia (EL62)	142.7	c
29	Helsinki-Uusimaa (FI1B)	140.8	c
30	Espace Mittelland (CH02)	140.2	c
31	Saarland (DEC)	139.4	c
32	Stockholm (SE11)	138.3	c
33	Schleswig-Holstein (DEF)	138.2	c
34	Darmstadt (DE71)	138.1	c
35	Oslo og Viken (NO08)	138.1	c
36	Schwaben (DE27)	137.8	c
37	Grad Zagreb (HR05)	136.7	c
38	Freiburg (DE13)	136.6	c
39	Ostschweiz (CH05)	136.1	c
40	Detmold (DEA4)	135.9	c

c = confidential; Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Innovative SMEs collaborating with others as percentage of SMEs



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Innovative SMEs collaborating with others as percentage of SMEs

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Top performing regions are dominated by regions from Germany (11 regions), United Kingdom (7 regions), Norway (all 6 regions), and Greece (5 regions). The overall best performing region is *Trøndelag* (NO06), followed by *Vestlandet* (NO0A) and *Agder og Sør-Østlandet* (NO09).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 2.4 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Germany and Romania, where this ratio is above five.

In total 120 regions perform above the EU average and 119 regions perform below the EU average. In Austria, Belgium, Denmark, Ireland, the Netherlands, Norway, Slovenia and the United Kingdom, all regions perform above the EU average. In Bulgaria, Poland, Portugal, Romania, Serbia, and Slovakia, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	2.4	120	119				
BE	1.2	3	0	NL	1.0	12	0
BG	1.7	0	6	AT	1.3	3	0
CZ	1.5	7	1	PL	4.3	0	17
DK	1.2	5	0	PT	1.8	0	7
DE	5.5	18	20	RO	6.0	0	8
IE	1.3	3	0	SI	1.1	2	0
EL	4.1	10	3	SK	1.9	0	4
ES	--	1	18	FI	2.3	5	0
FR	4.3	9	5	SE	1.7	7	1
HR	2.3	1	3	NO	1.2	6	0
IT	3.4	13	8	CH	3.3	1	6
LT	1.6	1	1	RS	2.2	0	4
HU	2.3	1	7	UK	1.9	12	0

-- = Could not be calculated.

Definition of the indicator

Numerator: Number of SMEs with innovation co-operation activities (i.e., that have had any co-operation agreements on innovation activities with other enterprises or institutions)
Denominator: Total number of SMEs

Rationale: This indicator measures the degree to which SMEs are involved in innovation co-operation. Complex innovations often depend on enterprises' ability to draw on diverse sources of information and knowledge, or to collaborate on the development of an innovation. This indicator measures the flow of knowledge between public research institutions and enterprises, and between enterprises and other enterprises

Missing data: none

Top 40 regions

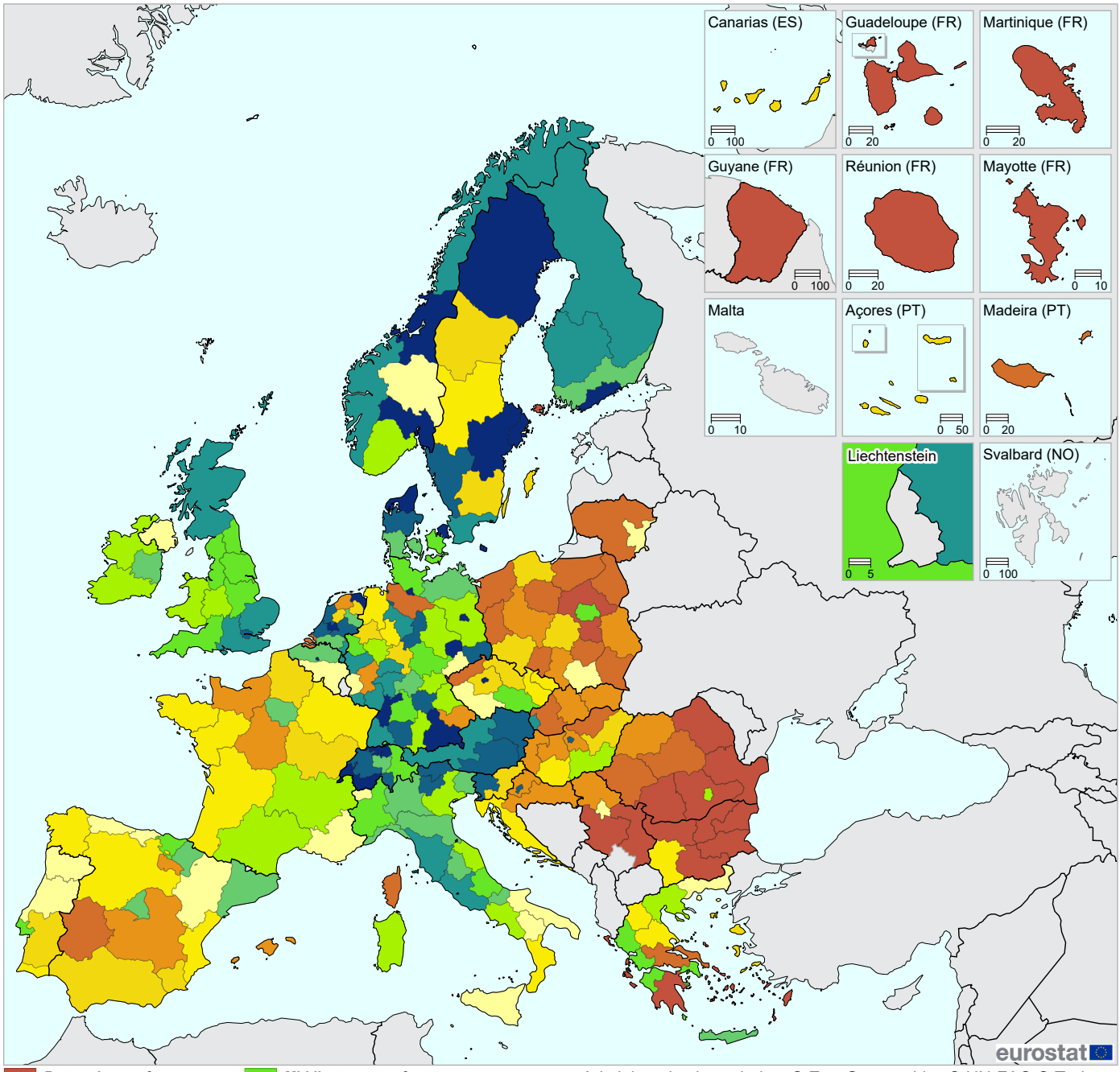
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	12.5
1	Trøndelag (NO06)	205.4	c
2	Vestlandet (NO0A)	205.4	c
3	Agder og Sør-Østlandet (NO09)	205.4	c
4	Innlandet (NO02)	205.4	c
5	Oslo og Viken (NO08)	205.4	c
6	Länsi-Suomi (FI19)	205.4	c
7	Nord-Norge (NO07)	205.4	c
8	Pohjois- ja Itä-Suomi (FI1D)	205.4	c
9	Helsinki-Uusimaa (FI1B)	205.4	c
10	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	205.4	c
11	Yorkshire and The Humber (UKE)	205.4	c
12	South West (UKK)	205.4	c
13	East Midlands (UKF)	205.4	c
14	Etelä-Suomi (FI1C)	205.4	c
15	West Midlands (UKG)	205.4	c
16	Région wallonne (BE3)	197.1	c
17	Chemnitz (DED4)	197.1	c
18	Leipzig (DED5)	193.7	c
19	East of England (UKH)	192.8	c
20	Vlaams Gewest (BE2)	191.4	c
21	Dresden (DED2)	190.2	c
22	Dytiki Ellada (EL63)	188.6	c
23	Peloponnisos (EL65)	188.6	c
24	Thüringen (DEG)	186.9	c
25	Berlin (DE3)	181.3	c
26	South East (UKJ)	177.2	c
27	Attiki (EL3)	170.0	c
28	Sachsen-Anhalt (DEE)	169.0	c
29	Mellersta Norrland (SE32)	162.2	c
30	Kentriki Makedonia (EL52)	158.1	c
31	London (UKI)	157.9	c
32	Auvergne - Rhône-Alpes (FRK)	156.2	c
33	Grad Zagreb (HR05)	154.2	c
34	Gießen (DE72)	153.9	c
35	Marche (ITI3)	153.0	c
36	Mecklenburg-Vorpommern (DE8)	151.5	c
37	Koblenz (DEB1)	150.6	c
38	Dytiki Makedonia (EL53)	150.2	c
39	Oberbayern (DE21)	149.6	c
40	Brandenburg (DE4)	149.4	c

c = confidential; Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Public-private co-publications per million population



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Public-private co-publications per million population

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right, including many capital city regions. Regions from 15 countries are included, with most regions from Germany (10), the Netherlands (5), Switzerland (5), Sweden (4), and Denmark (3). The best performing region is *Trøndelag* (NO06) with close to 3,000 public-private publications, followed by two regions from Switzerland: *Nordwestschweiz* (CH03) and *Zürich* (CH04).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 10.6 times higher than the worst performing region. In several countries this ratio even higher, particularly in Spain and the Netherlands.

In total 163 regions perform above the EU average and 76 regions perform below the EU average (due to multiple co-authorships across EU Member States, the EU average is relatively low). In Austria, Belgium, Denmark, Ireland, Italy, Norway, Slovenia, Switzerland, and the United Kingdom, all regions perform above the EU average. There is no country where all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	10.6	163	76				
BE	4.0	3	0	NL	19.6	8	4
BG	17.5	1	5	AT	1.7	3	0
CZ	16.4	5	3	PL	22.7	3	14
DK	4.6	5	0	PT	4.7	5	2
DE	14.2	33	5	RO	13.7	1	7
IE	1.5	3	0	SI	4.5	2	0
EL	17.0	8	5	SK	9.6	1	3
ES	33.4	11	8	FI	--	4	1
FR	14.7	8	6	SE	7.1	6	2
HR	8.4	2	2	NO	12.4	6	0
IT	4.8	21	0	CH	5.2	7	0
LT	3.8	1	1	RS	11.2	1	3
HU	9.0	3	5	UK	3.1	12	0

-- = Could not be calculated.

Definition of the indicator

Numerator: Number of public-private co-authored research publications. The definition of the "private sector" excludes the private medical and health sector

Denominator: Total population

Rationale: This indicator captures public-private research linkages and active collaboration activities between business sector researchers and public sector researchers resulting in academic publications

Missing data: none

Top 40 regions

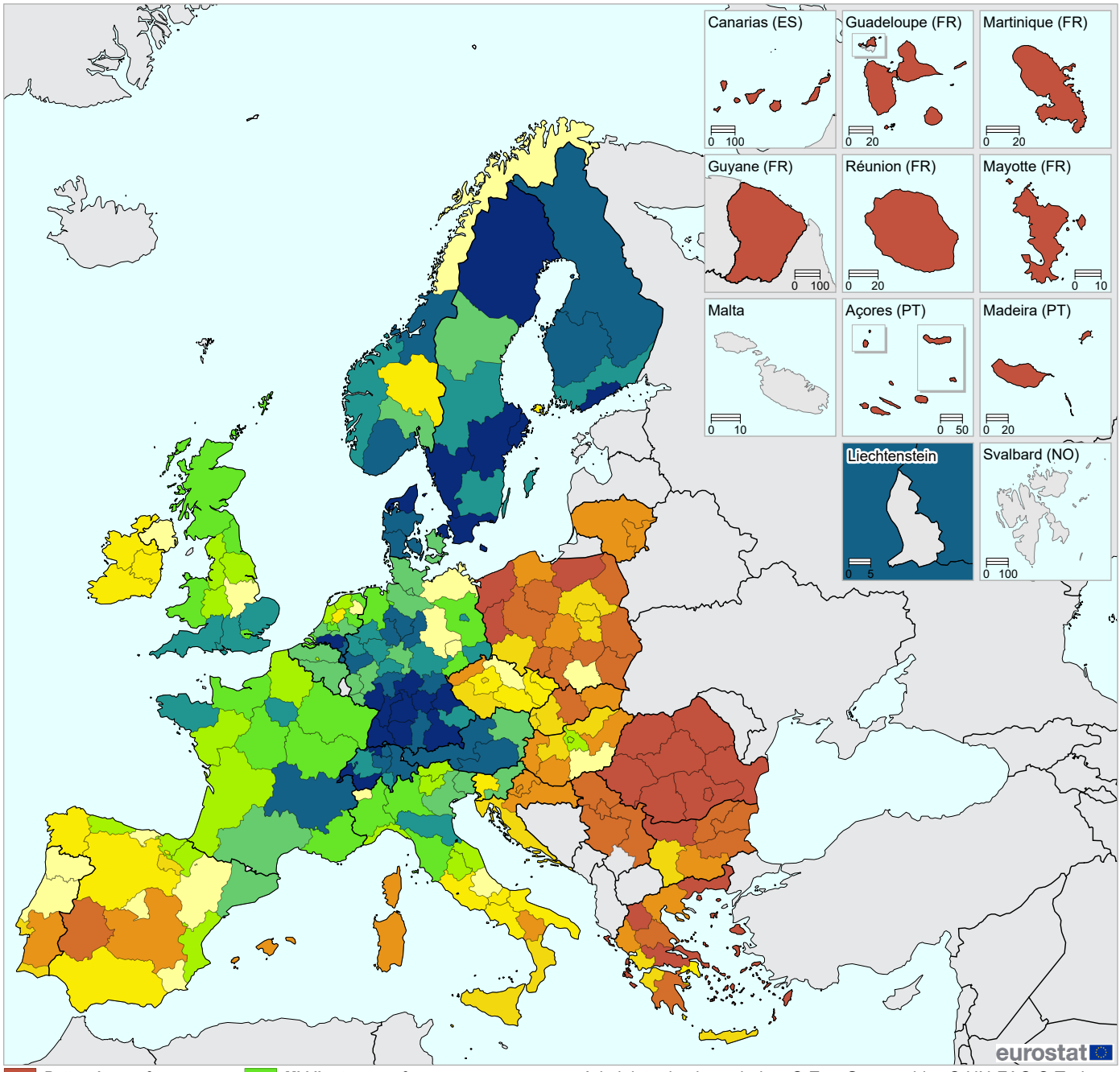
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	138.5
1	Trøndelag (NO06)	255.0	2809.4
2	Nordwestschweiz (CH03)	255.0	1787.8
3	Zürich (CH04)	255.0	1627.8
4	Hovedstaden (DK01)	255.0	1460.4
5	Région lémanique (CH01)	255.0	1270.2
6	Groningen (NL11)	255.0	1213.2
7	Helsinki-Uusimaa (FI1B)	255.0	1067.2
8	Utrecht (NL31)	255.0	941.7
9	Stockholm (SE11)	255.0	910.5
10	Leipzig (DED5)	255.0	903.9
11	Oberbayern (DE21)	254.4	896.1
12	Berlin (DE3)	253.6	890.8
13	Nordjylland (DK05)	251.9	878.8
14	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	250.5	869.2
15	Praha (CZ01)	249.9	864.8
16	Karlsruhe (DE12)	246.5	841.2
17	Oslo og Viken (NO08)	243.8	823.2
18	Östra Mellansverige (SE12)	243.7	822.4
19	Övre Norrland (SE33)	242.2	812.6
20	Hamburg (DE6)	238.7	789.1
21	Midtjylland (DK04)	238.1	785.5
22	Västsverige (SE23)	237.6	782.2
23	Grad Zagreb (HR05)	237.5	781.1
24	Provincia Autonoma Bolzano/Bozen (ITH1)	236.9	777.3
25	Tübingen (DE14)	235.9	770.8
26	Südösterreich (AT2)	235.5	768.1
27	Ticino (CH07)	233.1	752.5
28	Bremen (DE5)	232.6	749.5
29	Mittelfranken (DE25)	231.7	743.3
30	London (UKI)	229.4	728.6
31	Braunschweig (DE91)	228.6	723.9
32	Zuid-Holland (NL33)	227.5	716.8
33	Noord-Holland (NL32)	223.2	690.1
34	Dresden (DED2)	220.0	670.1
35	Zahodna Slovenija (SI04)	215.9	645.8
36	Espace Mittelland (CH02)	212.8	627.0
37	Gelderland (NL22)	212.3	624.0
38	Provincia Autonoma Trento (ITH2)	211.8	621.1
39	Ostösterreich (AT1)	211.7	620.7
40	Budapest (HU11)	211.5	619.9

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

PCT patent applications per billion regional GDP



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

PCT patent applications per billion regional GDP

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Only nine regions have at least one region included, with most regions from Germany (16), Sweden (5), Switzerland (5), Denmark (4), and Finland (2). The best performing region is *Noord-Brabant* (NL41), followed by *Sydsverige* (SE22), Oberbayern (DE21), *Mittelfranken* (DE25) and *Stuttgart* (DE11).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 6.1 times higher than the worst performing region. In several countries this ratio is much higher, particularly in France and the Netherlands, where this ratio is above 20.

In total 67 regions perform above the EU average and 172 regions perform below the EU average., with performance on this indicator being skewed leading to a relatively high EU average. In Austria, Sweden, and Switzerland, all regions perform above the EU average. In Bulgaria, Croatia, Czechia, Greece, Hungary, Ireland, Lithuania, Poland, Portugal, Romania, Serbia, Slovakia, and Spain, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	6.1	67	172				
BE	2.0	1	2	NL	20.8	3	9
BG	9.2	0	6	AT	1.7	3	0
CZ	3.1	0	8	PL	7.1	0	17
DK	2.8	4	1	PT	10.8	0	7
DE	8.9	25	13	RO	5.5	0	8
IE	1.0	0	3	SI	3.6	1	1
EL	--	0	13	SK	2.0	0	4
ES	--	0	19	FI	9.4	4	1
FR	25.8	3	11	SE	3.6	8	0
HR	1.2	0	4	NO	8.3	3	3
IT	9.0	2	19	CH	1.9	7	0
LT	1.0	0	2	RS	1.0	0	4
HU	4.0	0	8	UK	3.1	3	9

-- = Could not be calculated.

Definition of the indicator

Numerator: Number of patents applied for at the European Patent Office (EPO), by year of filing. The regional distribution of the patent applications is assigned according to the address of the inventor

Denominator: Gross Domestic Product in Purchasing Power Standard

Rationale: The capacity of firms to develop new products determines their competitive advantage. One indicator of the rate of new product innovation is the number of patents

Missing data: none

Top 40 regions

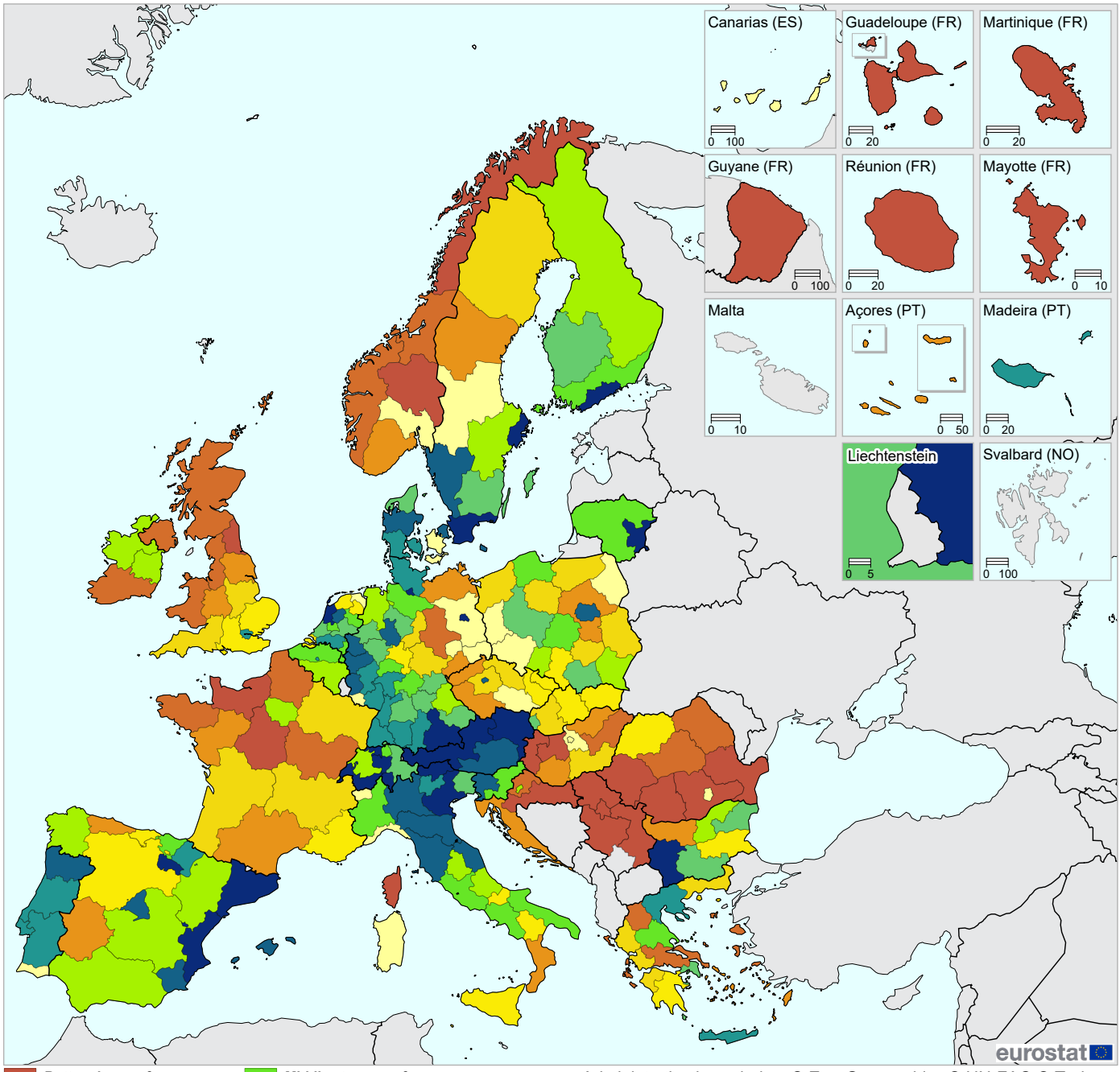
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	3.2
1	Noord-Brabant (NL41)	162.3	15.3
2	Sydsverige (SE22)	162.3	11.8
3	Oberbayern (DE21)	162.3	10.5
4	Mittelfranken (DE25)	162.3	10.5
5	Stuttgart (DE11)	162.3	10.0
6	Stockholm (SE11)	162.3	9.9
7	Nordwestschweiz (CH03)	162.3	9.2
8	Tübingen (DE14)	162.3	9.1
9	Helsinki-Uusimaa (FI1B)	162.3	8.7
10	Oberpfalz (DE23)	162.1	8.5
11	Östra Mellansverige (SE12)	161.5	8.5
12	Västsverige (SE23)	159.6	8.3
13	Freiburg (DE13)	158.8	8.2
14	Rheinhessen-Pfalz (DEB3)	158.6	8.2
15	Karlsruhe (DE12)	157.2	8.0
16	Nordjylland (DK05)	156.8	8.0
17	Région lémanique (CH01)	149.0	7.2
18	Hovedstaden (DK01)	139.6	6.3
19	Unterfranken (DE26)	139.6	6.3
20	Övre Norrland (SE33)	139.0	6.3
21	Midtjylland (DK04)	138.8	6.2
22	Agder og Sør-Østlandet (NO09)	137.5	6.1
23	Zürich (CH04)	137.1	6.1
24	Trøndelag (NO06)	136.0	6.0
25	Oberfranken (DE24)	135.9	6.0
26	Pohjois- ja Itä-Suomi (FI1D)	135.8	6.0
27	Braunschweig (DE91)	132.3	5.7
28	Schwaben (DE27)	132.0	5.6
29	Länsi-Suomi (FI19)	132.0	5.6
30	Ostschweiz (CH05)	131.8	5.6
31	Zentralschweiz (CH06)	131.3	5.6
32	Westösterreich (AT3)	131.1	5.6
33	Köln (DEA2)	130.6	5.5
34	Detmold (DEA4)	129.3	5.4
35	Auvergne - Rhône-Alpes (FRK)	128.3	5.3
36	Limburg (NL42)	128.0	5.3
37	Darmstadt (DE71)	128.0	5.3
38	Syddanmark (DK03)	127.2	5.2
39	Südösterreich (AT2)	126.7	5.2
40	Hannover (DE92)	126.6	5.2

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Trademark applications per billion regional GDP



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Trademark applications per billion regional GDP

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Regions from 15 countries are included, with most regions from Germany (7), Italy (6), Spain (6), Switzerland (4), Austria (all 3), and Sweden (3). The best performing region is *Zentralschweiz* (CH06), followed by *Berlin* (DE3), *Sostines regionas* (LT01), and *Ticino* (CH07).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 5.2 times higher than the worst performing region. In France this ratio is much higher.

In total 70 regions perform above the EU average and 169 regions perform below the EU average, with performance on this indicator being skewed leading to a relatively high EU average. Only in Austria, all regions perform above the EU average. In Croatia, France, Hungary, Ireland, Norway, Romania, Serbia, and Slovakia, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	5.2	70	169				
BE	1.4	1	2	NL	3.0	5	7
BG	4.4	2	4	AT	1.3	3	0
CZ	3.5	1	7	PL	3.3	2	15
DK	2.4	3	2	PT	3.1	5	2
DE	7.9	19	19	RO	4.8	0	8
IE	2.6	0	3	SI	1.6	1	1
EL	3.7	3	10	SK	2.1	0	4
ES	9.7	7	12	FI	2.4	1	4
FR	45.7	0	14	SE	5.1	3	5
HR	3.2	0	4	NO	4.3	0	6
IT	3.6	7	14	CH	3.9	5	2
LT	2.5	1	1	RS	1.7	0	4
HU	3.2	0	8	UK	4.3	1	11

Definition of the indicator

Numerator: Number of trademarks applied for at EUIPO

Denominator: Gross Domestic Product in Purchasing Power Standard

Rationale: Trademarks are an important innovation indicator, especially for the service sector. The Community trademark gives its proprietor a uniform right applicable in all Member States of the EU through a single procedure which simplifies trademark policies at European level

Missing data: none

Top 40 regions

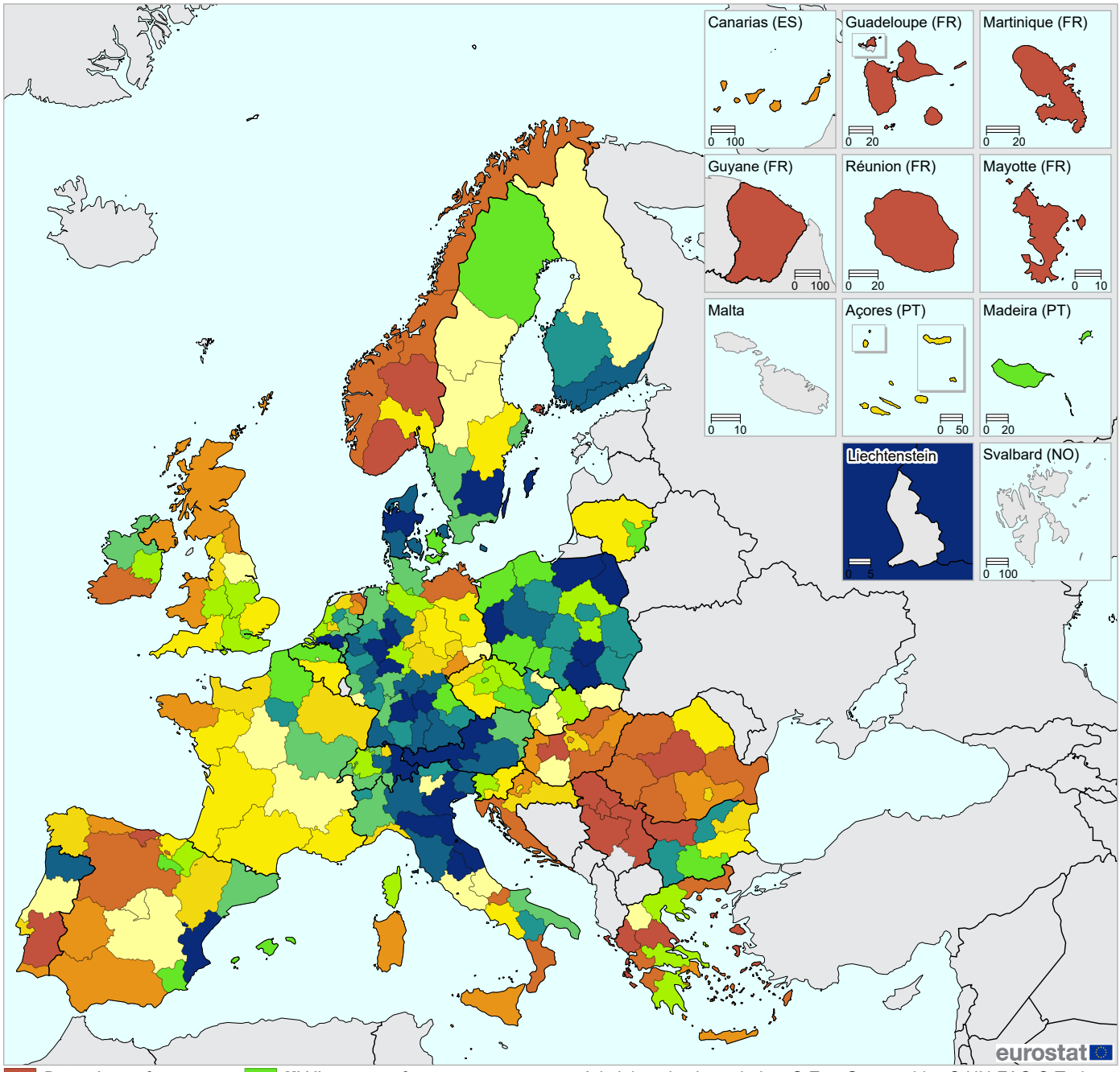
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	7.4
		100	7.4
1	Zentralschweiz (CH06)	200.5	22.9
2	Berlin (DE3)	200.5	16.7
3	Sostines regionas (LT01)	200.5	16.3
4	Ticino (CH07)	200.5	16.3
5	Hamburg (DE6)	200.5	15.2
6	Stockholm (SE11)	200.5	15.1
7	Comunitat Valenciana (ES52)	185.0	13.6
8	Helsinki-Uusimaa (FI1B)	184.7	13.6
9	Nordwestschweiz (CH03)	175.9	12.9
10	Ostösterreich (AT1)	175.7	12.9
11	Westösterreich (AT3)	175.5	12.9
12	Oberbayern (DE21)	166.7	12.2
13	Yugozapaden (BG41)	165.2	12.1
14	Noord-Holland (NL32)	164.5	12.1
15	Cataluña (ES51)	163.7	12.0
16	Sydsverige (SE22)	163.3	12.0
17	La Rioja (ES23)	158.5	11.7
18	Veneto (ITH3)	156.9	11.5
19	Région lémanique (CH01)	150.4	11.1
20	Provincia Autonoma Bolzano/Bozen (ITH1)	149.8	11.0
21	Midtjylland (DK04)	147.5	10.8
22	Illes Balears (ES53)	147.3	10.8
23	Región de Murcia (ES62)	146.5	10.8
24	Zahodna Slovenija (SI04)	146.2	10.7
25	Hovedstaden (DK01)	145.6	10.7
26	Düsseldorf (DEA1)	145.0	10.7
27	Norte (PT11)	140.7	10.3
28	Comunidad de Madrid (ES3)	140.7	10.3
29	Köln (DEA2)	140.7	10.3
30	Lombardia (ITC4)	140.0	10.3
31	Toscana (ITI1)	135.9	10.0
32	Warszawski stoleczny (PL91)	133.4	9.8
33	Detmold (DEA4)	131.7	9.7
34	Südösterreich (AT2)	131.3	9.7
35	Flevoland (NL23)	130.6	9.6
36	Praha (CZ01)	129.9	9.6
37	Emilia-Romagna (ITH5)	128.8	9.5
38	Västsverige (SE23)	128.8	9.5
39	Marche (ITI3)	124.5	9.2
40	Trier (DEB2)	123.2	9.1

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Design applications per billion regional GDP



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Design applications per billion regional GDP

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. Regions from 12 countries are included, with most regions from Germany (13), Italy (7), Poland (5), and Denmark (4). The best performing region is *Zentralschweiz* (CH06), followed by *Berlin* (DE3), *Sostines regionas* (LT01), and Ticino (CH07). The best performing region is *Ostschweiz* (CH05), followed by *Noord-Brabant* (NL41).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 19.8 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Bulgaria, France, and Portugal.

In total 71 regions perform above the EU average and 168 regions perform below the EU average., with performance on this indicator being skewed leading to a relatively high EU average. Only in Austria, all regions perform above the EU average. In Belgium, Croatia, Greece, Hungary, Ireland, Lithuania, Norway, Romania, Serbia, Slovakia, Slovenia, and the United Kingdom, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	19.8	71	168				
BE	2.2	0	3	NL	29.5	5	7
BG	42.1	2	4	AT	2.9	3	0
CZ	5.2	1	7	PL	4.4	12	5
DK	3.2	4	1	PT	112.4	1	6
DE	23.4	19	19	RO	6.9	0	8
IE	7.1	0	3	SI	1.4	0	2
EL	--	0	13	SK	2.1	0	4
ES	--	2	17	FI	--	3	2
FR	94.3	1	13	SE	7.3	4	4
HR	2.4	0	4	NO	--	0	6
IT	28.1	10	11	CH	23.9	4	3
LT	2.1	0	2	RS	--	0	4
HU	9.9	0	8	UK	4.1	0	12

-- = Could not be calculated.

Definition of the indicator

Numerator: Number of designs applied for at EUIPO

Denominator: Gross Domestic Product in Purchasing Power Standard

Rationale: A design is the outward appearance of a product or part of it resulting from the lines, contours, colours, shape, texture, materials and/or its ornamentation. A product can be any industrial or handicraft item including packaging, graphic symbols and typographic typefaces but excluding computer programs. It also includes products that are composed of multiple components, which may be disassembled and reassembled

Missing data: none

Top 40 regions

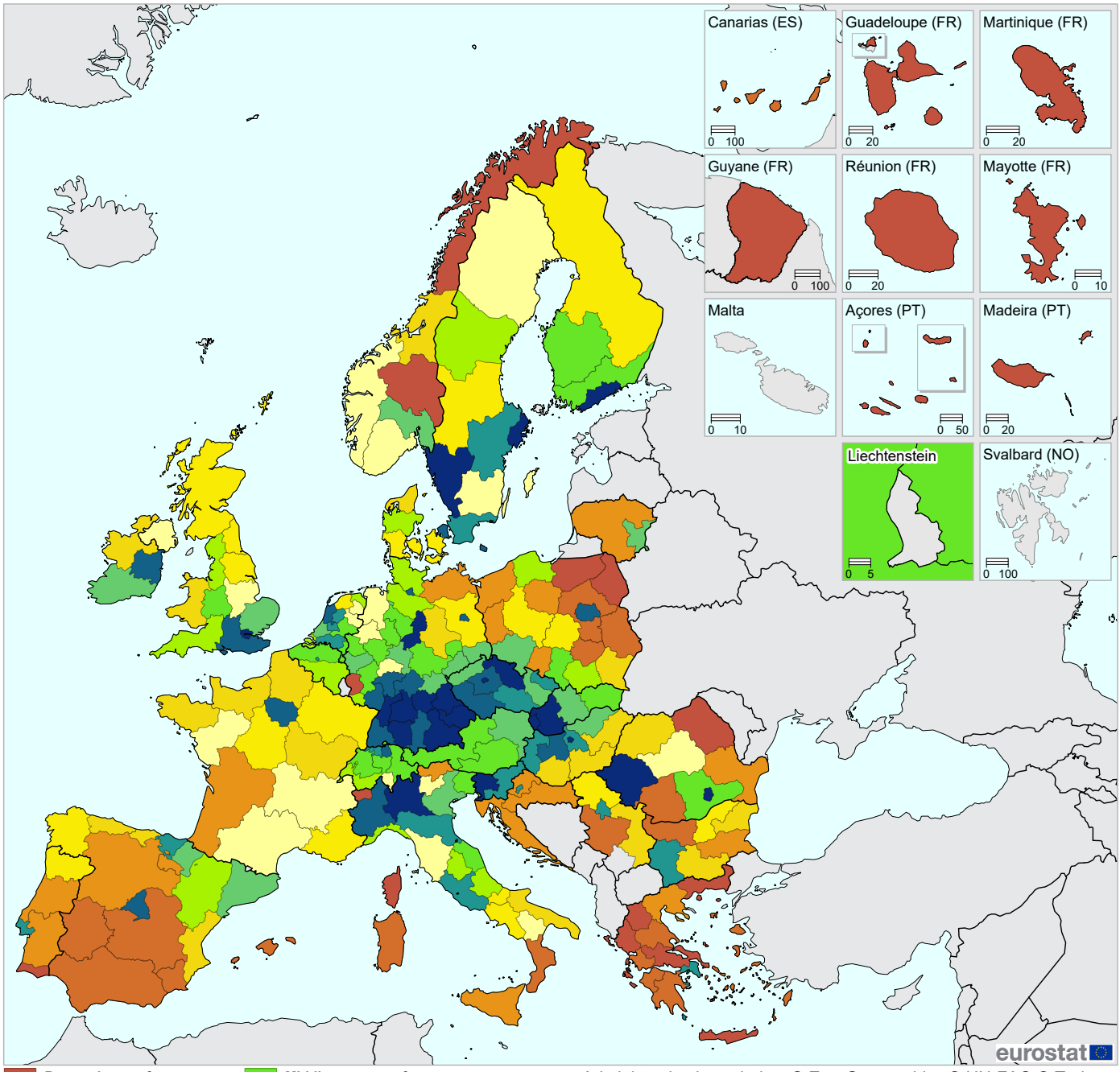
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	4.0
1	Ostschweiz (CH05)	172.3	24.6
2	Noord-Brabant (NL41)	172.3	14.8
3	Umbria (ITI2)	172.3	13.5
4	Marche (ITI3)	172.3	13.4
5	Gießen (DE72)	172.3	12.2
6	Veneto (ITH3)	172.1	11.8
7	Westösterreich (AT3)	170.9	11.6
8	Malopolskie (PL21)	167.2	11.1
9	Midtjylland (DK04)	167.0	11.1
10	Stuttgart (DE11)	160.1	10.2
11	Detmold (DEA4)	159.3	10.1
12	Arnsberg (DEA5)	158.6	10.0
13	Swietokrzyskie (PL72)	156.1	9.7
14	Småland med öarna (SE21)	153.6	9.4
15	Mittelfranken (DE25)	152.6	9.3
16	Lubuskie (PL43)	150.3	9.0
17	Podlaskie (PL84)	149.3	8.9
18	Comunitat Valenciana (ES52)	145.8	8.5
19	Emilia-Romagna (ITH5)	143.8	8.2
20	Warminsko-Mazurskie (PL62)	140.9	7.9
21	Hovedstaden (DK01)	140.6	7.9
22	Wielkopolskie (PL41)	139.2	7.7
23	Norte (PT11)	137.8	7.5
24	Lombardia (ITC4)	137.0	7.5
25	Friuli-Venezia Giulia (ITH4)	136.4	7.4
26	Koblenz (DEB1)	134.8	7.2
27	Südösterreich (AT2)	133.9	7.1
28	Zentralschweiz (CH06)	132.8	7.0
29	Hannover (DE92)	132.1	6.9
30	Oberbayern (DE21)	131.8	6.9
31	Oberfranken (DE24)	131.6	6.9
32	Freiburg (DE13)	130.0	6.7
33	Nordjylland (DK05)	128.6	6.6
34	Unterfranken (DE26)	127.5	6.5
35	Syddanmark (DK03)	123.8	6.1
36	Helsinki-Uusimaa (FI1B)	121.4	5.9
37	Etelä-Suomi (FI1C)	121.3	5.9
38	Düsseldorf (DEA1)	121.1	5.8
39	Toscana (ITI1)	120.2	5.7
40	Schwaben (DE27)	120.2	5.7

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Employment in knowledge-intensive activities as percentage of total employment



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Employment in knowledge-intensive activities as percentage of total employment

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. These regions are spread across Europe including regions from as many as 18 countries. Most regions are in Germany (15), Czechia (4), Italy (2), Hungary (2), Italy (2), Slovakia (2), Sweden (2) and the United Kingdom (2). The best performing region is *Stuttgart* (DE11), followed by *Stockholm* (SE11) and *Budapest* (HU11).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 2.7 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Germany, Greece, and Portugal, where this ratio is above 3.

In total 89 regions perform above the EU average and 149 regions perform below the EU average. In Czechia and Slovenia, all regions perform above the EU average. There is no country where all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	2.7	89	149				
BE	1.3	2	1	NL	1.7	6	6
BG	2.3	1	5	AT	1.1	1	2
CZ	1.5	8	0	PL	3.8	3	14
DK	1.9	1	4	PT	5.5	1	6
DE	5.9	25	13	RO	4.0	2	6
IE	1.9	2	1	SI	1.2	2	0
EL	5.1	1	12	SK	1.5	3	1
ES	3.3	4	15	FI	1.9	1	3
FR	3.6	1	13	SE	2.4	4	4
HR	2.2	1	3	NO	4.1	1	5
IT	3.8	5	16	CH	1.5	4	3
LT	1.8	1	1	RS	2.3	1	3
HU	2.5	5	3	UK	2.0	3	9

Definition of the alternative indicator

Numerator: Number of employed persons in the medium-high and high--tech manufacturing sectors

Denominator: Total workforce including all manufacturing and service sectors

Rationale: The share of employment in high technology manufacturing sectors is an indicator of the manufacturing economy that is based on continual innovation through creative, inventive activity. Knowledge-intensive services can be provided directly to consumers, such as telecommunications, and provide inputs to the innovative activities of other firms, which increase productivity throughout the economy and support the diffusion of a range of innovations, in particular those based on ICT

Missing data: Åland (FI2)

Top 40 regions

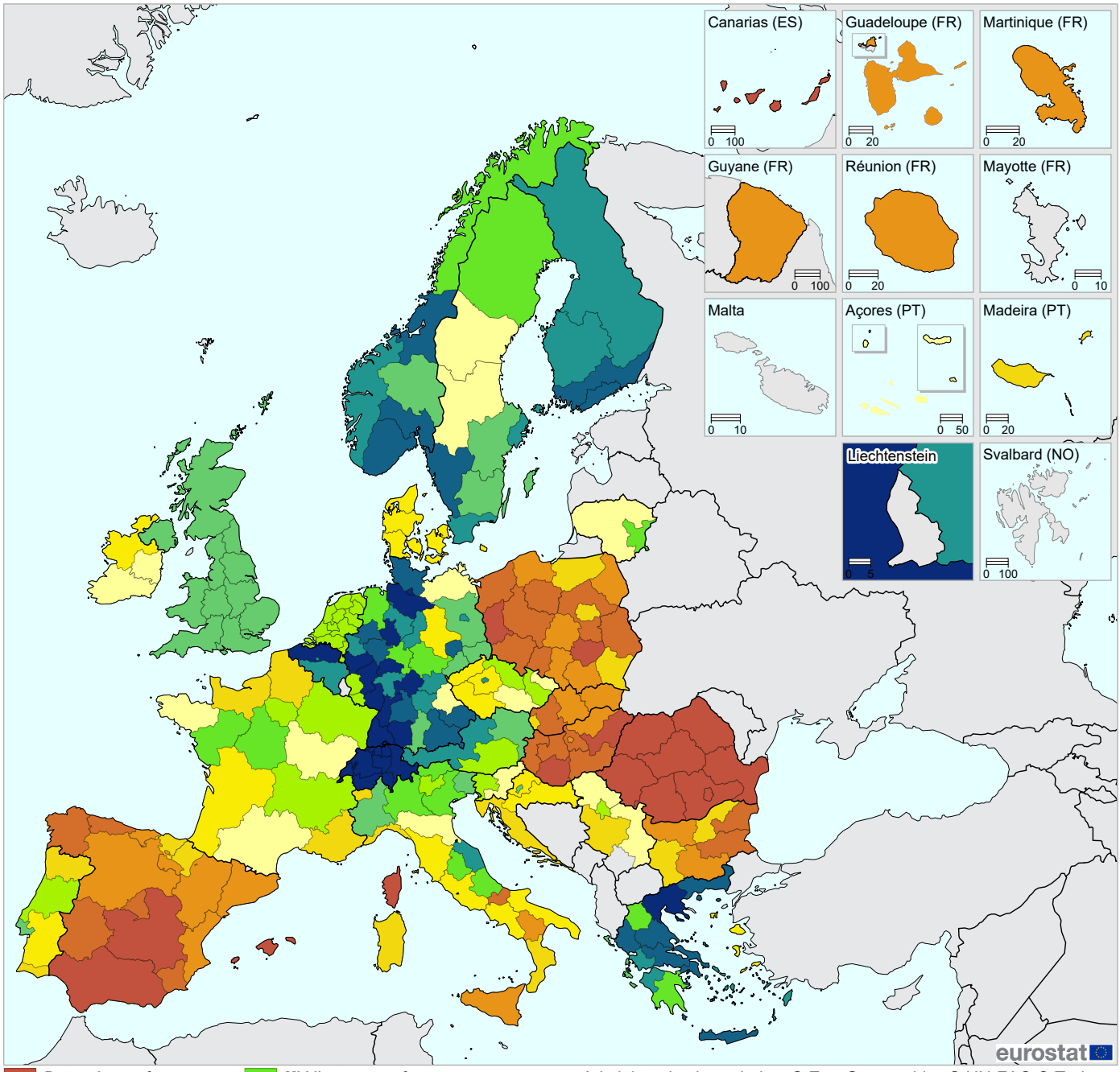
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	16.2
1	Stuttgart (DE11)	175.8	30.2
2	Stockholm (SE11)	175.8	29.2
3	Budapest (HU11)	175.8	28.3
4	Oberbayern (DE21)	175.8	26.8
5	Praha (CZ01)	175.8	26.7
6	Braunschweig (DE91)	175.8	26.6
7	Karlsruhe (DE12)	175.8	25.3
8	Tübingen (DE14)	165.8	24.1
9	Vest (RO42)	165.8	24.1
10	Západné Slovensko (SK02)	161.7	23.6
11	Bratislavský kraj (SK01)	160.8	23.5
12	Helsinki-Uusimaa (FI1B)	160.0	23.4
13	Oberpfalz (DE23)	159.2	23.3
14	Severovýchod (CZ05)	158.3	23.2
15	Zahodna Slovenija (SI04)	156.7	23.0
16	London (UKI)	153.3	22.6
17	Bucuresti - Ilfov (RO32)	150.0	22.2
18	Niederbayern (DE22)	148.3	22.0
19	Mittelfranken (DE25)	148.3	22.0
20	Lombardia (ITC4)	147.5	21.9
21	Västsverige (SE23)	147.5	21.9
22	Eastern and Midland (IE06)	146.7	21.8
23	Hamburg (DE6)	146.7	21.8
24	Zürich (CH04)	146.7	21.8
25	Île de France (FR1)	145.8	21.7
26	Noord-Holland (NL32)	145.0	21.6
27	Střední Čechy (CZ02)	145.0	21.6
28	Warszawski stołeczny (PL91)	143.3	21.4
29	Berlin (DE3)	143.3	21.4
30	Hovedstaden (DK01)	140.0	21.0
31	Piemonte (ITC1)	140.0	21.0
32	Rheinhessen-Pfalz (DEB3)	140.0	21.0
33	Közép-Dunántúl (HU21)	139.2	20.9
34	Comunidad de Madrid (ES3)	136.7	20.6
35	Darmstadt (DE71)	135.8	20.5
36	Freiburg (DE13)	135.8	20.5
37	Schwaben (DE27)	135.8	20.5
38	Jihozápad (CZ03)	134.2	20.3
39	South East (UKJ)	134.2	20.3
40	Unterfranken (DE26)	134.2	20.3

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

Employment in innovative SMEs as percentage of total employment



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Employment in innovative SMEs as percentage of total employment

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. The majority of these regions are located in only three countries: Germany (19), Greece (7), and Switzerland (all 7 regions as they share the same indicator value for Switzerland due to missing regional data). Eight German regions are included in the top-10, and the overall best performing regions are *Hamburg* (DE6), *Koblenz* (DEB1), and *Lüneburg* (DE93).

As shown in the second column in the table below, regional performance within each country is quite equally distributed. On average, the best performing region performs only 1.5 times higher than the worst performing region. In several countries this ratio is higher, particularly in France and Romania.

In total 146 regions perform above the EU average and 93 regions perform below the EU average. In Austria, Belgium, Finland, Germany, Lithuania, the Netherlands, Norway, Slovenia, Sweden, Switzerland, and the United Kingdom, all regions perform above the EU average. In Bulgaria, Denmark, Hungary, Poland, Romania, Slovakia, and Spain, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	1.5	146	93				
BE	1.1	3	0	NL	1.0	12	0
BG	1.2	0	6	AT	1.1	3	0
CZ	1.2	7	1	PL	2.0	0	17
DK	1.0	0	5	PT	1.4	3	4
DE	1.5	38	0	RO	6.4	0	8
IE	1.1	2	1	SI	1.0	2	0
EL	1.5	12	1	SK	1.2	0	4
ES	--	0	19	FI	1.1	5	0
FR	3.0	8	6	SE	1.2	8	0
HR	1.3	2	2	NO	1.1	6	0
IT	1.8	11	10	CH	1.0	7	0
LT	1.0	2	0	RS	1.2	3	1
HU	1.4	0	8	UK	1.0	12	0

-- = Could not be calculated.

Definition of the indicator

Numerator: Total employed persons in innovative enterprises with 10 or more employees

Denominator: Total employment for enterprises with 10 or more employees

Rationale: Innovation in enterprises has a profound impact on the employability of workers. Firm innovation proves to be specifically important during a time of economic recession. Although high-skilled employees are less affected by a recession than low-skilled employees, a notable positive effect is observed for low-skilled employees in innovative firms as well

Note: for all regions in Denmark, the Netherlands, Slovenia and the United Kingdom, there are no regional data and the result for the country has been used for all regions in the country

Missing data: none

Top 40 regions

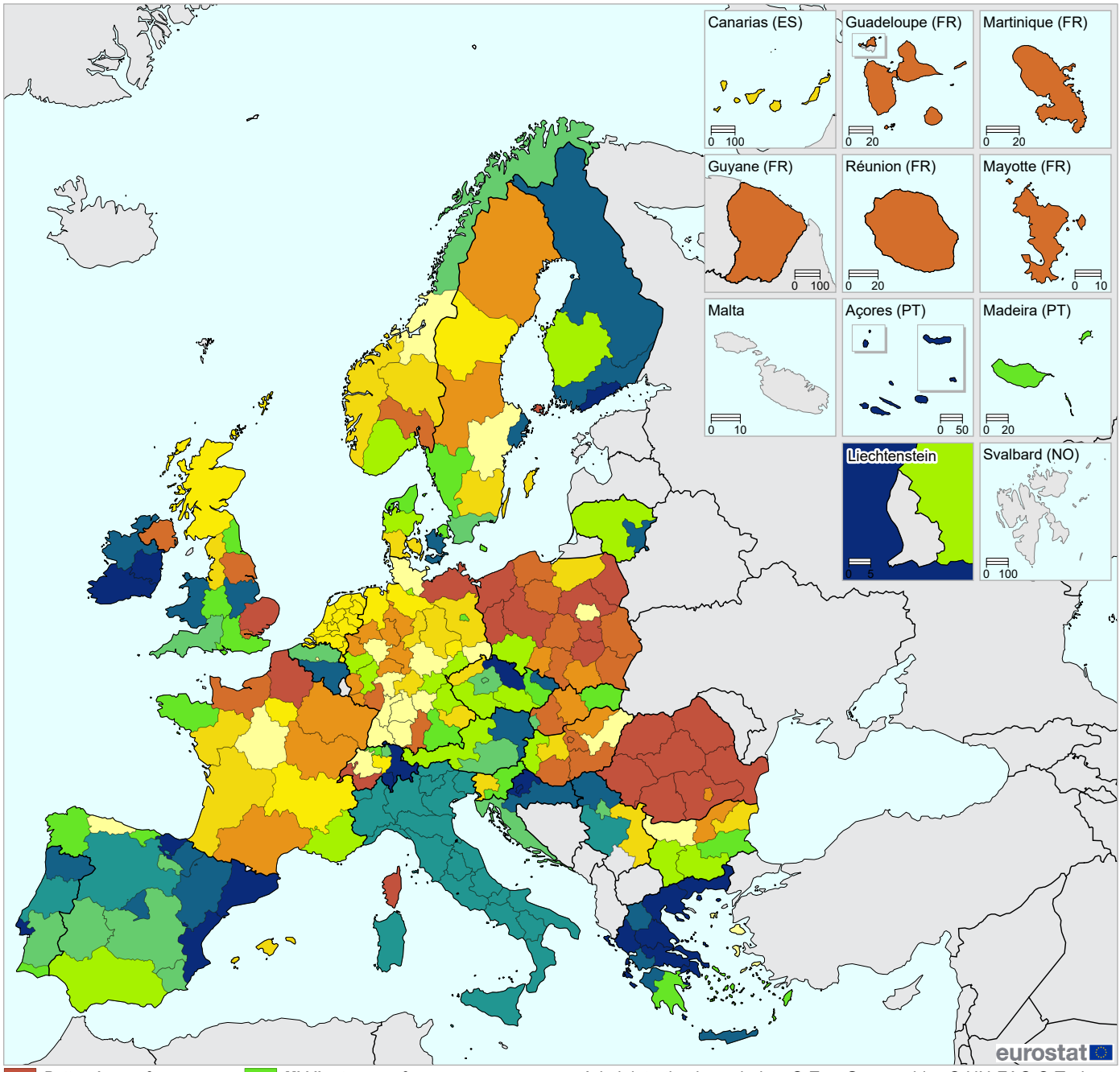
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	59.3
1	Hamburg (DE6)	174.3	c
2	Koblenz (DEB1)	174.3	c
3	Lüneburg (DE93)	169.0	c
4	Gießen (DE72)	163.7	c
5	Köln (DEA2)	163.0	c
6	Karlsruhe (DE12)	162.5	c
7	Kentriki Makedonia (EL52)	159.9	c
8	Unterfranken (DE26)	156.4	c
9	Vlaams Gewest (BE2)	154.9	c
10	Tübingen (DE14)	153.2	c
11	Rheinhessen-Pfalz (DEB3)	150.3	c
12	Freiburg (DE13)	148.7	c
13	Detmold (DEA4)	147.9	c
14	Espace Mittelland (CH02)	147.9	c
	Nordwestschweiz (CH03)		
	Ostschweiz (CH05)		
	Région lémanique (CH01)		
	Ticino (CH07)		
	Zentralschweiz (CH06)		
	Zürich (CH04)		
21	Oberbayern (DE21)	146.5	c
22	Anatoliki Makedonia, Thraki (EL51)	146.3	c
23	Schleswig-Holstein (DEF)	145.5	c
24	Stuttgart (DE11)	145.4	c
25	Attiki (EL3)	144.8	c
26	Thessalia (EL61)	143.7	c
27	Kriti (EL43)	143.4	c
28	Sterea Ellada (EL64)	143.1	c
29	Ipeiros (EL54)	142.6	c
30	Bremen (DE5)	141.8	c
31	Niederbayern (DE22)	140.1	c
32	Helsinki-Uusimaa (FI1B)	140.1	c
33	Arnsberg (DEA5)	139.0	c
34	Trøndelag (NO06)	138.8	c
35	Västsverige (SE23)	138.5	c
36	Leipzig (DED5)	138.1	c
37	Agder og Sør-Østlandet (NO09)	137.6	c
38	Oslo og Viken (NO08)	137.5	c
39	Münster (DEA3)	137.1	c
40	Etelä-Suomi (FI1C)	136.7	c

c = confidential; Note: two regions share first place based on their relative to EU score due to replacing statistical outliers.

Sales of new-to-market and new-to-enterprise innovations in SMEs as percentage of turnover



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Sales of new-to-market and new-to-enterprise innovations in SMEs as percentage of turnover

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. These regions are spread across Europe including regions from as many as 15 countries, with a strong presence from regions from Southern Europe. Most regions are in Greece (10), Spain (6), Croatia (3), Finland (3), Ireland (3), and Portugal (3). The best performing region is *Ipeiros* (EL54), followed by *Sterea Ellada* (EL64), and *Eastern and Midland* (IE06).

As shown in the second column in the table below, regional performance within each country is unequally distributed. On average, the best performing region performs 3.8 times higher than the worst performing region. In several countries this ratio is much higher, particularly in Finland, France, Romania, and the United Kingdom.

In total 98 regions perform above the EU average and 141 regions perform below the EU average. In Croatia, Ireland, Italy and Portugal, all regions perform above the EU average. In Bulgaria, Hungary, the Netherlands, Poland, and Romania, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	3.8	98	141				
BE	1.9	2	1	NL	1.0	0	12
BG	1.9	0	6	AT	1.5	2	1
CZ	2.4	5	3	PL	5.7	0	17
DK	2.2	3	2	PT	1.6	7	0
DE	3.7	2	36	RO	10.9	0	8
IE	1.7	3	0	SI	1.6	1	1
EL	3.5	11	2	SK	2.3	2	2
ES	3.7	13	6	FI	13.5	3	2
FR	9.4	1	13	SE	2.7	3	5
HR	1.5	4	0	NO	2.5	1	5
IT	1.0	21	0	CH	6.9	4	3
LT	1.6	1	1	RS	2.2	3	1
HU	2.1	0	8	UK	10.8	6	6

Definition of the indicator

Numerator: Sum of total turnover of new or significantly improved products for SMEs

Denominator: Total turnover for SMEs

Rationale: This indicator measures the turnover of new or significantly improved products and includes both products which are only new to the firm and products which are also new to the market. The indicator thus captures both the creation of state-of-the-art technologies (new to market products) and the diffusion of these technologies (new to enterprise products)

Missing data: none

Top 40 regions

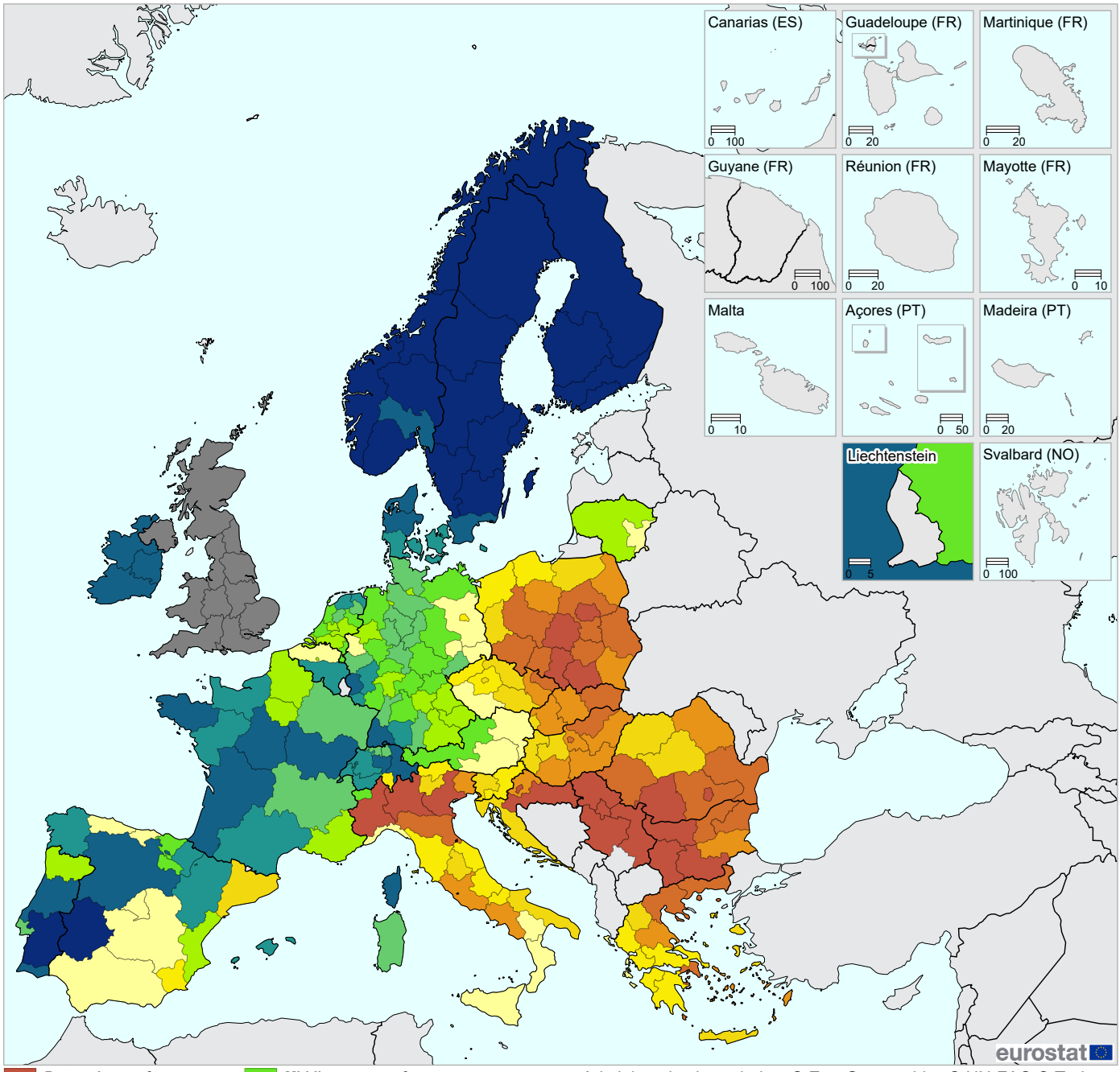
*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	8.2
1	Ipeiros (EL54)	208.1	c
2	Sterea Ellada (EL64)	208.1	c
3	Eastern and Midland (IE06)	208.1	c
4	Ostschweiz (CH05)	208.1	c
5	Southern (IE05)	208.1	c
6	País Vasco (ES21)	189.9	c
7	Grad Zagreb (HR05)	186.8	c
8	Attiki (EL3)	184.3	c
9	Ionia Nisia (EL62)	178.9	c
10	Sjeverna Hrvatska (HR06)	174.5	c
11	Ticino (CH07)	174.2	c
12	Helsinki-Uusimaa (FI1B)	174.1	c
13	Kentriki Makedonia (EL52)	172.2	c
14	Lisboa (PT17)	167.9	c
15	Cataluña (ES51)	163.7	c
16	Thessalia (EL61)	162.9	c
17	Anatoliki Makedonia, Thraki (EL51)	160.1	c
18	Comunitat Valenciana (ES52)	159.7	c
19	Severovýchod (CZ05)	157.8	c
20	Região Autónoma dos Açores (PT2)	157.8	c
21	Dytiki Ellada (EL63)	156.8	c
22	Kriti (EL43)	155.4	c
23	East Midlands (UKF)	151.6	c
24	Région wallonne (BE3)	151.1	c
25	Sostines regionas (LT01)	150.6	c
26	Sjælland (DK02)	150.2	c
27	Aragón (ES24)	150.1	c
28	Comunidad de Madrid (ES3)	149.2	c
29	Norte (PT11)	148.6	c
30	Northern and Western (IE04)	147.9	c
31	Wales (UKL)	145.9	c
32	Panonska Hrvatska (HR02)	144.0	c
33	Ostösterreich (AT1)	143.3	c
34	Etelä-Suomi (FI1C)	142.2	c
35	Pohjois- ja Itä-Suomi (FI1D)	142.0	c
36	Comunidad Foral de Navarra (ES22)	141.8	c
37	Stockholm (SE11)	141.3	c
38	Region Vojvodine (RS12)	140.0	c
39	Moravskoslezsko (CZ08)	139.5	c
40	Dytiki Makedonia (EL53)	138.2	c

c = confidential; Note: two regions share first place based on their relative to EU score due to replacing statistical outliers.

Air emissions in fine particulates (PM2.5) in Industry



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

Source: European Commission – Regional Innovation Scoreboard 2023

Air emissions in fine particulates (PM2.5) in Industry

The map on the previous page visualizes the location of the 12 performance subgroups.

The top 40 best performing regions, based on their relative to EU performance score (3rd column), are shown on the right. In particular, regions in Northern Europe perform well, with the top-10 regions from Finland, Norway and Sweden. The top-40 includes regions from 11 countries, with most regions from Sweden (all 8), Norway (all 6 for which data are available). Finland (5) and France (5). Low population density resulting from large geographic areas help in scoring well on this particular indicator. The best performing regions are *Mellersta Norrland* (SE32), *Övre Norrland* (SE33) and *Nord-Norge* (NO07).

As shown in the second column in the table below, regional performance within each country is quite equally distributed. On average, the best performing region performs only 1.5 times higher than the worst performing region. In Italy, Spain and Sweden, this ratio is above 2.

In total 139 regions perform above the EU average and 84 regions perform below the EU average. In Austria, Belgium, Denmark, Finland, France, Germany, Ireland, the Netherlands, Norway, Portugal, Sweden, and Switzerland, all regions perform above the EU average. In Bulgaria, Croatia, Hungary, Romania, Serbia, Slovakia, and Slovenia, all regions perform below the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
All	1.5	139	84				
BE	1.3	3	0	NL	1.3	12	0
BG	1.4	0	6	AT	1.2	3	0
CZ	1.6	2	6	PL	1.9	1	16
DK	1.3	5	0	PT	1.6	5	0
DE	1.6	38	0	RO	1.6	0	8
IE	1.2	3	0	SI	1.1	0	2
EL	1.5	2	11	SK	1.2	0	4
ES	2.1	16	2	FI	1.5	5	0
FR	1.4	13	0	SE	2.6	8	0
HR	1.4	0	4	NO	1.9	6	0
IT	2.4	8	13	CH	1.4	7	0
LT	1.1	2	0	RS	1.3	0	4
HU	1.3	0	8	UK	--	--	--

-- = Could not be calculated.

Definition of the alternative indicator

Regional data are not available for this indicator. Instead, regional data have been extracted from the European Environmental Agency (EEA) on Exposure to air emissions (PM2.5)

Missing data: 16 regions including Canarias (ES7), Régions ultrapériphériques françaises (FRY), Região Autónoma dos Açores (PT2), Região Autónoma da Madeira (PT3), and all 12 UK regions

Top 40 regions

*Most recent performance in third column relative to that of the EU (=100), calculated as 100 * the normalised score of the region divided by that of the EU, after correcting for statistical outliers and normalising the data.*

Regions are ranked based on the real indicator values in the last column. The lower the indicator value, the better the performance on this indicator.

	Region	Relative to EU score	Indicator value
	European Union (EU)	100	11.22
1	Mellersta Norrland (SE32)	166.8	2.89
2	Övre Norrland (SE33)	166.8	3.00
3	Nord-Norge (NO07)	166.8	3.05
4	Innlandet (NO02)	166.8	3.10
5	Trøndelag (NO06)	165.2	3.30
6	Norra Mellansverige (SE31)	164.9	3.33
7	Pohjois- ja Itä-Suomi (FI1D)	163.1	3.56
8	Åland (FI2)	161.9	3.70
9	Länsi-Suomi (FI19)	159.5	3.99
10	Östra Mellansverige (SE12)	159.1	4.04
11	Vestlandet (NO0A)	158.8	4.08
12	Stockholm (SE11)	156.1	4.40
13	Etelä-Suomi (FI1C)	152.6	4.83
14	Agder og Sør-Østlandet (NO09)	150.4	5.10
15	Västsverige (SE23)	148.9	5.28
16	Helsinki-Uusimaa (FI1B)	148.7	5.30
17	Småland med öarna (SE21)	147.2	5.49
18	Extremadura (ES43)	145.4	5.70
19	Alentejo (PT18)	144.7	5.79
20	Algarve (PT15)	144.6	5.80
21	Oslo og Viken (NO08)	144.4	5.83
22	Northern and Western (IE04)	140.0	6.36
23	Nordjylland (DK05)	139.7	6.40
24	Centro (PT16)	137.0	6.73
25	Castilla y León (ES41)	136.8	6.74
26	Trier (DEB2)	135.6	6.90
27	Eastern and Midland (IE06)	134.1	7.08
28	Bourgogne - Franche-Comté (FRC)	133.0	7.21
29	Corse (FRM)	132.7	7.25
30	Midtjylland (DK04)	132.6	7.26
31	Sydsverige (SE22)	131.0	7.45
32	Southern (IE05)	130.7	7.49
33	Centre - Val de Loire (FRB)	130.4	7.53
34	Zentralschweiz (CH06)	129.9	7.59
35	Bretagne (FRH)	129.7	7.61
36	Nouvelle-Aquitaine (FRI)	129.4	7.64
37	Freiburg (DE13)	129.4	7.65
38	Ostschweiz (CH05)	129.4	7.65
39	Espace Mittelland (CH02)	129.3	7.66
40	Sjælland (DK02)	129.2	7.67

Note: several regions share first place based on their relative to EU score due to replacing statistical outliers.

4. RIS methodology

This chapter provides an explanation of the methodology used for calculating normalised scores and the regional innovation index, on the imputation of missing data, the definition of performance groups and sub-groups, and the contextual indicators included in the regional profiles showing socio-economic differences between regions.

4.1 Regional CIS data request

To collect regional CIS data, data requests were made by Eurostat in 2023 to National Statistical Offices of most Member States, excluding those countries for which NUTS 1 and NUTS 2 levels are identical to the country territory. Regional CIS 2020 data have been made available for 21 countries: Austria, Belgium, Bulgaria, Croatia, Czechia, Finland, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain and Sweden. Regional CIS data cover the following indicators:

- SMEs introducing product innovations as percentage share of all SMEs
- SMEs introducing business process innovations as percentage share of all SMEs
- Innovative SMEs cooperating with others as percentage share of all SMEs
- Employment in innovative SMEs as percentage of total employment in SMEs
- Non-R&D innovation expenditure by SMEs as percentage of total turnover by SMEs
- Innovation expenditure per person employed in SMEs
- Sales from product innovations new-to-market and new-to-enterprise as percentage of total turnover by SMEs

Regional CIS data are not publicly available and have been made explicitly available for the Regional Innovation Scoreboard by National Statistical Offices. The CIS assigns the innovation activities of multi-establishment enterprises to the region where the head office is located. There is a risk that regions without head offices score lower on the CIS indicators as some of the activities in these regions are assigned to those regions with head offices. To minimise this risk, the regional CIS data excludes large firms (which are more likely to have multiple establishments in different regions) and focuses on SMEs only.

4.2 Missing data: imputations

The following imputation techniques have been applied in the order as shown below.

1. At the country level, if data for both the previous and the following year are available, first the average of both years will be used $X_C^T = (X_C^{T-1} + X_C^{T+1})/2$, then, if the previous step is not possible, that of the previous year $X_C^T = X_C^{T-1}$, and finally, if the previous step is not possible, that of the following year $X_C^T = X_C^{T+1}$, where C denotes the country, T the current year, T-1 the previous year, and T+1 the following year. If data are not available for the previous and following year, missing data will not be imputed.

2. If regional data are available for the previous year, the ratio between the corresponding NUTS level and that at a higher aggregate level (NUTS 1 for NUTS 2 regions, country level for NUTS 1 regions) for the previous year is multiplied with the current value at the higher aggregate level: $X_R^T = (X_R^{T-1}/X_C^{T-1}) * X_C^T$, where R denotes the region, C the country (as the higher aggregate level), T the current year, and T-1 the previous year.

3. If regional data for the previous year are not available, the same procedure as in step 2 will be applied using the ratio between the corresponding NUTS level and that at a higher aggregate level (NUTS 1 for NUTS 2 regions, country level for NUTS 1 regions) for the following year: $X_R^T = (X_R^{T+1}/X_C^{T+1}) * X_C^T$, where R denotes the region, C the country (as the higher aggregate level), T the current year, and T+1 the following year.

4. If there are no regional data for neither the previous nor the following year, the higher-level aggregate will be used (NUTS 1 for NUTS 2 regions, country level for NUTS 1 regions), first that for the current year, and, if not available, that for the previous year, otherwise that for the following year: $X_R^T = X_C^T$ or$X_R^T = X_C^{T-1}$ or$X_R^T = X_C^{T+1}$, where R denotes the region, C the country (as the higher aggregate level), t the current year, T-1 the previous year, and T+1 the following year.

5. If no regional and no country-level data are available for the current, previous or following year, missing data will not be imputed.

The full RIS 2023 database contains 40,152 data cells (239 regions, 21 indicators, and 8 years). For almost all indicators, data are missing for several regions and different years. To improve data availability, several imputation techniques have been used to provide estimates for all missing data. Data availability after imputations for missing data equals more than 99%. The RIS 2023 Methodology Report provides more details on missing data and the imputation techniques.

4.3 Composite indicators

4.3.1 Normalising data

For the calculation of composite indicators, the individual indicators should ideally follow a normal distribution, but some indicators have an asymmetrical or skewed data distribution (where most regions show low performance levels, and a few regions show exceptionally high performance). Data have been transformed using a square root transformation if the degree of skewness of the raw data, after correcting for statistical outliers, a measure of the asymmetry of the distribution of the data, exceeds 1, such that the skewness of the transformed data is below 1. For the following indicators, the degree of skewness was above one and data have been transformed: R&D expenditures in the public sector, R&D expenditures in the business sector, Non-R&D innovation expenditures, Innovation expenditures per person employed, Public-private co-publications, PCT patent applications, and Design applications.

Following this transformation, the data are normalised using the min-max procedure. The minimum score observed for all regions across all eight years is subtracted from the respective transformed score, which is then divided by the difference between the maximum and minimum scores observed for all regions across all eight years. The maximum normalised score is equal to 1 and the minimum normalised score is equal to 0.

4.3.2 Regional Innovation Index

Average innovation performance is measured using composite indicators. The Regional Innovation Index (RII) is calculated as the unweighted average of the normalised scores of the 21 indicators.

A comparison of the Regional Innovation Index at the country level with the Summary Innovation Index in the European Innovation Scoreboard (EIS) shows that, due to using a more restricted set of indicators in the RIS, countries' performance relative to the EU average in the RIS is different from that in the EIS. The following correction is therefore applied to the composite indicator scores:

1) Calculate the ratios of the EIS 2023 innovation index at country level with that of the EU: EIS_index_CTR / EIS_index_EU

2) Calculate the ratios of the RIS 2023 innovation index at country level with that of the EU: RIS_index_CTR / RIS_index_EU

3) Calculate the correction factor by dividing the ratios 1) and 2)

These country correction factors are then multiplied with the RII for each region in the corresponding country to obtain final RII scores. Relative performance scores are calculated by dividing the RII of the region by that of the EU and multiplying by 100. For trend performance, RIIs for all years are divided by that of the EU in 2016, the first year of the 8-year period for which data are used in the RIS.

4.3.3 Timeliness of regional data

The years used in the titles of the RIS reports refer to the years in which the respective editions were published. For the RIS 2023, most recent data refer to 2022 for two indicators, 2021 for eight indicators, and 2020 for 11 indicators. The RII for 2023 should be interpreted as referring to data about two years older than the 2023 reference year.

For the RIS 2023, most recent data refer to:

- 2022 for two indicators, including: International scientific co-publications, Public-private co-publications
- 2021 for eight indicators, including: Population with tertiary education, Lifelong learning, Digital skills, Employed ICT specialists, PCT patent applications, Trademark applications, Design applications, Employment in knowledge-intensive activities
- 2020 for 11 indicators, including: Most-cited scientific publications, R&D expenditures in the public sector, R&D expenditures in the business sector, Non-R&D innovation expenditures, Innovation expenditures per person employed, SMEs with product innovations, SMEs with business process innovations, Innovative SMEs collaborating with others, Employment in innovative SMEs, Sales of new-to-market and new-to-enterprise innovations, Air emissions in fine particulates

For the RIS 2023, the database covers a period of eight years and data for all years are used to calculate regional innovation index scores. As the RIS is a biennial report, and as the one of the main data sources, the Community Innovation Survey produces new data once every two years, results are presented for only four years. Following the availability of the most recent data, the RIS 2023 presents a Regional Innovation Index (RII) for four reference years:

- RII2023 using regional CIS 2020 data and the most recent data available on 26 April 2023
- RII2021 using data two years less timely than those used for the RII2023, including regional CIS 2018 data
- RII2019 using data four years less timely than those used for the RII2023, including regional CIS 2016 data
- RII2017 using data six years less timely than those used for the RII2023, including regional CIS 2014 data

4.4 Performance group membership

For determining performance group membership, the RIS adopts the classification scheme used in the EIS. Innovation Leaders are all regions with a relative performance more than 25% above the EU average in 2023; Strong Innovators are all regions with a relative performance between 100% and 125% of the EU average in 2023; Moderate Innovators are all regions with a relative performance between 70% and 100% of the EU average in 2023; Emerging Innovators are all regions with a relative performance below 70% of the EU average in 2023.

4.5 Contextual analysis on the impact of structural differences between regions

The RIS uses structural data in the regional profiles to help users to better understand the impact of structural differences on observed scores. Brief analyses of structural differences by region are included in the regional profiles.

Differences in economic structures are relevant, with differences in the share of industry in GDP being an important factor that could explain why regions perform better or worse on indicators like business R&D expenditures, PCT patent applications and innovative enterprises. The regional profiles include for each region, when data are available from Eurostat, data on the composition of regional employment, using average employment shares for the years 2019-2021, for the following industries: Agriculture & Mining, Manufacturing, Utilities & Construction, Services, and Public administration.

Enterprise characteristics are important for explaining differences in R&D spending and innovation activities. Larger enterprises are more likely to be innovative. Regional data on the average number of employees in an enterprise are used to measure differences in enterprise size effects across regions.

Densely populated areas are also more likely to be more innovative for several reasons. First, with people and enterprises being at closer distance, knowledge diffuses more easily. Second, urbanised areas tend to have a concentration of government and educational services, which provide better training opportunities and employ above-average shares of highly educated people. Structural data also include indicators measuring the size of the regional economy, including two indicators measuring GDP per capita, both in Euros and in purchasing power standards[6] , which is a better measure for interpreting real income differences between regions.

[6] The purchasing power standard (PPS) is an artificial currency unit. Theoretically, one PPS can buy the same amount of goods and services in each country. However, price differences across borders mean that different amounts of national currency units are needed for the same goods and services depending on the country. PPS are derived by dividing any economic aggregate of a country in national currency by its respective purchasing power parities.

Annexes

Annex 1: Regions included at different NUTS levels by country

Country		Number of regions at NUTS level		Average population size (2022)	Regions (NUTS code)	
		1	2			
EU Member States						
BE	Belgium	3	--	3,872,500	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	Vlaams Gewest (BE2) Région wallonne (BE3)
BG	Bulgaria	--	6	1,139,800	Severozapaden (BG31) Severen tsentralen (BG32) Severoiztochen (BG33)	Yugoiztochen (BG34) Yugozapaden (BG41) Yuzhen tsentralen (BG42)
CZ	Czechia	-- --	8	1,314,600	Praha (CZ01) Střední Čechy (CZ02) Jihozápad (CZ03) Severozápad (CZ04)	Severovýchod (CZ05) Jihovýchod (CZ06) Střední Morava (CZ07) Moravskoslezsko (CZ08)
DK	Denmark	--	5	1,174,700	Hovedstaden (DK01) Sjælland (DK02) Syddanmark (DK03)	Midtjylland (DK04) Nordjylland (DK05)
DE	Germany	9	29	2,190,500	Stuttgart (DE11) Karlsruhe (DE12) Freiburg (DE13) Tübingen (DE14) Oberbayern (DE21) Niederbayern (DE22) Oberpfalz (DE23) Oberfranken (DE24) Mittelfranken (DE25) Unterfranken (DE26) Schwaben (DE27) Berlin (DE3) Brandenburg (DE4) Bremen (DE5) Hamburg (DE6) Darmstadt (DE71) Gießen (DE72) Kassel (DE73) Mecklenburg-Vorpommern (DE8)	Braunschweig (DE91) Hannover (DE92) Lüneburg (DE93) Weser-Ems (DE94) Düsseldorf (DEA1) Köln (DEA2) Münster (DEA3) Detmold (DEA4) Arnsberg (DEA5) Koblenz (DEB1) Trier (DEB2) Rheinhessen-Pfalz (DEB3) Saarland (DEC) Dresden (DED2) Chemnitz (DED4) Leipzig (DED5) Sachsen-Anhalt (DEE) Schleswig-Holstein (DEF) Thüringen (DEG)
IE	Ireland	--	3	1,686,700	Northern and Western (IE04) Southern (IE05)	Eastern and Midland (IE06)
EL	Greece	1	12	804,600	Attiki (EL3) Voreio Aigaio (EL41) Notio Aigaio (EL42) Kriti (EL43) Anatoliki Makedonia, Thraki (EL51) Kentriki Makedonia (EL52) Dytiki Makedonia (EL53)	Ipeiros (EL54) Thessalia (EL61) Ionia Nisia (EL62) Dytiki Ellada (EL63) Sterea Ellada (EL64) Peloponnisos (EL65)
ES	Spain	2	17	2,496,500	Galicia (ES11) Principado de Asturias (ES12) Cantabria (ES13) País Vasco (ES21) Comunidad Foral de Navarra (ES22) La Rioja (ES23) Aragón (ES24) Comunidad de Madrid (ES3) Castilla y León (ES41) Castilla-la Mancha (ES42)	Extremadura (ES43) Cataluña (ES51) Comunitat Valenciana (ES52) Illes Balears (ES53) Andalucía (ES61) Región de Murcia (ES62) Ciudad de Ceuta (ES63) Ciudad de Melilla (ES64) Canarias (ES7)

Country		Number of regions at NUTS level		Average population size (2022)	Regions (NUTS code)	
		1	2			
FR	France	14	--	4,484,000	Île de France (FR1) Centre - Val de Loire (FRB) Bourgogne - Franche-Comté (FRC) Normandie (FRD) Hauts-de-France (FRE) Grand Est (FRF) Pays de la Loire (FRG) Bretagne (FRH)	Nouvelle-Aquitaine (FRI) Occitanie (FRJ) Auvergne - Rhône-Alpes (FRK) Provence-Alpes-Côte d'Azur (FRL) Corse (FRM) RUP FR - Régions ultrapériphériques françaises (FRY)
HR	Croatia	--	4	965,600	Panonska Hrvatska (HR02) Jadranska Hrvatska (HR03)	Kontinentalna Hrvatska (HR04) Grad Zagreb (HR05)
IT	Italy	--	21	2,811,000	Piemonte (ITC1) Valle d'Aosta/Vallée d'Aoste (ITC2) Liguria (ITC3) Lombardia (ITC4) Provincia Autonoma Bolzano/Bozen (ITH1) Provincia Autonoma Trento (ITH2) Veneto (ITH3) Friuli-Venezia Giulia (ITH4) Emilia-Romagna (ITH5) Toscana (ITI1) Umbria (ITI2)	Marche (ITI3) Lazio (ITI4) Abruzzo (ITF1) Molise (ITF2) Campania (ITF3) Puglia (ITF4) Basilicata (ITF5) Calabria (ITF6) Sicilia (ITG1) Sardegna (ITG2)
LT	Lithuania	--	2	1,403,000	Sostinės regionas (LT01)	Vidurio ir vakarų Lietuvos regionas (LT02)
HU	Hungary	--	8	1,211,100	Budapest (HU11) Pest (HU12) Közép-Dunántúl (HU21) Nyugat-Dunántúl (HU22)	Dél-Dunántúl (HU23) Észak-Magyarország (HU31) Észak-Alföld (HU32) Dél-Alföld (HU33)
NL	Netherlands	--	12	1,465,900	Groningen (NL11) Friesland (NL12) Drenthe (NL13) Overijssel (NL21) Gelderland (NL22) Flevoland (NL23)	Utrecht (NL31) Noord-Holland (NL32) Zuid-Holland (NL33) Zeeland (NL34) Noord-Brabant (NL41) Limburg (NL42)
AT	Austria	3	--	2,993,000	Ostösterreich (AT1) Südösterreich (AT2)	Westösterreich (AT3)
PL	Poland	--	17	2,215,000	Małopolskie (PL21) Śląskie (PL22) Wielkopolskie (PL41) Zachodniopomorskie (PL42) Lubuskie (PL43) Dolnośląskie (PL51) Opolskie (PL52) Kujawsko-Pomorskie (PL61) Warmińsko-Mazurskie (PL62)	Pomorskie (PL63) Łódzkie (PL71) Świętokrzyskie (PL72) Lubelskie (PL81) Podkarpackie (PL82) Podlaskie (PL84) Warszawski stoleczny (PL91) Mazowiecki regionalny (PL92)
PT	Portugal	2	5	1,478,900	Norte (PT11) Algarve (PT15) Centro (PT16) Lisboa (PT17)	Alentejo (PT18) Região Autónoma dos Açores (PT2) Região Autónoma da Madeira (PT3)
RO	Romania	--	8	2,380,300	Nord-Vest (RO11) Centru (RO12) Nord-Est (RO21) Sud-Est (RO22)	Sud - Muntenia (RO31) Bucuresti - Ilfov (RO32) Sud-Vest Oltenia (RO41) Vest (RO42)
SI	Slovenia	--	2	1,053,600	Vzhodna Slovenija (SI03)	Zahodna Slovenija (SI04)

Country		Number of regions at NUTS level		Average population size (2022)	Regions (NUTS code)	
		1	2			
SK	Slovakia	--	4	1,358,700	Bratislavský kraj (SK01) Západné Slovensko (SK02)	Stredné Slovensko (SK03) Východné Slovensko (SK04)
FI	Finland	1	4	1,109,600	Helsinki-Uusimaa (FI1B) Etelä-Suomi (FI1C) Länsi-Suomi (FI19)	Pohjois- ja Itä-Suomi (FI1D) Åland (FI2)
SE	Sweden	--	8	1,306.500	Stockholm (SE11) Östra Mellansverige (SE12) Småland med öarna (SE21) Sydsverige (SE22)	Västsverige (SE23) Norra Mellansverige (SE31) Mellersta Norrland (SE32) Övre Norrland (SE33)
Non-EU countries						
NO	Norway	--	6	904.200	Innlandet (NO02) Trøndelag (NO06) Nord-Norge (NO07)	Oslo og Viken (NO08) Agder og Sør-Østlandet (NO09) Vestlandet (NO0A)
CH	Switzerland	--	7	1,248,400	Région lémanique (CH01) Espace Mittelland (CH02) Nordwestschweiz (CH03) Zürich (CH04)	Ostschweiz (CH05) Zentralschweiz (CH06) Ticino (CH07)
RS	Serbia	--	4	1,699,300	Belgrade (RS11) Vojvodina (RS12)	Šumadija and Western Serbia (RS21) Southern and Eastern Serbia (RS22)
UK	United Kingdom	12	--	5,573,000	North East (UKC) North West (UKD) Yorkshire and The Humber (UKE) East Midlands (UKF) West Midlands (UKG) East of England (UKH)	London (UKI) South East (UKJ) South West (UKK) Wales (UKL) Scotland (UKM) Northern Ireland (UKN)

Annex 2: Regional Innovation Scoreboard indicators

Percentage population aged 25-34 having completed tertiary education	
Numerator	Number of persons in age class with some form of post-secondary education
Denominator	The reference population is all age classes between 25 and 34 years inclusive
Rationale	This is a general indicator of the supply of advanced skills. It is not limited to science and technical fields, because the adoption of innovations in many areas, including the service sectors, depends on a wide range of skills. The indicator focuses on a narrow share of the population aged 25 to 34 and will relatively quickly reflect changes in educational policies leading to more tertiary graduates
Included in EIS	No, proxy for EIS indicator measuring share of population aged 25-34 having completed tertiary education
Data source	Eurostat, regional statistics
Data availability	NUTS 2: 2014 - 2021

Percentage population aged 25-64 participating in lifelong learning	
Numerator	Number of persons in private households aged between 25 and 64 years who have participated in the four weeks preceding the interview, in any education or training, whether or not relevant to the respondent's current or possible future job
Denominator	Total population aged between 25 and 64 years
Rationale	Lifelong learning encompasses all purposeful learning activity, whether formal, non-formal or informal, undertaken on an ongoing basis with the aim of improving knowledge, skills and competence. The intention or aim to learn is the critical point that distinguishes these activities from non-learning activities, such as cultural or sporting activities
Included in EIS	Yes
Data source	Eurostat, regional statistics
Data availability	NUTS 2: 2014 - 2021

International scientific co-publications per million population	
Numerator	Number of scientific publications with at least one co-author based abroad
Denominator	Total population
Rationale	International scientific co-publications are a proxy for the quality of scientific research as collaboration increases scientific productivity
Included in EIS	Yes
Data source	Numerator: Scopus. Data calculated by Science Metrix as part of a contract to the EC Denominator: Eurostat
Data availability	NUTS 2: 2015 – 2022

Scientific publications among the top-10% most cited publications worldwide	
Numerator	Number of scientific publications among the top-10% most cited publications worldwide
Denominator	Total number of scientific publications
Rationale	The indicator is a measure for the efficiency of the research system as highly cited publications are assumed to be of higher quality. There could be a bias towards small or English-speaking countries given the coverage of Scopus' publication data
Included in EIS	Yes
Data source	Scopus. Data calculated by Science Metrix as part of a contract to the EC
Data availability	NUTS 2: 2013 - 2020

Individuals who have above basic overall digital skills	
Numerator	Number of individuals with above basic overall digital skills
Denominator	Total number of individuals aged 16 to 74
Rationale	Above basic overall digital skills represents the highest level of the overall digital skills indicator, which is a composite indicator based on selected activities performed by individuals aged 16-74 on the internet in four specific areas (information, communication, problem solving, content creation) during the previous 3 months
Included in EIS	Yes
Data source	Own estimates combining EIS country level with regional data (Eurostat) on Households with broadband access
Data availability	NUTS 2: 2017 – 2021

R&D expenditures in the public sector as percentage of GDP	
Numerator	All R&D expenditures in the government sector (GOVERD) and the higher education sector (HERD)
Denominator	Regional Gross Domestic Product
Rationale	R&D expenditure represents one of the major drivers of economic growth in a knowledge-based economy. Trends in the R&D expenditure indicator provide key indications of the future competitiveness and wealth of a region. R&D spending is essential for making the transition to a knowledge-based economy as well as for improving production technologies and stimulating growth
Included in EIS	Yes
Data source	Eurostat, regional statistics
Data availability	NUTS 2: 2013 - 2020

R&D expenditures in the business sector as percentage of GDP	
Numerator	All R&D expenditures in the business sector (BERD)
Denominator	Regional Gross Domestic Product
Rationale	The indicator captures the formal creation of new knowledge within firms. It is particularly important in the science-based sector (pharmaceuticals, chemicals and some areas of electronics), where most new knowledge is created in or near R&D laboratories
Included in EIS	Yes
Data source	Eurostat, regional statistics
Data availability	NUTS 2: 2013 - 2020

Non-R&D innovation expenditures in SMEs as percentage of turnover	
Numerator	Sum of total innovation expenditure for SMEs, excluding intramural and extramural R&D expenditures
Denominator	Total turnover for SMEs
Rationale	This indicator measures non-R&D innovation expenditure as percentage of total turnover. Several of the components of innovation expenditure, such as investment in equipment and machinery and the acquisition of patents and licenses, measure the diffusion of new production technology and ideas
Included in EIS	No, proxy for EIS indicator including all enterprises
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2014, CIS 2016, CIS 2018, CIS 2020

Innovation expenditures per person employed in innovative SMEs	
Numerator	Sum of total innovation expenditure by SMEs in Purchasing Power Standards (PPS)
Denominator	Total employment in innovative SMEs
Rationale	The indicator measures the monetary input directly related to innovation activities.
Included in EIS	No, proxy for EIS indicator including all enterprises
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2014, CIS 2016, CIS 2018, CIS 2020

ICT specialists (as a percentage of total employment)	
Numerator	Number of employed ICT specialists
Denominator	Total employment
Rationale	ICT skills are particularly important for innovation in an increasingly digital economy. The share of enterprises providing training in that respect is a proxy for the overall skills development of employees.
Included in EIS	Yes
Data source	Own estimates combining EIS country level with regional data (Eurostat) on Employment in information and communication (NACE J)
Data availability	NUTS 1 and 2 for different countries for 2014 - 2021

SMEs introducing product innovations as percentage of SMEs	
Numerator	Number of Small and medium-sized enterprises (SMEs) who introduced at least one product innovation. A product innovation is the market introduction of a new or significantly improved good or service with respect to its capabilities, user friendliness, components, or sub-systems
Denominator	Total number of SMEs
Rationale	Product innovation is a key ingredient to innovation as they can create new markets and improve competitiveness. Higher shares of product innovators reflect a higher level of innovation activities
Included in EIS	Yes
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2014, CIS 2016, CIS 2018, CIS 2020

SMEs introducing business process innovations as percentage of SMEs	
Numerator	Number of Small and medium-sized enterprises (SMEs) who introduced at least one business process innovation either new to the enterprise or new to their market
Denominator	Total number of SMEs
Rationale	Many firms innovate not by improving new products but by improving their business processes. Business process innovations include process, marketing and organisational innovations.
Included in EIS	Yes
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2014, CIS 2016, CIS 2018, CIS 2020

Innovative SMEs collaborating with others as percentage of SMEs	
Numerator	Number of SMEs with innovation co-operation activities. Firms with co-operation activities are those that have had any co-operation agreements on innovation activities with other enterprises or institutions
Denominator	Total number of SMEs
Rationale	This indicator measures the degree to which SMEs are involved in innovation co-operation. Complex innovations often depend on companies' ability to draw on diverse sources of information and knowledge, or to collaborate on the development of an innovation. The indicator measures the flow of knowledge between public research institutions and firms, and between firms and other firms. The indicator is limited to SMEs, because almost all large firms are involved in innovation co-operation
Included in EIS	Yes
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2014, CIS 2016, CIS 2018, CIS 2020

Public-private co-publications per million population	
Numerator	Number of public-private co-authored research publications. The definition of the "private sector" excludes the private medical and health sector. Publications are assigned to the country/countries in which the business companies or other private sector organisations are located
Denominator	Total population
Rationale	This indicator captures public-private research linkages and active collaboration activities between business sector researchers and public sector researchers resulting in academic publications
Included in EIS	Yes
Data source	Numerator: Scopus. Data calculated by Science Metrix as part of a contract to the EC Denominator: Eurostat
Data availability	NUTS 2: 2015 – 2022

PCT patent applications per billion regional GDP	
Numerator	Number of patents applied for at the European Patent Office (EPO), by year of filing. The regional distribution of the patent applications is assigned according to the address of the inventor
Denominator	Gross Domestic Product in Purchasing Power Standard
Rationale	The capacity of firms to develop new products determines their competitive advantage. One indicator of the rate of new product innovation is the number of patent applications
Included in EIS	Yes
Data source	Numerator: OECD, REGPAT. Denominator: Eurostat
Data availability	NUTS 2: two-year averages for 2014 - 2021

Trademark applications per billion regional GDP	
Numerator	Number of trademark applications applied for at EUIPO
Denominator	Gross Domestic Product in Purchasing Power Standard
Rationale	Trademarks are an important innovation indicator, especially for the service sector. The Community trademark gives its proprietor a uniform right applicable in all Member States of the European Union through a single procedure which simplifies trademark policies at European level. It fulfils the three essential functions of a trademark: it identifies the origin of goods and services, guarantees consistent quality through evidence of the company's commitment vis-à-vis the consumer, and is a form of communication, a basis for publicity and advertising
Included in EIS	Yes
Data source	Numerator: European Union Intellectual Property Office (EUIPO). Data provided by Science Metrix as part of a contract to DG Research and Innovation Denominator: Eurostat
Data availability	NUTS 2: two-year averages for 2015 – 2022

Design applications per billion regional GDP	
Numerator	Number of designs applied for at EUIPO
Denominator	Gross Domestic Product in Purchasing Power Standard
Rationale	A design is the outward appearance of a product or part of it resulting from the lines, contours, colours, shape, texture, materials and/or its ornamentation. A product can be any industrial or handicraft item including packaging, graphic symbols and typographic typefaces but excluding computer programs. It also includes products that are composed of multiple components, which may be disassembled and reassembled. Community design protection is directly enforceable in each Member State, and it provides both the option of an unregistered and a registered Community design right for one area encompassing all Member States
Included in EIS	No, proxy for EIS indicator covering individual design applications
Data source	Numerator: European Union Intellectual Property Office (EUIPO). Data provided by Science Metrix as part of a contract to DG Research and Innovation Denominator: Eurostat
Data availability	NUTS 2: two-year averages for 2015 - 2022

Employment in knowledge-intensive activities (percentage of total employment)	
Numerator	Number of employed persons in knowledge-intensive activities in business industries. Knowledge-intensive activities are defined, based on EU Labour Force Survey data, as all NACE Rev.2 industries at 2-digit level where at least 33% of employment has a higher education degree (ISCED 5-8)
Denominator	Total employment
Rationale	Knowledge-intensive activities provide services directly to consumers, such as telecommunications, and provide inputs to the innovative activities of other firms in all sectors of the economy
Included in EIS	Yes, but for RIS alternative data used for Employment in Medium-high and high-tech manufacturing and Employment in Knowledge-intensive services
Data source	Eurostat
Data availability	NUTS 2: 2014 – 2021

Employment in innovative SMEs	
Numerator	Number of employed persons in innovative SMEs ('SMEs that have either introduced an innovation or have any kind of innovation activity including SMEs with abandoned/suspended or on-going innovation activities)
Denominator	Total employment
Rationale	Innovation in enterprises has a profound impact on the employability of workers, but its effect in product- and process-innovation oriented firms varies across countries. Firm innovation proves to be specifically important during a time of economic recession. Although high-skilled employees are less affected by a recession than low-skilled employees, a notable positive effect is observed for low-skilled employees in innovative firms as well.
Included in EIS	Yes
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2018 and CIS 2020 Own estimates for 2014 and 2016 combining country-level data and region to country scores for 2018

Sales of new-to-market and new-to-firm innovations in SMEs as percentage of turnover	
Numerator	Sum of total turnover of new or significantly improved products for SMEs
Denominator	Total turnover for SMEs
Rationale	This indicator measures the turnover of new or significantly improved products and includes both products which are only new to the firm and products which are also new to the market. The indicator thus captures both the creation of state-of-the-art technologies (new to market products) and the diffusion of these technologies (new to firm products)
Included in EIS	No, proxy for EIS indicator including all enterprises
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2014, CIS 2016, CIS 2018, CIS 2020

Air emissions by fine particulate matter (PM2.5) in the manufacturing sector	
Numerator	Air emissions by fine particulate matter (PM2.5) in the Manufacturing sector in Tonnes
Denominator	Value added in the Manufacturing sector - Chain linked volumes (2010), million euro
Rationale	Air pollution may be anthropogenic (human-induced) or of natural origin. Air pollution has the potential to harm both human health and the environment: particulate matter (PM), nitrogen dioxide and ground-level ozone are known to pose particular health risks. Long-term and peak exposures to these pollutants may be associated, among other impacts, with cardiovascular and respiratory diseases or an increased incidence of cancer. This indicator captures average concentration levels of fine particulate matter (PM2.5 — particles with a diameter of 2.5 micrometres or less) to which the population is exposed. The EU set an annual limit of 25 µg/m³ for fine particulate matter in Directive 2008/50/EC[7] on ambient air quality and cleaner air, while the World Health Organisation (WHO) set a more stringent, but non-binding guideline value, whereby annual mean concentrations should not exceed 10 µg/m³ in order to protect human health. PM2.5 is considered by the WHO as the pollutant with the highest impact on human health.
Included in EIS	Yes, but for RIS alternative data used for Exposure to fine particulates (PM 2.5)
Data source	European Environmental Agency
Data availability	NUTS 2: 2013 - 2020

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0050

Annex 3: Regional innovation performance groups

		"2023" performance score relative to EU 2016	"2023" performance score relative to EU 2023	Performance change over time compared to EU in 2016	Performance subgroup
EU27	European Union	108.5	100.0	8.5	
BE	Belgium				
BE1	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest	140.2	129.3	14.2	Innovation leader -
BE2	Vlaams Gewest	141.3	130.3	13.3	Innovation leader -
BE3	Région Wallonne	123.1	113.5	13.9	Strong innovator
BG	Bulgaria				
BG31	Severozapaden	29.5	27.2	-3.7	Emerging innovator -
BG32	Severen tsentralen	42.1	38.8	4.9	Emerging innovator
BG33	Severoiztochen	39.3	36.2	0.9	Emerging innovator
BG34	Yugoiztochen	36.4	33.6	6.9	Emerging innovator -
BG41	Yugozapaden	66.8	61.6	8.3	Emerging innovator +
BG42	Yuzhen tsentralen	43.5	40.1	4.8	Emerging innovator
CZ	Czech Republic				
CZ01	Praha	138.4	127.6	24.0	Innovation leader -
CZ02	Střední Čechy	96.1	88.6	19.7	Moderate innovator
CZ03	Jihozápad	87.8	81.0	15.6	Moderate innovator
CZ04	Severozápad	71.6	66.0	19.0	Emerging innovator +
CZ05	Severovýchod	95.9	88.4	12.2	Moderate innovator
CZ06	Jihovýchod	109.6	101.0	22.3	Strong innovator -
CZ07	Střední Morava	95.6	88.2	18.8	Moderate innovator
CZ08	Moravskoslezsko	94.2	86.9	25.7	Moderate innovator
DK	Denmark				
DK01	Hovedstaden	169.5	156.3	10.7	Innovation leader +
DK02	Sjælland	114.1	105.2	7.3	Strong innovator -
DK03	Syddanmark	122.5	112.9	10.4	Strong innovator
DK04	Midtjylland	152.7	140.7	17.3	Innovation leader
DK05	Nordjylland	140.5	129.6	29.2	Innovation leader -
DE	Germany				
DE11	Stuttgart	137.1	126.4	2.8	Innovation leader -
DE12	Karlsruhe	154.5	142.4	8.0	Innovation leader
DE13	Freiburg	135.5	124.9	4.2	Strong innovator +
DE14	Tübingen	141.6	130.6	3.5	Innovation leader -
DE21	Oberbayern	164.3	151.5	15.5	Innovation leader +
DE22	Niederbayern	105.3	97.0	9.1	Moderate innovator +
DE23	Oberpfalz	122.0	112.5	9.9	Strong innovator
DE24	Oberfranken	121.0	111.6	8.3	Strong innovator
DE25	Mittelfranken	141.2	130.2	6.6	Innovation leader -
DE26	Unterfranken	123.8	114.1	1.3	Strong innovator
DE27	Schwaben	116.2	107.2	1.5	Strong innovator -
DE3	Berlin	160.0	147.5	8.6	Innovation leader +
DE4	Brandenburg	111.6	102.9	10.6	Strong innovator -
DE5	Bremen	124.1	114.4	3.5	Strong innovator
DE6	Hamburg	148.1	136.5	19.4	Innovation leader
DE71	Darmstadt	132.3	122.0	8.9	Strong innovator +
DE72	Gießen	135.0	124.5	16.8	Strong innovator +
DE73	Kassel	99.8	92.0	1.9	Moderate innovator +
DE8	Mecklenburg-Vorpommern	91.6	84.5	-2.3	Moderate innovator
DE91	Braunschweig	135.1	124.5	6.7	Strong innovator +
DE92	Hannover	115.7	106.6	0.8	Strong innovator -
DE93	Lüneburg	105.3	97.1	12.8	Moderate innovator +
DE94	Weser-Ems	100.1	92.3	7.9	Moderate innovator +

		"2023" performance score relative to EU 2016	"2023" performance score relative to EU 2023	Performance change over time compared to EU in 2016	Performance subgroup
DEA1	Düsseldorf	119.6	110.3	10.2	Strong innovator
DEA2	Köln	141.9	130.8	11.5	Innovation leader -
DEA3	Münster	105.5	97.3	-2.3	Moderate innovator +
DEA4	Detmold	120.7	111.3	9.4	Strong innovator
DEA5	Arnsberg	118.9	109.7	7.5	Strong innovator
DEB1	Koblenz	116.1	107.1	13.3	Strong innovator -
DEB2	Trier	98.1	90.4	-1.5	Moderate innovator +
DEB3	Chemnitz ;en-Pfalz	131.8	121.5	8.6	Strong innovator +
DEC	Leipzig	108.7	100.2	-0.4	Strong innovator -
DED2	Dresden	134.5	124.0	14.0	Strong innovator +
DED4	Chemnitz	106.9	98.5	11.1	Moderate innovator +
DED5	Leipzig	130.1	119.9	9.5	Strong innovator +
DEE	Sachsen-Anhalt	96.8	89.3	10.4	Moderate innovator
DEF	Schleswig-Holstein	113.8	104.9	5.7	Strong innovator -
DEG	Thüringen	114.7	105.7	7.1	Strong innovator -
IE	Ireland				
IE04	Northern and Western	113.4	104.5	5.2	Strong innovator -
IE05	Southern	114.3	105.4	-6.7	Strong innovator -
IE06	Eastern and Midland	134.5	124.0	4.3	Strong innovator +
EL	Greece				
EL3	Attiki	97.6	90.0	21.9	Moderate innovator
EL41	Voreio Aigaio	62.4	57.5	10.6	Emerging innovator +
EL42	Notio Aigaio	60.1	55.4	14.5	Emerging innovator +
EL43	Kriti	89.4	82.4	13.7	Moderate innovator
EL51	Anatoliki Makedonia, Thraki	74.5	68.7	24.6	Emerging innovator +
EL52	Kentriki Makedonia	86.5	79.8	24.8	Moderate innovator -
EL53	Dytiki Makedonia	75.2	69.3	25.2	Emerging innovator +
EL54	Ipeiros	85.1	78.4	33.1	Moderate innovator -
EL61	Thessalia	78.5	72.3	25.9	Moderate innovator -
EL62	Ionia Nisia	60.5	55.8	14.0	Emerging innovator +
EL63	Dytiki Ellada	83.0	76.5	20.9	Moderate innovator -
EL64	Sterea Ellada	75.1	69.3	22.7	Emerging innovator +
EL65	Peloponnisos	77.0	71.0	30.8	Moderate innovator -
ES	Spain				
ES11	Galicia	87.5	80.7	8.4	Moderate innovator
ES12	Principado de Asturias	83.4	76.9	8.7	Moderate innovator -
ES13	Cantabria	83.4	76.9	10.1	Moderate innovator -
ES21	País Vasco	119.1	109.8	11.5	Strong innovator
ES22	Comunidad Foral de Navarra	110.4	101.8	14.1	Strong innovator -
ES23	La Rioja	90.1	83.1	6.5	Moderate innovator
ES24	Aragón	90.7	83.6	7.4	Moderate innovator
ES3	Comunidad de Madrid	115.7	106.6	12.8	Strong innovator -
ES41	Castilla y León	85.6	78.9	10.9	Moderate innovator -
ES42	Castilla-la Mancha	72.7	67.0	3.6	Emerging innovator +
ES43	Extremadura	70.5	65.0	8.6	Emerging innovator +
ES51	Cataluña	114.9	105.9	11.5	Strong innovator -
ES52	Comunidad Valenciana	102.0	94.0	10.6	Moderate innovator +
ES53	Illes Balears	77.1	71.1	9.2	Moderate innovator -
ES61	Andalucía	77.1	71.1	4.5	Moderate innovator -
ES62	Región de Murcia	83.2	76.7	7.1	Moderate innovator -
ES63	Ciudad Autónoma de Ceuta	38.3	35.3	2.2	Emerging innovator -
ES64	Ciudad Autónoma de Melilla	50.2	46.3	2.8	Emerging innovator
ES7	Canarias	62.1	57.2	11.7	Emerging innovator +
FR	France				
FR1	Île de France	140.5	129.5	-0.7	Innovation leader -

		"2023" performance score relative to EU 2016	"2023" performance score relative to EU 2023	Performance change over time compared to EU in 2016	Performance subgroup
FRB	Centre - Val de Loire	96.0	88.5	-5.4	Moderate innovator
FRC	Bourgogne - Franche-Comté	97.0	89.4	-10.4	Moderate innovator
FRD	Normandie	82.6	76.1	-13.1	Moderate innovator -
FRE	Hauts-de-France	89.3	82.4	-0.9	Moderate innovator
FRF	Grand Est	101.1	93.2	-5.9	Moderate innovator +
FRG	Pays de la Loire	104.0	95.8	0.3	Moderate innovator +
FRH	Bretagne	112.1	103.3	-1.5	Strong innovator -
FRI	Nouvelle-Aquitaine	99.6	91.9	-6.5	Moderate innovator +
FRJ	Occitanie	119.2	109.9	-8.3	Strong innovator
FRK	Auvergne - Rhône-Alpes	120.8	111.4	-7.0	Strong innovator
FRL	Provence-Alpes-Côte d'Azur	112.0	103.3	-4.7	Strong innovator -
FRM	Corse	50.5	46.5	-3.6	Emerging innovator
FRY	Régions ultrapériphériques françaises	69.9	64.4	5.4	Emerging innovator +
HR	Croatia				
HR02	Panonska Hrvatska	65.7	60.6	5.5	Emerging innovator +
HR03	Jadranska Hrvatska	72.6	66.9	12.3	Emerging innovator +
HR05	Grad Zagreb	111.5	102.8	22.2	Strong innovator -
HR06	Sjeverna Hrvatska	73.9	68.1	8.9	Emerging innovator +
IT	Italy				
ITC1	Piemonte	103.4	95.4	17.6	Moderate innovator +
ITC2	Valle d'Aosta/Vallée d'Aoste	78.9	72.8	7.8	Moderate innovator -
ITC3	Liguria	96.7	89.1	17.4	Moderate innovator
ITC4	Lombardia	105.7	97.4	15.0	Moderate innovator +
ITH1	Provincia Autonoma Bolzano/Bozen	96.0	88.5	13.4	Moderate innovator
ITH2	Provincia Autonoma Trento	109.3	100.8	13.3	Strong innovator -
ITH3	Veneto	106.2	97.9	14.7	Moderate innovator +
ITH4	Friuli-Venezia Giulia	109.6	101.0	13.5	Strong innovator -
ITH5	Emilia-Romagna	109.8	101.2	15.8	Strong innovator -
ITI1	Toscana	100.9	93.1	12.3	Moderate innovator +
ITI2	Umbria	106.3	98.0	17.9	Moderate innovator +
ITI3	Marche	107.1	98.7	27.8	Moderate innovator +
ITI4	Lazio	105.9	97.6	17.9	Moderate innovator +
ITF1	Abruzzo	96.7	89.2	26.0	Moderate innovator
ITF2	Molise	83.4	76.9	16.8	Moderate innovator -
ITF3	Campania	87.9	81.0	23.3	Moderate innovator
ITF4	Puglia	83.0	76.5	19.2	Moderate innovator -
ITF5	Basilicata	80.7	74.4	19.8	Moderate innovator -
ITF6	Calabria	80.4	74.2	20.4	Moderate innovator -
ITG1	Sicilia	73.0	67.3	15.5	Emerging innovator +
ITG2	Sardegna	75.3	69.4	12.3	Emerging innovator +
LT	Lithuania				
LT01	Sostinės regionas	111.8	103.1	17.1	Strong innovator -
LT02	Vidurio ir vakarų Lietuvos regionas	76.6	70.6	14.4	Moderate innovator -
HU	Hungary				
HU11	Budapest	110.0	101.4	7.7	Strong innovator -
HU12	Pest	72.9	67.2	6.5	Emerging innovator +
HU21	Közép-Dunántúl	65.7	60.6	3.5	Emerging innovator +
HU22	Nyugat-Dunántúl	64.9	59.8	9.0	Emerging innovator +
HU23	Dél-Dunántúl	62.7	57.8	10.8	Emerging innovator +
HU31	Észak-Magyarország	63.3	58.4	15.2	Emerging innovator +
HU32	Észak-Alföld	60.0	55.3	6.5	Emerging innovator +
HU33	Dél-Alföld	64.4	59.4	4.9	Emerging innovator +
NL	Netherlands				
NL11	Groningen	135.5	124.9	8.6	Strong innovator +
NL12	Friesland	108.8	100.3	6.0	Strong innovator -

		"2023" performance score relative to EU 2016	"2023" performance score relative to EU 2023	Performance change over time compared to EU in 2016	Performance subgroup
NL13	Drenthe	110.2	101.6	0.0	Strong innovator -
NL21	Overijssel	127.7	117.8	6.1	Strong innovator +
NL22	Gelderland	138.2	127.4	7.8	Innovation leader -
NL23	Flevoland	128.9	118.8	10.3	Strong innovator +
NL31	Utrecht	145.4	134.0	4.5	Innovation leader -
NL32	Noord-Holland	148.7	137.1	7.9	Innovation leader
NL33	Zuid-Holland	142.2	131.1	7.5	Innovation leader -
NL34	Zeeland	114.6	105.6	14.1	Strong innovator -
NL41	Noord-Brabant	140.8	129.8	9.7	Innovation leader -
NL42	Limburg	136.4	125.7	10.6	Innovation leader -
AT	Austria				
AT1	Ostösterreich	136.3	125.7	10.4	Innovation leader -
AT2	Südösterreich	126.1	116.2	2.7	Strong innovator
AT3	Westösterreich	124.4	114.7	4.3	Strong innovator
PL	Poland				
PL21	Malopolskie	87.0	80.2	19.3	Moderate innovator
PL22	Slaskie	62.6	57.7	11.6	Emerging innovator +
PL41	Wielkopolskie	61.1	56.3	11.9	Emerging innovator +
PL42	Zachodniopomorskie	55.0	50.7	8.9	Emerging innovator
PL43	Lubuskie	50.0	46.1	6.5	Emerging innovator
PL51	Dolnoslaskie	75.2	69.4	16.6	Emerging innovator +
PL52	Opolskie	51.3	47.3	10.7	Emerging innovator
PL61	Kujawsko-Pomorskie	60.3	55.6	12.5	Emerging innovator +
PL62	Warminsko-Mazurskie	58.8	54.2	15.7	Emerging innovator +
PL63	Pomorskie	72.5	66.8	13.2	Emerging innovator +
PL71	Lódzkie	63.9	58.9	12.7	Emerging innovator +
PL72	Swietokrzyskie	49.0	45.2	10.2	Emerging innovator
PL81	Lubelskie	63.9	58.9	17.0	Emerging innovator +
PL82	Podkarpackie	61.5	56.7	4.3	Emerging innovator +
PL84	Podlaskie	63.2	58.3	19.0	Emerging innovator +
PL91	Warszawski stoleczny	103.2	95.1	19.9	Moderate innovator +
PL92	Mazowiecki regionalny	40.4	37.3	4.1	Emerging innovator
PT	Portugal				
PT11	Norte	93.1	85.9	6.2	Moderate innovator
PT15	Algarve	73.3	67.6	13.3	Emerging innovator +
PT16	Centro	91.7	84.6	4.2	Moderate innovator
PT17	Lisboa	108.2	99.8	14.4	Moderate innovator +
PT18	Alentejo	76.0	70.1	7.5	Moderate innovator -
PT2	Região Autónoma dos Açores	60.3	55.6	7.3	Emerging innovator +
PT3	Região Autónoma da Madeira	66.8	61.6	11.8	Emerging innovator +
RO	Romania				
RO11	Nord-Vest	37.4	34.5	4.0	Emerging innovator -
RO12	Centru	27.9	25.7	1.3	Emerging innovator -
RO21	Nord-Est	38.9	35.8	2.2	Emerging innovator -
RO22	Sud-Est	20.6	18.9	-7.2	Emerging innovator -
RO31	Sud - Muntenia	25.0	23.0	0.9	Emerging innovator -
RO32	Bucuresti - Ilfov	64.5	59.5	1.9	Emerging innovator +
RO41	Sud-Vest Oltenia	21.4	19.8	3.5	Emerging innovator -
RO42	Vest	35.4	32.6	-0.9	Emerging innovator -
SI	Slovenia				
SI03	Vzhodna Slovenija	92.1	84.9	1.0	Moderate innovator
SI04	Zahodna Slovenija	114.3	105.4	4.1	Strong innovator -
SK	Slovakia				
SK01	Bratislavský kraj	99.0	91.3	1.9	Moderate innovator +
SK02	Západné Slovensko	60.7	56.0	8.0	Emerging innovator +

		"2023" performance score relative to EU 2016	"2023" performance score relative to EU 2023	Performance change over time compared to EU in 2016	Performance subgroup
SK03	Stredné Slovensko	66.9	61.7	8.8	Emerging innovator +
SK04	Východné Slovensko	67.3	62.1	4.4	Emerging innovator +
FI	Finland				
FI1B	Helsinki-Uusimaa	165.0	152.1	18.0	Innovation leader +
FI1C	Etelä-Suomi	131.8	121.5	16.4	Strong innovator +
FI19	Länsi-Suomi	134.1	123.7	14.4	Strong innovator +
FI1D	Pohjois- ja Itä-Suomi	132.4	122.0	18.3	Strong innovator +
FI2	Åland	79.0	72.9	-0.5	Moderate innovator -
SE	Sweden				
SE11	Stockholm	162.4	149.8	8.1	Innovation leader +
SE12	Östra Mellansverige	137.7	127.0	7.9	Innovation leader -
SE21	Småland med öarna	112.2	103.5	2.9	Strong innovator -
SE22	Sydsverige	147.5	136.0	7.0	Innovation leader
SE23	Västsverige	150.2	138.5	14.9	Innovation leader
SE31	Norra Mellansverige	99.1	91.4	3.6	Moderate innovator +
SE32	Mellersta Norrland	101.7	93.7	-2.3	Moderate innovator +
SE33	Övre Norrland	124.8	115.1	-1.0	Strong innovator
NO	Norway				
NO02	Hedmark og Oppland	100.7	92.8	15.4	Moderate innovator +
NO06	Trøndelag	138.9	128.0	2.4	Innovation leader -
NO07	Nord-Norge	118.4	109.2	13.7	Strong innovator
NO08	Oslo og Viken	141.7	130.6	15.7	Innovation leader -
NO09	Agder og Sør-Østlandet	119.7	110.4	19.2	Strong innovator
NO0A	Vestlandet	123.0	113.4	15.4	Strong innovator
NO0B	Jan Mayen and Svalbard	n/a	n/a	n/a	n/a
CH	Switzerland				
CH01	Région lémanique	136.2	125.6	-1.3	Innovation leader -
CH02	Espace Mittelland	133.4	122.9	5.1	Strong innovator +
CH03	Nordwestschweiz	148.8	137.1	-3.8	Innovation leader
CH04	Zürich	155.6	143.4	-6.9	Innovation leader
CH05	Ostschweiz	141.9	130.9	6.5	Innovation leader -
CH06	Zentralschweiz	133.4	123.0	-2.3	Strong innovator +
CH07	Ticino	150.6	138.9	20.4	Innovation leader
RS	Serbia				
RS11	Belgrade	89.0	82.1	23.2	Moderate innovator
RS12	Vojvodina	69.3	63.8	16.5	Emerging innovator +
RS21	Šumadija and Western Serbia	52.9	48.7	6.6	Emerging innovator
S	Southern and Eastern Serbia	53.8	49.6	11.7	Emerging innovator
UK	United Kingdom				
UKC	North East	110.5	101.9	-0.6	Strong innovator -
UKD	North West	113.8	104.9	3.9	Strong innovator -
UKE	Yorkshire and The Humber	117.0	107.9	5.6	Strong innovator -
UKF	East Midlands	122.5	112.9	6.6	Strong innovator
UKG	West Midlands	122.1	112.5	6.8	Strong innovator
UKH	East of England	131.5	121.2	7.4	Strong innovator +
UKI	London	142.2	131.1	5.5	Innovation leader -
UKJ	South East	141.4	130.3	6.2	Innovation leader -
UKK	South West	127.6	117.7	9.3	Strong innovator +
UKL	Wales	114.7	105.8	10.9	Strong innovator -
UKM	Scotland	116.4	107.3	5.8	Strong innovator -
UKN	Northern Ireland	102.8	94.8	8.6	Moderate innovator +

Annex 4: Regional Innovation Scoreboard normalised indicator scores for 2023

This annex gives the normalised scores for all indicators for the most recent year. Scores relative to EU average are not shown as these would allow recalculating confidential regional CIS data.

		Population with tertiary education	Lifelong learning	International scientific co-publications	Most-cited publications	Digital skills	R&D expenditures public sector	R&D expenditures business sector	Non-R&D innovation expenditures	Innovation expenditures per person employed	IT specialists	Product innovators	Business process innovators	Innovative SMEs collaborating with others	Public-private co-publications	PCT patent applications	Trademark applications	Design applications	Employment knowledge-intensive activities	Employment in innovative SMEs	Sales new-to-market and new-to-firm innovations	Air emissions by fine particulates
BE	Belgium																					
BE1	Région de Bruxelles-Capitale	0.869	0.515	1.000	0.644	0.469	0.560	0.668	0.209	1.000	0.977	0.658	0.854	1.000	0.981	0.444	0.555	0.410	0.716	0.750	0.383	0.669
BE2	Vlaams Gewest	0.798	0.371	0.611	0.745	0.477	0.635	0.850	0.519	1.000	0.675	0.764	1.000	0.932	0.679	0.631	0.459	0.531	0.597	0.889	0.636	0.651
BE3	Région wallonne	0.574	0.246	0.311	0.558	0.451	0.444	0.922	0.478	1.000	0.562	0.675	0.839	0.960	0.490	0.564	0.405	0.360	0.526	0.732	0.726	0.768
BG	Bulgaria																					
BG31	Severozapaden	0.073	0.000	0.015	0.000	0.022	0.157	0.285	0.323	0.190	N/A	0.357	0.290	0.206	0.097	0.086	0.187	0.104	0.194	0.343	0.361	0.252
BG32	Severen tsentralen	0.366	0.064	0.029	0.099	0.042	0.024	0.315	0.315	0.187	0.145	0.394	0.282	0.242	0.143	0.202	0.403	0.673	0.384	0.379	0.249	0.379
BG33	Severoiztochen	0.233	0.000	0.054	0.017	0.047	0.208	0.233	0.447	0.236	0.144	0.385	0.247	0.232	0.174	0.181	0.476	0.307	0.341	0.261	0.319	0.417
BG34	Yugoiztochen	0.162	0.004	0.022	0.014	0.040	0.122	0.285	0.307	0.190	0.065	0.414	0.242	0.206	0.169	0.188	0.265	0.353	0.313	0.298	0.478	0.462
BG41	Yugozapaden	0.643	0.053	0.247	0.053	0.049	0.383	0.512	0.328	0.275	0.915	0.496	0.347	0.355	0.409	0.260	0.824	0.608	0.687	0.383	0.412	0.190
BG42	Yuzhen tsentralen	0.200	0.030	0.064	0.150	0.048	0.217	0.315	0.328	0.185	0.176	0.406	0.271	0.258	0.215	0.236	0.499	0.481	0.336	0.320	0.423	0.332
CZ	Czechia																					
CZ01	Praha	0.940	0.364	1.000	0.222	0.445	0.815	0.642	0.585	0.671	1.000	0.909	1.000	0.722	0.966	0.252	0.648	0.513	1.000	0.739	0.577	0.531
CZ02	Střední Čechy	0.259	0.114	0.139	0.253	0.415	0.450	0.713	0.633	0.499	0.554	0.758	0.795	0.494	0.369	0.327	0.257	0.445	0.825	0.586	0.633	0.590
CZ03	Jihozápad	0.251	0.121	0.272	0.287	0.433	0.417	0.554	0.583	0.456	0.201	0.732	0.770	0.471	0.492	0.257	0.188	0.341	0.763	0.566	0.418	0.660
CZ04	Severozápad	0.027	0.068	0.040	0.047	0.395	0.108	0.315	0.861	0.637	0.232	0.527	0.717	0.504	0.241	0.220	0.186	0.283	0.626	0.588	0.306	0.601
CZ05	Severovýchod	0.297	0.152	0.161	0.214	0.403	0.325	0.576	0.780	0.536	0.287	0.708	0.790	0.563	0.386	0.388	0.241	0.438	0.900	0.649	0.759	0.530
CZ06	Jihovýchod	0.483	0.216	0.450	0.255	0.408	0.681	0.679	0.783	0.644	0.522	0.761	0.831	0.662	0.613	0.326	0.350	0.518	0.716	0.624	0.451	0.551
CZ07	Střední Morava	0.368	0.136	0.286	0.336	0.407	0.383	0.573	0.773	0.579	0.197	0.703	0.812	0.540	0.461	0.331	0.264	0.645	0.654	0.631	0.508	0.467
CZ08	Moravskoslezsko	0.286	0.235	0.211	0.241	0.412	0.376	0.491	0.856	0.583	0.447	0.771	0.775	0.497	0.434	0.289	0.296	0.390	0.697	0.601	0.671	0.349
DK	Denmark																					
DK01	Hovedstaden	1.000	0.943	1.000	0.747	0.738	0.827	0.965	0.342	0.731	1.000	0.719	0.823	0.628	1.000	0.860	0.726	0.816	0.796	0.559	0.525	0.755
DK02	Sjælland	0.322	0.735	0.342	0.584	0.709	0.485	0.446	0.360	0.731	0.361	0.560	0.480	0.543	0.596	0.576	0.306	0.538	0.379	0.559	0.722	0.774
DK03	Syddanmark	0.503	0.693	0.602	0.637	0.701	0.434	0.541	0.307	0.731	0.308	0.545	0.558	0.563	0.689	0.784	0.596	0.718	0.379	0.559	0.313	0.757
DK04	Midtjylland	0.690	0.795	1.000	0.701	0.728	0.639	0.647	0.560	0.731	0.542	0.686	0.742	0.591	0.935	0.855	0.736	0.969	0.483	0.559	0.476	0.794
DK05	Nordjylland	0.545	0.716	1.000	0.873	0.691	0.843	0.356	0.273	0.731	0.317	0.715	0.685	0.515	0.986	0.966	0.486	0.746	0.327	0.559	0.511	0.837
DE	Germany																					
DE11	Stuttgart	0.545	0.280	0.181	0.480	0.291	0.434	1.000	0.429	0.587	0.625	0.792	0.950	0.469	0.640	1.000	0.513	0.929	1.000	0.834	0.388	0.710
DE12	Karlsruhe	0.486	0.280	0.830	0.684	0.291	0.897	1.000	0.367	0.611	0.903	0.795	0.979	0.473	0.967	0.968	0.592	0.567	1.000	0.933	0.384	0.722
DE13	Freiburg	0.514	0.280	0.457	0.637	0.291	0.699	0.740	0.412	0.606	0.337	0.691	0.882	0.509	0.824	0.979	0.534	0.754	0.773	0.854	0.368	0.776
DE14	Tübingen	0.368	0.261	0.650	0.579	0.291	0.703	1.000	0.464	0.605	0.394	0.705	0.966	0.466	0.927	1.000	0.527	0.672	0.943	0.879	0.366	0.742
DE21	Oberbayern	0.641	0.269	0.736	0.687	0.300	0.749	0.998	0.354	0.575	1.000	1.000	1.000	0.729	0.998	1.000	0.831	0.765	1.000	0.840	0.504	0.692
DE22	Niederbayern	0.353	0.159	0.077	0.437	0.300	0.217	0.654	0.582	0.515	0.332	0.705	0.639	0.221	0.323	0.731	0.478	0.693	0.844	0.804	0.295	0.680
DE23	Oberpfalz	0.457	0.212	0.257	0.547	0.300	0.505	0.810	0.433	0.505	0.417	0.704	0.715	0.621	0.587	0.999	0.375	0.527	0.905	0.619	0.463	0.682
DE24	Oberfranken	0.455	0.201	0.264	0.598	0.300	0.485	0.764	0.362	0.507	0.342	0.787	0.736	0.544	0.537	0.837	0.477	0.764	0.673	0.742	0.464	0.700
DE25	Mittelfranken	0.472	0.239	0.533	0.597	0.300	0.662	0.917	0.448	0.560	0.795	0.688	0.821	0.477	0.908	1.000	0.511	0.886	0.844	0.754	0.381	0.672
DE26	Unterfranken	0.443	0.216	0.442	0.644	0.300	0.556	0.812	0.351	0.523	0.365	0.594	0.734	0.404	0.695	0.860	0.442	0.740	0.763	0.898	0.314	0.706
DE27	Schwaben	0.406	0.205	0.229	0.512	0.300	0.283	0.652	0.446	0.527	0.372	0.713	0.890	0.442	0.589	0.813	0.574	0.698	0.773	0.711	0.231	0.723
DE3	Berlin	0.745	0.375	0.809	0.644	0.307	0.987	0.633	0.564	0.675	1.000	0.789	0.944	0.883	0.996	0.708	1.000	0.531	0.815	0.734	0.516	0.600
DE4	Brandenburg	0.237	0.178	0.419	0.850	0.278	0.742	0.439	0.578	0.628	0.369	0.601	0.774	0.727	0.583	0.533	0.312	0.356	0.370	0.683	0.325	0.660
DE5	Bremen	0.335	0.330	0.762	0.639	0.240	1.000	0.543	0.307	0.541	N/A	0.663	0.774	0.489	0.909	0.534	0.410	0.372	0.640	0.813	0.271	0.692
DE6	Hamburg	0.623	0.352	0.790	0.627	0.312	0.673	0.606	0.446	0.589	1.000	0.787	1.000	0.393	0.936	0.551	1.000	0.501	0.834	1.000	0.415	0.684
DE71	Darmstadt	0.479	0.284	0.352	0.507	0.309	0.598	0.897	0.399	0.631	0.726	0.795	0.892	0.461	0.750	0.789	0.614	0.588	0.773	0.730	0.355	0.691
DE72	Gießen	0.437	0.360	0.582	0.510	0.309	0.782	0.652	0.422	0.599	N/A	0.708	0.821	0.750	0.791	0.698	0.469	1.000	0.445	0.939	0.272	0.719
DE73	Kassel	0.233	0.227	0.111	0.373	0.309	0.417	0.596	0.329	0.551	0.363	0.702	0.818	0.542	0.377	0.578	0.258	0.430	0.645	0.660	0.265	0.730
DE8	Mecklenburg-Vorpommern	0.242	0.182	0.374	0.490	0.253	0.776	0.392	0.462	0.646	0.257	0.210	0.515	0.738	0.688	0.372	0.201	0.211	0.289	0.591	0.126	0.721
DE91	Braunschweig	0.408	0.261	0.696	0.607	0.286	0.973	1.000	0.377	0.565	0.391	0.844	0.936	0.481	0.896	0.815	0.253	0.303	1.000	0.750	0.298	0.739
DE92	Hannover	0.313	0.254	0.348	0.490	0.286	0.670	0.645	0.465	0.559	0.488	0.454	0.728	0.241	0.740	0.780	0.478	0.767	0.588	0.734	0.265	0.737
DE93	Lüneburg	0.166	0.174	0.049	1.000	0.286	0.198	0.459	0.504	0.517	0.278	0.767	1.000	0.433	0.266	0.559	0.441	0.433	0.483	0.970	0.328	0.732
DE94	Weser-Ems	0.195	0.201	0.131	0.469	0.286	0.364	0.439	0.522	0.516	0.301	0.727	0.826	0.485	0.426	0.532	0.381	0.557	0.460	0.661	0.353	0.720
DEA1	Düsseldorf	0.315	0.261	0.246	0.608	0.306	0.455	0.672	0.385	0.551	0.534	0.661	0.928	0.438	0.606	0.739	0.723	0.703	0.592	0.740	0.281	0.661
DEA2	Köln	0.410	0.284	0.604	0.578	0.306	0.920	0.611	0.405	0.588	0.802	0.905	0.962	0.477	0.818	0.805	0.702	0.611	0.649	0.935	0.418	0.737
DEA3	Münster	0.226	0.231	0.146	0.565	0.306	0.528	0.466	0.331	0.525	0.448	0.598	0.925	0.359	0.380	0.673	0.515	0.637	0.469	0.787	0.273	0.675
DEA4	Detmold	0.246	0.273	0.163	0.426	0.306	0.465	0.665	0.655	0.563	0.484	0.661	0.877	0.433	0.457	0.797	0.657	0.924	0.588	0.849	0.290	0.732
DEA5	Arnsberg	0.268	0.284	0.268	0.511	0.306	0.586	0.570	0.426	0.559	0.395	0.699	0.805	0.546	0.565	0.699	0.509	0.920	0.540	0.797	0.365	0.721
DEB1	Koblenz	0.273	0.258	0.054	0.630	0.307	0.226	0.449	0.498	0.553	0.442	0.684	1.000	0.733	0.316	0.616	0.544	0.782	0.540	1.000	0.417	0.752

		Population with tertiary education	Lifelong learning	International scientific co-publications	Most-cited publications	Digital skills	R&D expenditures public sector	R&D expenditures business sector	Non-R&D innovation expenditures	Innovation expenditures per person employed	IT specialists	Product innovators	Business process innovators	Innovative SMEs collaborating with others	Public-private co-publications	PCT patent applications	Trademark applications	Design applications	Employment knowledge-intensive activities	Employment in innovative SMEs	Sales new-to-market and new-to-firm innovations	Air emissions by fine particulates
DEB2	Trier	0.346	0.220	0.148	0.509	0.307	0.383	0.376	0.429	0.505	N/A	0.484	0.950	0.176	0.507	0.645	0.615	0.546	0.043	0.636	0.270	0.812
DEB3	Rheinhessen-Pfalz	0.390	0.254	0.465	0.623	0.307	0.677	0.966	0.372	0.583	0.600	0.467	0.773	0.526	0.813	0.977	0.535	0.655	0.796	0.863	0.203	0.721
DEC	Saarland	0.364	0.220	0.388	0.510	0.259	0.688	0.515	0.455	0.539	N/A	0.461	0.900	0.315	0.712	0.557	0.361	0.424	0.536	0.637	0.268	0.762
DED2	Dresden	0.182	0.159	0.150	0.416	0.297	0.631	0.552	0.571	0.640	0.290	0.609	0.760	0.960	0.501	0.513	0.187	0.272	0.645	0.696	0.432	0.725
DED4	Chemnitz	0.428	0.216	0.677	0.590	0.297	1.000	0.814	0.590	0.666	0.516	0.526	0.801	0.926	0.860	0.745	0.367	0.413	0.654	0.726	0.358	0.655
DED5	Leipzig	0.514	0.341	0.816	0.630	0.297	0.937	0.320	0.495	0.623	0.680	0.577	0.813	0.943	1.000	0.420	0.304	0.307	0.583	0.793	0.349	0.661
DEE	Sachsen-Anhalt	0.133	0.159	0.287	0.458	0.250	0.728	0.347	0.431	0.654	0.271	0.485	0.775	0.823	0.580	0.415	0.141	0.376	0.322	0.581	0.319	0.697
DEF	Schleswig-Holstein	0.237	0.231	0.334	0.534	0.304	0.611	0.488	0.398	0.575	0.420	0.719	0.893	0.359	0.623	0.611	0.544	0.571	0.483	0.835	0.353	0.730
DEG	Thüringen	0.268	0.201	0.346	0.533	0.284	0.779	0.589	0.617	0.685	0.329	0.494	0.719	0.910	0.634	0.690	0.238	0.320	0.545	0.667	0.365	0.721
IE	Ireland																					
IE04	Northern and Western	0.902	0.424	0.498	0.574	0.768	0.325	0.524	0.094	0.616	0.416	0.654	0.858	0.667	0.590	0.336	0.422	0.556	0.355	0.546	0.711	0.902
IE05	Southern	0.945	0.417	0.422	0.685	0.748	0.325	0.524	0.272	0.655	0.520	0.597	0.727	0.659	0.556	0.336	0.161	0.208	0.616	0.612	1.000	0.945
IE06	Eastern and Midland	1.000	0.530	0.733	0.664	0.791	0.325	0.524	0.300	1.000	1.000	0.591	0.741	0.521	0.690	0.336	0.405	0.466	0.834	0.590	1.000	1.000
EL	Greece																					
EL3	Attiki	0.778	0.136	0.410	0.496	0.395	0.577	0.568	0.497	0.576	0.560	1.000	1.000	0.828	0.628	0.331	0.507	0.274	0.739	0.831	0.886	0.369
EL41	Voreio Aigaio	0.410	0.121	0.305	0.611	0.347	0.582	0.145	0.606	0.404	N/A	0.802	0.688	0.279	0.365	0.156	0.154	0.000	0.128	0.520	0.354	0.526
EL42	Notio Aigaio	0.231	0.034	0.039	0.710	0.347	0.283	0.055	0.431	0.316	N/A	1.000	0.733	0.434	0.161	0.113	0.188	0.224	0.209	0.726	0.545	0.475
EL43	Kriti	0.388	0.064	0.606	0.590	0.347	0.876	0.252	0.582	0.438	N/A	1.000	1.000	0.652	0.679	0.282	0.580	0.258	0.085	0.823	0.747	0.546
EL51	Anatoliki Makedonia, Thraki	0.475	0.076	0.218	0.546	0.339	0.551	0.280	0.481	0.396	N/A	0.912	0.948	0.589	0.484	0.128	0.254	0.221	0.095	0.840	0.769	0.388
EL52	Kentriki Makedonia	0.641	0.080	0.373	0.521	0.339	0.611	0.380	0.508	0.449	0.151	1.000	1.000	0.770	0.569	0.246	0.553	0.432	0.265	0.918	0.827	0.336
EL53	Dytiki Makedonia	0.521	0.087	0.172	0.881	0.339	0.417	0.198	0.458	0.405	N/A	0.986	0.972	0.731	0.436	0.060	0.180	0.387	0.000	0.658	0.664	0.523
EL54	Ipeiros	0.432	0.121	0.604	0.411	0.344	0.831	0.245	0.622	0.529	N/A	1.000	1.000	0.563	0.608	0.219	0.256	0.093	0.000	0.818	1.000	0.573
EL61	Thessalia	0.450	0.106	0.313	0.601	0.339	0.582	0.338	0.649	0.465	0.040	1.000	1.000	0.716	0.438	0.169	0.428	0.126	0.100	0.824	0.783	0.479
EL62	Ionia Nisia	0.350	0.038	0.089	0.328	0.344	0.352	0.205	0.570	0.433	N/A	0.788	0.922	0.222	0.183	0.000	0.159	0.107	0.024	0.712	0.860	0.623
EL63	Dytiki Ellada	0.461	0.083	0.462	0.441	0.344	0.752	0.320	0.477	0.568	0.100	1.000	1.000	0.918	0.634	0.262	0.232	0.207	0.171	0.774	0.753	0.569
EL64	Sterea Ellada	0.424	0.023	0.067	0.792	0.344	0.178	0.459	0.617	0.545	0.034	1.000	1.000	0.569	0.260	0.160	0.174	0.435	0.033	0.821	1.000	0.583
EL65	Peloponnisos	0.483	0.011	0.061	0.505	0.344	0.370	0.347	0.748	0.494	N/A	1.000	1.000	0.918	0.214	0.173	0.288	0.445	0.123	0.674	0.478	0.615
ES	Spain																					
ES11	Galicia	0.716	0.538	0.317	0.458	0.711	0.450	0.407	0.318	0.393	0.346	0.256	0.298	0.352	0.449	0.304	0.405	0.302	0.398	0.282	0.540	0.744
ES12	Principado de Asturias	0.820	0.519	0.303	0.361	0.721	0.383	0.380	0.314	0.462	0.443	0.240	0.310	0.294	0.466	0.434	0.220	0.240	0.336	0.289	0.370	0.650
ES13	Cantabria	0.772	0.576	0.411	0.471	0.727	0.470	0.325	0.241	0.314	0.220	0.259	0.330	0.248	0.520	0.415	0.285	0.136	0.332	0.314	0.543	0.650
ES21	País Vasco	1.000	0.602	0.437	0.546	0.732	0.439	0.711	0.334	0.647	0.527	0.452	0.437	0.614	0.615	0.440	0.470	0.352	0.754	0.489	0.913	0.708
ES22	Comunidad Foral de Navarra	0.980	0.572	0.488	0.587	0.738	0.495	0.621	0.435	0.516	0.208	0.369	0.342	0.400	0.653	0.468	0.527	0.457	0.635	0.397	0.681	0.763
ES23	La Rioja	0.603	0.500	0.318	0.553	0.727	0.394	0.315	0.402	0.413	0.174	0.302	0.359	0.393	0.335	0.267	0.791	0.537	0.237	0.338	0.570	0.719
ES24	Aragón	0.767	0.542	0.333	0.368	0.739	0.394	0.403	0.326	0.425	0.219	0.343	0.330	0.274	0.474	0.422	0.385	0.292	0.483	0.319	0.721	0.741
ES3	Comunidad de Madrid	0.876	0.553	0.567	0.493	0.750	0.586	0.583	0.324	0.485	1.000	0.375	0.379	0.276	0.670	0.411	0.702	0.398	0.777	0.297	0.717	0.650
ES41	Castilla y León	0.639	0.523	0.272	0.434	0.733	0.434	0.512	0.351	0.433	0.239	0.321	0.322	0.262	0.418	0.308	0.300	0.180	0.313	0.308	0.659	0.820
ES42	Castilla-la Mancha	0.550	0.417	0.131	0.564	0.722	0.304	0.338	0.303	0.331	0.196	0.235	0.216	0.201	0.301	0.226	0.381	0.393	0.223	0.196	0.583	0.646
ES43	Extremadura	0.475	0.443	0.170	0.445	0.723	0.460	0.239	0.210	0.287	0.312	0.298	0.228	0.240	0.275	0.194	0.187	0.233	0.118	0.246	0.577	0.872
ES51	Cataluña	0.809	0.455	0.524	0.634	0.744	0.519	0.554	0.394	0.487	0.594	0.415	0.382	0.274	0.660	0.555	0.817	0.592	0.682	0.360	0.787	0.551
ES52	Comunitat Valenciana	0.630	0.617	0.317	0.491	0.744	0.500	0.407	0.375	0.434	0.269	0.331	0.317	0.254	0.465	0.442	0.923	0.846	0.360	0.307	0.767	0.670
ES53	Illes Balears	0.581	0.477	0.192	0.616	0.748	0.304	0.239	0.373	0.324	0.186	0.191	0.204	0.220	0.344	0.240	0.735	0.540	0.204	0.114	0.319	0.760
ES61	Andalucía	0.534	0.443	0.271	0.489	0.722	0.524	0.343	0.358	0.378	0.289	0.241	0.246	0.213	0.357	0.322	0.401	0.270	0.218	0.200	0.464	0.628
ES62	Región de Murcia	0.475	0.485	0.257	0.477	0.745	0.480	0.407	0.262	0.343	0.208	0.317	0.284	0.251	0.400	0.359	0.731	0.476	0.194	0.226	0.589	0.576
ES63	Ciudad de Ceuta	0.188	0.451	0.057	1.000	0.705	0.079	0.000	0.000	0.000	N/A	0.000	0.000	0.000	0.115	0.000	0.093	0.000	0.095	0.000	0.237	0.724
ES64	Ciudad de Melilla	0.608	0.458	0.138	0.766	0.760	0.094	0.000	0.252	0.000	N/A	0.063	0.078	0.083	0.163	0.000	0.160	0.000	0.213	0.000	0.450	0.620
ES7	Canarias	0.501	0.470	0.210	0.422	0.743	0.400	0.182	0.297	0.287	0.373	0.179	0.263	0.129	0.386	0.000	0.315	0.211	0.223	0.169	0.309	N/A
FR	France																					
FR1	Île de France	1.000	0.443	0.524	0.549	0.629	0.607	0.772	0.233	1.000	1.000	0.637	0.724	0.717	0.679	0.752	0.419	0.614	0.829	0.633	0.342	0.665
FRB	Centre - Val de Loire	0.441	0.330	0.157	0.508	0.574	0.417	0.594	0.206	0.656	0.271	0.512	0.558	0.592	0.342	0.550	0.083	0.411	0.389	0.672	0.362	0.781
FRC	Bourgogne - Franche-Comté	0.561	0.348	0.188	0.532	0.545	0.334	0.627	0.219	0.779	0.156	0.464	0.643	0.515	0.370	0.517	0.168	0.550	0.322	0.615	0.250	0.797
FRD	Normandie	0.525	0.348	0.140	0.357	0.553	0.302	0.559	0.146	0.567	0.184	0.421	0.507	0.428	0.319	0.512	0.113	0.321	0.341	0.510	0.194	0.746
FRE	Hauts-de-France	0.528	0.318	0.183	0.391	0.571	0.354	0.447	0.155	0.748	0.361	0.508	0.579	0.480	0.364	0.467	0.169	0.496	0.332	0.483	0.147	0.673
FRF	Grand Est	0.623	0.364	0.258	0.434	0.579	0.475	0.454	0.350	0.921	0.232	0.486	0.707	0.473	0.407	0.541	0.228	0.303	0.412	0.642	0.275	0.739
FRG	Pays de la Loire	0.692	0.371	0.190	0.415	0.577	0.394	0.488	0.191	0.716	0.454	0.622	0.754	0.715	0.419	0.474	0.191	0.332	0.460	0.657	0.327	0.750
FRH	Bretagne	0.681	0.383	0.264	0.460	0.565	0.564	0.611	0.391	1.000	0.417	0.537	0.689	0.622	0.459	0.678	0.182	0.244	0.318	0.625	0.521	0.777
FRI	Nouvelle-Aquitaine	0.616	0.417	0.204	0.489	0.567	0.421	0.496	0.325	0.868	0.272	0.492	0.621	0.607	0.406	0.478	0.242	0.343	0.280	0.545	0.301	0.776
FRJ	Occitanie	0.712	0.367	0.395	0.536	0.557	0.817	0.821	0.296	0.967	0.595	0.514	0.715	0.584	0.535	0.616	0.215	0.334	0.474	0.593	0.276	0.766

		Population with tertiary education	Lifelong learning	International scientific co-publications	Most-cited publications	Digital skills	R&D expenditures public sector	R&D expenditures business sector	Non-R&D innovation expenditures	Innovation expenditures per person employed	IT specialists	Product innovators	Business process innovators	Innovative SMEs collaborating with others	Public-private co-publications	PCT patent applications	Trademark applications	Design applications	Employment knowledge-intensive activities	Employment in innovative SMEs	Sales new-to-market and new-to-firm innovations	Air emissions by fine particulates
FRK	Auvergne - Rhône-Alpes	0.785	0.417	0.355	0.460	0.580	0.615	0.738	0.231	0.914	0.445	0.605	0.722	0.761	0.568	0.790	0.248	0.420	0.479	0.650	0.332	0.731
FRL	Provence-Alpes-Côte d'Azur	0.670	0.360	0.318	0.505	0.582	0.631	0.677	0.296	1.000	0.440	0.494	0.746	0.564	0.503	0.521	0.292	0.369	0.365	0.481	0.474	0.696
FRM	Corse	0.253	0.121	0.087	0.153	0.474	0.243	0.110	0.193	0.456	N/A	0.084	0.364	0.177	0.259	0.238	0.126	0.432	0.090	0.017	0.041	0.795
FRY	Régions ultrapériphériques françaises	0.282	0.227	0.050	0.276	0.543	0.495	0.134	1.000	1.000	0.172	0.395	0.535	0.347	0.178	0.156	0.007	0.063	0.095	0.356	0.214	N/A
HR	Croatia																					
HR02	Panonska Hrvatska	0.264	0.102	0.118	0.202	0.556	0.932	0.411	0.302	0.215	0.442	0.612	0.628	0.328	0.346	0.239	0.119	0.290	0.227	0.535	0.692	0.277
HR03	Jadranska Hrvatska	0.386	0.121	0.233	0.258	0.589	1.000	0.591	0.481	0.269	0.085	0.565	0.666	0.438	0.420	0.264	0.192	0.218	0.280	0.483	0.583	0.528
HR05	Grad Zagreb	0.734	0.375	0.916	0.221	0.556	1.000	1.000	0.346	0.407	0.561	0.993	0.883	0.751	0.927	0.239	0.386	0.338	0.754	0.714	0.898	0.285
HR06	Sjeverna Hrvatska	0.304	0.068	0.055	0.188	0.556	0.582	1.000	0.369	0.252	0.449	0.706	0.733	0.393	0.323	0.239	0.155	0.267	0.280	0.589	0.839	0.460
IT	Italy																					
ITC1	Piemonte	0.251	0.356	0.353	0.673	0.377	0.400	0.748	0.439	0.565	0.441	0.691	0.923	0.502	0.625	0.527	0.459	0.557	0.796	0.703	0.641	0.248
ITC2	Valle d'Aosta/Vallée d'Aoste	0.253	0.364	0.110	0.590	0.392	0.208	0.320	0.281	0.631	N/A	0.554	0.537	0.217	0.519	0.422	0.347	0.603	0.076	0.412	0.641	0.719
ITC3	Liguria	0.257	0.409	0.505	0.610	0.382	0.510	0.509	0.341	0.754	0.309	0.599	0.699	0.540	0.711	0.451	0.330	0.308	0.521	0.513	0.641	0.642
ITC4	Lombardia	0.293	0.356	0.418	0.801	0.393	0.304	0.568	0.362	0.593	0.635	0.612	0.726	0.482	0.659	0.545	0.699	0.795	0.839	0.661	0.641	0.142
ITH1	Provincia Autonoma Bolzano/Bozen	0.144	0.269	0.426	0.635	0.382	0.259	0.403	0.424	0.565	0.154	0.560	0.723	0.591	0.929	0.433	0.747	0.601	0.289	0.667	0.641	0.620
ITH2	Provincia Autonoma Trento	0.299	0.523	0.941	0.735	0.399	0.643	0.432	0.450	0.718	0.425	0.599	0.718	0.530	0.831	0.465	0.546	0.408	0.441	0.642	0.641	0.536
ITH3	Veneto	0.359	0.364	0.383	0.742	0.387	0.383	0.538	0.428	0.574	0.277	0.649	0.764	0.683	0.581	0.586	0.783	0.999	0.654	0.671	0.641	0.131
ITH4	Friuli-Venezia Giulia	0.282	0.428	0.728	0.587	0.390	0.564	0.532	0.574	0.555	0.258	0.726	0.788	0.558	0.710	0.628	0.491	0.792	0.559	0.678	0.641	0.480
ITH5	Emilia-Romagna	0.368	0.428	0.498	0.668	0.403	0.439	0.699	0.381	0.631	0.371	0.665	0.731	0.470	0.713	0.679	0.643	0.835	0.744	0.623	0.641	0.342
ITI1	Toscana	0.259	0.379	0.555	0.704	0.386	0.524	0.524	0.372	0.548	0.277	0.521	0.562	0.520	0.736	0.517	0.678	0.698	0.469	0.578	0.641	0.556
ITI2	Umbria	0.359	0.402	0.474	0.648	0.373	0.470	0.376	0.466	0.629	0.353	0.765	0.813	0.624	0.643	0.445	0.409	1.000	0.493	0.654	0.641	0.549
ITI3	Marche	0.297	0.345	0.302	0.653	0.369	0.417	0.407	0.505	0.591	0.217	0.841	0.861	0.745	0.548	0.456	0.621	1.000	0.540	0.740	0.641	0.577
ITI4	Lazio	0.326	0.390	0.563	0.674	0.396	0.710	0.488	0.307	0.616	1.000	0.618	0.715	0.459	0.718	0.350	0.464	0.405	0.687	0.559	0.641	0.461
ITF1	Abruzzo	0.282	0.314	0.435	0.774	0.373	0.444	0.380	0.488	0.711	0.191	0.653	0.837	0.502	0.602	0.400	0.368	0.397	0.536	0.652	0.641	0.567
ITF2	Molise	0.299	0.337	0.347	0.621	0.355	0.383	0.432	0.475	0.626	N/A	0.346	0.436	0.575	0.710	0.322	0.270	0.202	0.412	0.268	0.641	0.605
ITF3	Campania	0.137	0.235	0.314	0.767	0.372	0.524	0.436	0.462	0.650	0.332	0.548	0.624	0.341	0.587	0.340	0.455	0.365	0.417	0.550	0.641	0.488
ITF4	Puglia	0.126	0.242	0.244	0.727	0.348	0.400	0.347	0.444	0.502	0.207	0.553	0.655	0.402	0.500	0.297	0.472	0.569	0.318	0.526	0.641	0.533
ITF5	Basilicata	0.220	0.322	0.195	0.617	0.359	0.439	0.220	0.577	0.395	0.244	0.291	0.570	0.629	0.474	0.226	0.287	0.626	0.469	0.343	0.641	0.654
ITF6	Calabria	0.120	0.258	0.211	0.868	0.352	0.406	0.226	0.399	0.899	0.145	0.498	0.760	0.527	0.423	0.271	0.216	0.205	0.180	0.502	0.641	0.664
ITG1	Sicilia	0.058	0.231	0.242	0.643	0.350	0.460	0.320	0.488	0.484	0.199	0.472	0.475	0.406	0.477	0.269	0.274	0.273	0.261	0.306	0.641	0.633
ITG2	Sardegna	0.106	0.383	0.315	0.604	0.380	0.560	0.205	0.261	0.523	0.227	0.384	0.630	0.354	0.521	0.237	0.342	0.231	0.204	0.377	0.641	0.729
LT	Lithuania																					
LT01	Sostinės regionas	0.251	0.356	0.353	0.673	0.377	0.400	0.748	0.439	0.565	0.441	0.691	0.923	0.502	0.625	0.527	0.459	0.557	0.796	0.703	0.641	0.248
LT02	Vidurio ir vakarų Lietuvos regionas	0.253	0.364	0.110	0.590	0.392	0.208	0.320	0.281	0.631	N/A	0.554	0.537	0.217	0.519	0.422	0.347	0.603	0.076	0.412	0.641	0.719
HU	Hungary																					
HU11	Budapest	0.967	0.235	0.661	0.310	0.384	0.455	0.776	0.355	0.542	1.000	0.489	0.364	0.624	0.827	0.436	0.356	0.271	1.000	0.358	0.239	0.354
HU12	Pest	0.417	0.121	0.062	0.300	0.373	0.217	0.446	0.398	0.366	0.609	0.339	0.277	0.316	0.318	0.436	0.362	0.308	0.754	0.239	0.205	0.433
HU21	Közép-Dunántúl	0.202	0.223	0.072	0.251	0.365	0.217	0.694	0.357	0.329	0.240	0.375	0.230	0.302	0.315	0.273	0.118	0.123	0.791	0.270	0.324	0.501
HU22	Nyugat-Dunántúl	0.251	0.098	0.090	0.480	0.364	0.178	0.436	0.375	0.290	0.090	0.341	0.263	0.371	0.316	0.234	0.111	0.255	0.730	0.231	0.445	0.545
HU23	Dél-Dunántúl	0.180	0.148	0.156	0.256	0.348	0.364	0.372	0.490	0.355	0.104	0.340	0.247	0.410	0.453	0.245	0.197	0.388	0.336	0.204	0.199	0.476
HU31	Észak-Magyarország	0.038	0.197	0.075	0.096	0.333	0.189	0.429	0.857	0.530	0.099	0.357	0.269	0.350	0.276	0.247	0.190	0.184	0.635	0.319	0.280	0.387
HU32	Észak-Alföld	0.135	0.216	0.170	0.289	0.343	0.370	0.407	0.491	0.410	0.104	0.277	0.193	0.268	0.382	0.218	0.174	0.255	0.336	0.163	0.366	0.433
HU33	Dél-Alföld	0.120	0.205	0.204	0.299	0.335	0.417	0.482	0.454	0.357	0.175	0.325	0.216	0.286	0.541	0.357	0.243	0.175	0.341	0.233	0.219	0.458
NL	Netherlands																					
NL11	Groningen	0.807	1.000	1.000	0.856	1.000	0.564	0.681	0.254	0.586	0.622	0.569	0.659	0.711	1.000	0.543	0.317	0.206	0.483	0.628	0.338	0.749
NL12	Friesland	0.543	0.841	0.061	0.620	1.000	0.564	0.681	0.254	0.586	0.387	0.569	0.659	0.711	0.302	0.426	0.270	0.297	0.393	0.628	0.338	0.768
NL13	Drenthe	0.521	0.890	0.171	0.523	1.000	0.564	0.681	0.254	0.586	0.492	0.569	0.659	0.711	0.369	0.380	0.283	0.250	0.436	0.628	0.338	0.733
NL21	Overijssel	0.767	0.973	0.443	0.724	1.000	0.564	0.681	0.254	0.586	0.469	0.569	0.659	0.711	0.651	0.541	0.473	0.583	0.479	0.628	0.338	0.705
NL22	Gelderland	0.794	0.951	0.869	0.870	1.000	0.564	0.681	0.254	0.586	0.613	0.569	0.659	0.711	0.832	0.594	0.501	0.583	0.564	0.628	0.338	0.682
NL23	Flevoland	0.503	0.955	0.083	1.000	1.000	0.564	0.681	0.254	0.586	1.000	0.569	0.659	0.711	0.373	0.293	0.652	0.616	0.725	0.628	0.338	0.724
NL31	Utrecht	1.000	1.000	1.000	0.868	1.000	0.564	0.681	0.254	0.586	1.000	0.569	0.659	0.711	1.000	0.514	0.432	0.322	0.744	0.628	0.338	0.694
NL32	Noord-Holland	0.967	1.000	0.911	0.869	1.000	0.564	0.681	0.254	0.586	1.000	0.569	0.659	0.711	0.876	0.469	0.821	0.455	0.825	0.628	0.338	0.714
NL33	Zuid-Holland	0.898	1.000	0.865	0.818	1.000	0.564	0.681	0.254	0.586	0.861	0.569	0.659	0.711	0.893	0.632	0.499	0.433	0.659	0.628	0.338	0.700
NL34	Zeeland	0.596	0.913	0.044	0.862	1.000	0.564	0.681	0.254	0.586	0.421	0.569	0.659	0.711	0.262	0.489	0.288	0.426	0.502	0.628	0.338	0.687
NL41	Noord-Brabant	0.809	0.905	0.340	0.754	1.000	0.564	0.681	0.254	0.586	0.661	0.569	0.659	0.711	0.676	1.000	0.595	1.000	0.711	0.628	0.338	0.669

		Population with tertiary education	Lifelong learning	International scientific co-publications	Most-cited publications	Digital skills	R&D expenditures public sector	R&D expenditures business sector	Non-R&D innovation expenditures	Innovation expenditures per person employed	IT specialists	Product innovators	Business process innovators	Innovative SMEs collaborating with others	Public-private co-publications	PCT patent applications	Trademark applications	Design applications	Employment knowledge-intensive activities	Employment in innovative SMEs	Sales new-to-market and new-to-firm innovations	Air emissions by fine particulates
NL42	Limburg	0.798	0.818	0.867	0.793	1.000	0.564	0.681	0.254	0.586	0.464	0.569	0.659	0.711	0.790	0.789	0.467	0.594	0.578	0.628	0.338	0.712
AT	Austria																					
AT1	Ostösterreich	0.656	0.576	0.744	0.634	0.631	0.742	0.688	0.295	0.829	0.792	0.634	0.809	0.723	0.830	0.620	0.876	0.585	0.607	0.702	0.689	0.637
AT2	Südösterreich	0.492	0.473	0.554	0.508	0.614	0.647	1.000	0.443	0.727	0.319	0.574	0.670	0.662	0.923	0.781	0.655	0.777	0.550	0.634	0.564	0.656
AT3	Westösterreich	0.455	0.462	0.388	0.528	0.626	0.455	0.823	0.408	0.659	0.333	0.658	0.837	0.552	0.717	0.808	0.875	0.992	0.555	0.753	0.464	0.706
PL	Poland																					
PL21	Malopolskie	0.687	0.261	0.294	0.265	0.338	0.603	0.681	0.378	0.368	0.687	0.287	0.381	0.288	0.473	0.358	0.504	0.971	0.512	0.371	0.288	0.193
PL22	Slaskie	0.510	0.125	0.127	0.223	0.338	0.339	0.403	0.327	0.282	0.448	0.256	0.274	0.287	0.313	0.193	0.279	0.632	0.588	0.319	0.223	0.129
PL41	Wielkopolskie	0.348	0.110	0.145	0.299	0.341	0.406	0.356	0.296	0.239	0.253	0.200	0.306	0.188	0.317	0.178	0.479	0.808	0.384	0.269	0.120	0.407
PL42	Zachodniopomorskie	0.397	0.110	0.093	0.309	0.341	0.345	0.233	0.257	0.198	0.229	0.231	0.301	0.265	0.269	0.135	0.256	0.498	0.313	0.270	0.144	0.611
PL43	Lubuskie	0.364	0.072	0.072	0.374	0.341	0.079	0.334	0.226	0.241	N/A	0.122	0.121	0.094	0.222	0.139	0.353	0.872	0.299	0.094	0.073	0.537
PL51	Dolnoslaskie	0.681	0.284	0.211	0.274	0.340	0.444	0.482	0.246	0.284	0.658	0.205	0.280	0.213	0.392	0.279	0.336	0.510	0.654	0.296	0.461	0.416
PL52	Opolskie	0.279	0.110	0.109	0.188	0.340	0.243	0.320	0.241	0.219	N/A	0.213	0.246	0.164	0.267	0.195	0.368	0.498	0.270	0.287	0.252	0.345
PL61	Kujawsko-Pomorskie	0.430	0.242	0.121	0.279	0.336	0.339	0.400	0.451	0.346	0.203	0.157	0.245	0.272	0.296	0.178	0.253	0.629	0.251	0.268	0.221	0.455
PL62	Warminsko-Mazurskie	0.242	0.087	0.079	0.277	0.336	0.275	0.269	0.428	0.297	N/A	0.265	0.302	0.295	0.275	0.142	0.254	0.818	0.066	0.394	0.299	0.509
PL63	Pomorskie	0.494	0.220	0.196	0.304	0.336	0.439	0.596	0.269	0.295	0.410	0.277	0.319	0.325	0.396	0.242	0.429	0.546	0.517	0.313	0.158	0.573
PL71	Lódzkie	0.404	0.080	0.175	0.239	0.318	0.475	0.407	0.371	0.301	0.328	0.307	0.224	0.221	0.358	0.213	0.438	0.694	0.384	0.305	0.225	0.279
PL72	Swietokrzyskie	0.401	0.080	0.057	0.018	0.318	0.251	0.296	0.396	0.221	N/A	0.149	0.201	0.148	0.227	0.202	0.248	0.906	0.156	0.207	0.117	0.332
PL81	Lubelskie	0.479	0.197	0.151	0.325	0.330	0.556	0.360	0.521	0.326	0.137	0.250	0.321	0.296	0.330	0.193	0.242	0.645	0.161	0.296	0.212	0.414
PL82	Podkarpackie	0.459	0.102	0.067	0.181	0.330	0.318	0.546	0.310	0.277	0.207	0.279	0.274	0.292	0.245	0.187	0.408	0.644	0.346	0.372	0.228	0.424
PL84	Podlaskie	0.421	0.102	0.128	0.316	0.330	0.450	0.296	0.433	0.349	N/A	0.260	0.302	0.269	0.290	0.179	0.367	0.866	0.081	0.305	0.134	0.475
PL91	Warszawski stoleczny	1.000	0.356	0.515	0.257	0.351	0.533	0.756	0.308	0.387	1.000	0.349	0.555	0.402	0.614	0.252	0.665	0.651	0.815	0.486	0.368	0.275
PL92	Mazowiecki regionalny	0.388	0.057	0.014	0.066	0.351	0.094	0.338	0.234	0.168	N/A	0.109	0.226	0.099	0.128	0.252	0.198	0.464	0.199	0.209	0.067	0.403
PT	Portugal																					
PT11	Norte	0.647	0.398	0.454	0.500	0.497	0.542	0.573	0.408	0.307	0.429	0.441	0.578	0.194	0.507	0.419	0.702	0.799	0.403	0.490	0.714	0.688
PT15	Algarve	0.410	0.485	0.329	0.520	0.521	0.332	0.220	0.307	0.287	N/A	0.474	0.622	0.283	0.471	0.287	0.349	0.266	0.043	0.415	0.542	0.867
PT16	Centro	0.692	0.462	0.489	0.476	0.493	0.490	0.494	0.356	0.338	0.382	0.523	0.751	0.327	0.511	0.398	0.537	0.386	0.313	0.642	0.647	0.821
PT17	Lisboa	0.805	0.545	0.637	0.487	0.565	0.582	0.573	0.293	0.486	1.000	0.625	0.800	0.338	0.625	0.283	0.522	0.292	0.744	0.677	0.807	0.738
PT18	Alentejo	0.590	0.409	0.247	0.288	0.478	0.304	0.418	0.391	0.465	0.199	0.482	0.595	0.346	0.349	0.244	0.527	0.075	0.256	0.578	0.620	0.867
PT2	Região Autónoma dos Açores	0.149	0.295	0.269	0.438	0.550	0.290	0.123	0.247	0.183	N/A	0.397	0.566	0.306	0.400	0.131	0.225	0.295	0.085	0.552	0.758	N/A
PT3	Região Autónoma da Madeira	0.452	0.303	0.266	0.526	0.541	0.297	0.263	0.363	0.327	N/A	0.382	0.488	0.221	0.288	0.127	0.610	0.536	0.000	0.453	0.495	N/A
RO	Romania																					
RO11	Nord-Vest	0.155	0.284	0.183	0.474	0.068	0.178	0.134	0.103	0.132	0.205	0.033	0.000	0.053	0.325	0.134	0.272	0.189	0.341	0.000	0.137	0.525
RO12	Centru	0.000	0.019	0.093	0.208	0.068	0.045	0.306	0.095	0.059	0.120	0.081	0.000	0.067	0.289	0.111	0.163	0.131	0.479	0.000	0.076	0.516
RO21	Nord-Est	0.341	0.398	0.070	0.361	0.061	0.439	0.596	0.063	0.049	0.183	0.052	0.000	0.033	0.217	0.092	0.150	0.344	0.085	0.000	0.075	0.469
RO22	Sud-Est	0.000	0.155	0.033	0.154	0.056	0.108	0.055	0.050	0.092	N/A	0.000	0.000	0.035	0.150	0.086	0.122	0.183	0.303	0.000	0.058	0.415
RO31	Sud - Muntenia	0.000	0.201	0.024	0.216	0.059	0.063	0.306	0.038	0.092	0.049	0.000	0.000	0.024	0.162	0.110	0.077	0.248	0.540	0.000	0.037	0.373
RO32	Bucuresti - Ilfov	0.732	0.136	0.336	0.289	0.077	0.406	0.380	0.102	0.234	1.000	0.248	0.011	0.141	0.545	0.160	0.337	0.328	0.853	0.000	0.273	0.175
RO41	Sud-Vest Oltenia	0.067	0.080	0.046	0.372	0.059	0.108	0.078	0.209	0.095	N/A	0.000	0.000	0.025	0.175	0.070	0.069	0.194	0.199	0.000	0.010	0.283
RO42	Vest	0.007	0.038	0.097	0.306	0.070	0.157	0.388	0.122	0.104	0.127	0.020	0.000	0.029	0.273	0.165	0.132	0.229	0.943	0.000	0.087	0.410
SI	Slovenia																					
SI03	Vzhodna Slovenija	0.594	0.621	0.161	0.541	0.306	0.168	0.665	0.163	0.384	0.378	0.680	0.569	0.499	0.400	0.634	0.469	0.383	0.706	0.623	0.538	0.565
SI04	Zahodna Slovenija	0.758	0.742	0.832	0.410	0.327	0.615	0.707	0.148	0.412	0.764	0.788	0.681	0.555	0.847	0.335	0.729	0.460	0.891	0.644	0.326	0.503
SK	Slovakia																					
SK01	Bratislavský kraj	0.825	0.292	0.720	0.144	0.374	0.594	0.446	0.292	0.380	1.000	0.329	0.445	0.360	0.794	0.262	0.487	0.313	0.915	0.376	0.556	0.511
SK02	Západné Slovensko	0.397	0.083	0.104	0.189	0.338	0.189	0.388	0.459	0.384	0.191	0.161	0.236	0.212	0.248	0.282	0.236	0.391	0.919	0.278	0.228	0.458
SK03	Stredné Slovensko	0.388	0.125	0.152	0.304	0.344	0.370	0.325	0.390	0.309	0.278	0.298	0.418	0.413	0.303	0.199	0.282	0.452	0.645	0.362	0.246	0.419
SK04	Vachon Slovensko	0.530	0.163	0.173	0.217	0.326	0.290	0.338	0.467	0.317	0.473	0.240	0.266	0.229	0.335	0.214	0.288	0.399	0.540	0.309	0.542	0.403
FI	Finland																					
FI1B	Helsinki-Uusimaa	0.627	1.000	1.000	0.690	0.993	0.696	0.876	0.346	0.964	1.000	0.954	0.909	1.000	1.000	1.000	0.921	0.705	0.910	0.804	0.837	0.627
FI1C	Etelä-Suomi	0.417	1.000	0.685	0.696	0.955	0.564	0.576	0.354	0.723	0.542	0.711	0.794	1.000	0.705	0.692	0.422	0.704	0.555	0.785	0.683	0.417
FI19	Länsi-Suomi	0.455	1.000	0.548	0.655	0.968	0.564	0.764	0.364	0.679	0.652	0.750	0.876	1.000	0.728	0.813	0.495	0.694	0.540	0.757	0.473	0.455
FI1D	Pohjois- ja Itä-Suomi	0.410	1.000	0.676	0.671	0.940	0.666	0.716	0.398	0.891	0.416	0.711	0.865	1.000	0.749	0.837	0.379	0.412	0.398	0.742	0.682	0.410
FI2	Åland	N/A	0.890	0.030	N/A	N/A	0.045	0.334	0.734	0.743	N/A	0.235	0.583	0.488	0.000	0.331	0.449	0.000	N/A	0.733	0.047	N/A
SE	Sweden																					
SE11	Stockholm	0.945	1.000	1.000	0.742	0.704	0.615	0.859	0.323	0.873	1.000	0.948	0.893	0.601	1.000	1.000	1.000	0.585	1.000	0.751	0.679	0.936
SE12	Östra Mellansverige	0.656	1.000	1.000	0.618	0.703	0.837	0.847	0.305	0.655	0.632	0.725	0.753	0.601	0.956	0.995	0.419	0.330	0.687	0.714	0.409	0.954
SE21	Småland med öarna	0.503	1.000	0.243	0.489	0.675	0.275	0.616	0.357	0.484	0.531	0.678	0.771	0.595	0.376	0.721	0.480	0.891	0.469	0.719	0.303	0.882

		Population with tertiary education	Lifelong learning	International scientific co-publications	Most-cited publications	Digital skills	R&D expenditures public sector	R&D expenditures business sector	Non-R&D innovation expenditures	Innovation expenditures per person employed	IT specialists	Product innovators	Business process innovators	Innovative SMEs collaborating with others	Public-private co-publications	PCT patent applications	Trademark applications	Design applications	Employment knowledge-intensive activities	Employment in innovative SMEs	Sales new-to-market and new-to-firm innovations	Air emissions by fine particulates
SE22	Sydsverige	0.723	1.000	0.841	0.636	0.684	0.724	0.861	0.401	0.734	0.957	0.894	0.732	0.612	0.816	1.000	0.815	0.596	0.730	0.746	0.559	0.785
SE23	Västsverige	0.676	1.000	0.684	0.728	0.663	0.603	1.000	0.592	0.960	0.647	0.852	0.873	0.678	0.932	0.984	0.643	0.588	0.839	0.795	0.514	0.893
SE31	Norra Mellansverige	0.361	1.000	0.187	0.573	0.671	0.275	0.557	0.283	0.487	0.247	0.591	0.751	0.606	0.442	0.661	0.311	0.417	0.379	0.622	0.242	0.989
SE32	Mellersta Norrland	0.324	1.000	0.161	0.501	0.676	0.290	0.384	0.336	0.465	0.601	0.534	0.799	0.790	0.379	0.617	0.198	0.425	0.512	0.602	0.329	1.000
SE33	Övre Norrland	0.659	1.000	1.000	0.597	0.608	0.912	0.466	0.324	0.619	0.479	0.589	0.724	0.461	0.948	0.857	0.228	0.501	0.469	0.673	0.293	1.000
NO	Norway																					
NO02	Hedmark og Oppland	0.650	0.652	0.376	0.527	0.853	0.383	0.376	0.431	0.770	N/A	0.816	0.719	1.000	0.500	0.294	0.101	0.000	0.014	0.716	0.304	1.000
NO06	Trøndelag	0.814	0.754	1.000	0.666	0.852	1.000	0.908	0.586	0.859	0.568	0.821	0.731	1.000	1.000	0.838	0.163	0.159	0.322	0.796	0.356	0.990
NO07	Nord-Norge	0.574	0.708	1.000	0.660	0.848	0.779	0.414	0.528	0.648	N/A	0.687	0.763	1.000	0.783	0.395	0.079	0.161	0.076	0.652	0.574	1.000
NO08	Oslo og Viken	0.971	0.720	1.000	0.648	0.822	0.668	0.654	0.394	0.982	1.000	1.000	0.892	1.000	0.958	0.561	0.344	0.331	0.668	0.789	0.224	0.865
NO09	Agder og Sør-Østlandet	0.701	0.693	0.399	0.668	0.802	0.370	0.597	0.605	0.816	0.412	0.897	0.804	1.000	0.588	0.847	0.220	0.117	0.450	0.789	0.410	0.902
NO0A	Vestlandet	0.723	0.674	0.775	0.608	0.810	0.623	0.561	0.519	0.780	0.369	0.920	0.771	1.000	0.805	0.659	0.174	0.217	0.445	0.747	0.312	0.952
NO0B	Jan Mayen and Svalbard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CH	Switzerland																					
CH01	Région lémanique	0.763	0.811	1.000	0.764	0.791	0.635	0.692	N/A	N/A	0.504	0.541	0.493	0.209	1.000	0.918	0.750	0.596	0.536	0.849	0.155	0.748
CH02	Espace Mittelland	0.692	0.795	0.808	0.697	0.777	0.635	0.645	N/A	N/A	0.549	0.638	0.905	0.321	0.834	0.780	0.398	0.464	0.550	0.849	0.373	0.775
CH03	Nordwestschweiz	0.678	0.833	1.000	0.743	0.773	0.635	1.000	N/A	N/A	0.605	0.560	0.671	0.175	1.000	1.000	0.877	0.547	0.739	0.849	0.505	0.735
CH04	Zürich	1.000	0.951	1.000	0.939	0.799	0.635	0.594	N/A	N/A	1.000	0.774	0.875	0.416	1.000	0.845	0.470	0.295	0.834	0.849	0.556	0.734
CH05	Ostschweiz	0.634	0.739	0.316	0.689	0.788	0.635	0.635	N/A	N/A	0.388	0.867	0.879	0.573	0.616	0.812	0.511	1.000	0.583	0.849	1.000	0.775
CH06	Zentralschweiz	0.670	0.799	0.271	0.323	0.784	0.635	0.869	N/A	N/A	0.511	0.661	0.739	0.444	0.649	0.809	1.000	0.771	0.583	0.849	0.346	0.778
CH07	Ticino	0.814	0.769	0.935	0.749	0.791	0.635	0.310	N/A	N/A	0.596	0.994	1.000	0.464	0.912	0.756	1.000	0.591	0.479	0.849	0.837	0.620
RS	Serbia																					
RS11	Belgrade	0.661	0.242	0.466	0.243	0.186	0.619	0.449	0.252	0.214	0.909	0.874	0.679	0.340	0.513	0.187	0.058	0.060	0.720	0.629	0.555	0.000
RS12	Vojvodina	0.282	0.140	0.164	0.248	0.134	0.406	0.263	0.273	0.234	0.263	0.915	0.767	0.288	0.337	0.187	0.098	0.000	0.422	0.594	0.673	0.200
RS21	Šumadija and Western Serbia	0.239	0.080	0.060	0.268	0.139	0.178	0.110	0.465	0.252	0.127	0.714	0.616	0.255	0.153	0.187	0.056	0.037	0.204	0.472	0.641	0.000
RS22	Southern and Eastern Serbia	0.242	0.114	0.118	0.283	0.127	0.267	0.123	0.307	0.242	0.080	0.911	0.604	0.155	0.228	0.187	0.070	0.059	0.327	0.608	0.295	0.004
UK	United Kingdom																					
UKC	North East	0.412	0.470	0.572	0.756	0.773	0.428	0.466	0.520	0.737	0.428	0.417	0.468	0.609	0.633	0.547	0.127	0.250	0.417	0.676	0.491	N/A
UKD	North Wes	0.616	0.492	0.483	0.744	0.805	0.406	0.546	0.504	0.737	0.497	0.500	0.400	0.724	0.614	0.481	0.173	0.275	0.502	0.676	0.322	N/A
UKE	Yorkshire and The Humber	0.461	0.515	0.484	0.733	0.806	0.444	0.446	0.520	0.737	0.451	0.596	0.539	1.000	0.629	0.479	0.217	0.417	0.422	0.676	0.228	N/A
UKF	East Midlands	0.499	0.523	0.463	0.739	0.788	0.345	0.661	0.479	0.737	0.395	0.632	0.457	1.000	0.597	0.423	0.230	0.451	0.479	0.676	0.729	N/A
UKG	West Midlands	0.565	0.470	0.416	0.740	0.837	0.339	0.722	0.512	0.737	0.422	0.555	0.513	1.000	0.525	0.462	0.224	0.454	0.555	0.676	0.543	N/A
UKH	East of England	0.583	0.473	0.617	0.947	0.830	0.510	0.915	0.211	0.737	0.728	0.670	0.445	0.939	0.794	0.745	0.265	0.385	0.611	0.676	0.052	N/A
UKI	London	1.000	0.568	1.000	0.887	0.837	0.444	0.414	0.332	0.737	1.000	0.555	0.408	0.769	0.900	0.498	0.550	0.480	0.872	0.676	0.195	N/A
UKJ	South East	0.714	0.561	0.680	0.840	0.844	0.495	0.699	0.429	0.737	1.000	0.603	0.423	0.863	0.734	0.695	0.301	0.436	0.763	0.676	0.551	N/A
UKK	South West	0.641	0.610	0.450	0.778	0.819	0.412	0.581	0.500	0.737	0.507	0.635	0.513	1.000	0.590	0.654	0.227	0.342	0.526	0.676	0.579	N/A
UKL	Wales	0.525	0.557	0.429	0.674	0.788	0.376	0.422	1.000	0.737	0.321	0.542	0.351	0.694	0.580	0.485	0.160	0.237	0.332	0.676	0.701	N/A
UKM	Scotland	0.882	0.519	0.744	0.745	0.803	0.586	0.506	0.479	0.737	0.385	0.446	0.325	0.546	0.725	0.508	0.160	0.268	0.360	0.676	0.344	N/A
UKN	Northern Ireland	0.678	0.375	0.392	0.749	0.799	0.370	0.578	0.488	0.737	0.385	0.398	0.344	0.553	0.510	0.422	0.146	0.271	0.460	0.676	0.156	N/A

Annex 5: Regional profiles

This annex includes an example of a regional profile. Profiles for all regions are available on the RIS website:
https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/regional-innovation-scoreboard_en

Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)

	Data	Normalised score	Relative to	
			BE	EU
Tertiary education	56.7	0.869	117	165
Lifelong learning	14.6	0.515	148	139
International scientific co-publications	5548	1.000	185	326
Most-cited scientific publications	1130.1	0.644	94	118
Above average digital skills	26.4	0.469	100	100
R&D expenditures public sector	0.76	0.560	94	98
R&D expenditures business sector	1.48	0.668	77	99
Non-R&D innovation expenditures	±	0.209	±	±
Innovation expenditures per person employed	±	1.000	±	±
Employed ICT specialists	7.9	0.977	145	185
Product innovators	±	0.658	±	±
Business process innovators	±	0.854	±	±
Innovative SMEs collaborating	±	1.000	±	±
Public-private co-publications	869.2	0.982	157	251
PCT patent applications	1.68	0.444	76	72
Trademark applications	8.19	0.555	120	111
Design applications	1.98	0.410	86	71
Employment knowledge-intensive activities	19.3	0.716	122	126
Employment innovative enterprises	±	0.750	±	±
Sales of innovative products	±	0.383	±	±
Air emissions by fine particulates	9.8	0.669	97	112
Average normalised score	--	0.683	--	--
Country EIS-RIS correction factor	--	1.037	--	--
Regional Innovation Index (RII) 2023	--	0.708	--	--
Performance 2023 relative to EU in 2023	--	--	102.8	129.3
Performance 2023 relative to EU in 2016	--	--	--	140.2
Regional Innovation Index (RII) 2016	--	0.636	--	--
Performance 2016 relative to EU in 2016	--	--	103.0	126.0
Performance change over time	--	--	-0.2	14.2

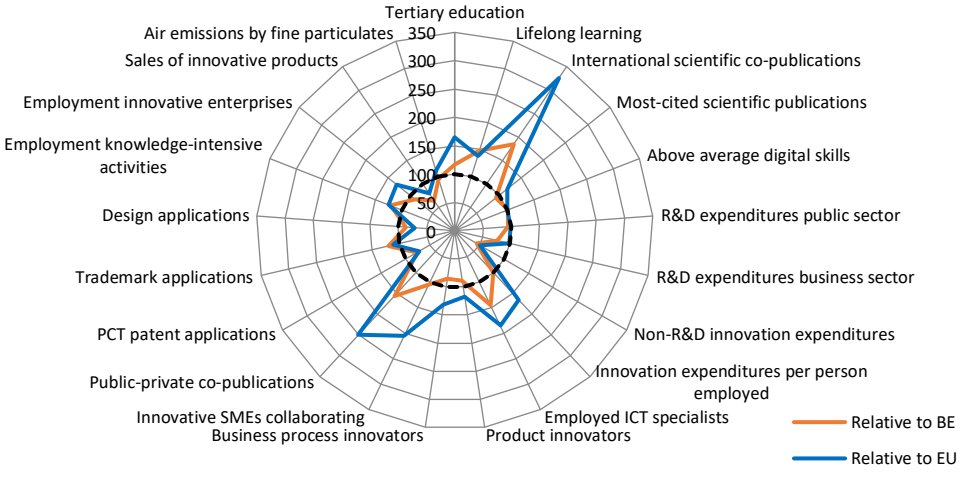
Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1) is an Innovation Leader -. Innovation performance has increased over time (14.2%).

The first 21 rows and two data columns in the table on the left show the values and the normalised scores per indicator. The last two data columns show relative performance of the normalised scores compared to Belgium and the EU. The next 7 rows show the calculation of the Regional Innovation Index (RII), the RII relative to both Belgium (102.8) and the EU (129.3) in 2023, the RII in 2023 relative to the EU in 2016 (140.2), and the RII in 2016 relative to both Belgium (103) and the EU in 2016 (126). The last row shows performance change between 2016 and 2023 compared to Belgium (-0.2%) and to the EU (14.2%).

The radar graph shows relative strengths compared to Belgium (orange line) and the EU (blue line), showing relative strengths (e.g. International scientific co-publications) and weaknesses (e.g. Non-R&D innovation expenditures).

The table below shows data highlighting possible structural differences, e.g. Population density (above EU average) and Employment in Manufacturing (below EU average).

	BE1	BE	EU
Share of employment in:			
Agriculture & Mining (A-B)	n/a	1.0	4.4
Manufacturing (C)	4.7	12.0	16.4
Utilities & Construction (D-F)	7.1	8.1	8.3
Services (G-N)	73.3	69.4	63.7
Public administration (O-U)	14.9	9.4	7.2
Average number of employed persons per enterprise	n/a	4.6	5.1
GDP per capita (PPS)	66,200	39,000	32,400
GDP per capita growth (PPS)	2.2	3.0	2.5
Population density	7,570	377	106
Urbanisation	100.0	86.9	75.8
Population size (000s)	1,230	11,550	447,210



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This study provides the results of the 2023 edition of the Regional Innovation Scoreboard.

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