European Commission

Regional Innovation Scoreboard 2021

Innovation

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Regional **Innovation** Scoreboard 2021

TABLE OF CONTENTS

Executive summary

This 10th edition of the Regional Innovation Scoreboard (RIS) provides a comparative assessment of performance of innovation systems across 240 regions of 22 EU Member States, Norway, Serbia, Switzerland, and the United Kingdom. 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.

The RIS accompanies the European Innovation Scoreboard (EIS), which assesses the performance of national innovation systems. The EIS provides an annual benchmark of the innovation performance of Member States, as well as other European countries and regional neighbours. Regional innovation benchmarks are less frequent and less detailed due to a general lack of innovation data at the regional level. The Regional Innovation Scoreboard addresses this gap by providing statistical facts on regions' innovation performance.

Regional performance groups

Following the EIS, where countries are classified into four innovation performance groups, Europe's regions have been classified into regional Innovation Leaders (38 regions), regional Strong Innovators (67 regions), regional Moderate Innovators (68 regions), and regional Emerging Innovators (67 regions). Ten countries have regions in more than two different performance groups.

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 '-' (shown on the map on the next page). The most innovative regions will be 'Innovation Leaders +', and the least innovative regions will be 'Emerging Innovators –'. At the level of the performance subgroups, there is more diversity in performance of regional innovation systems with 14 countries having regions in four or more different performance subgroups.

The most innovative regions are typically in the most innovative countries

The Innovation Leaders perform best on almost all indicators, in particular on those indicators measuring the performance of their research system and business innovation. They are outperformed by the Strong Innovators on three indicators, of which two measure innovation activities which are more closely linked to the adoption of existing technologies. All Regional Innovation Leaders belong to countries identified as Innovation Leaders or as Strong Innovators in the 2021 European Innovation Scoreboard, and most Regional Moderate and Emerging Innovators belong to countries identified as Moderate and Emerging Innovators in the 2021 European Innovation Scoreboard. Regional 'pockets of excellence' can be identified in several Moderate Innovator countries (*Praha* (CZ01) in Czechia, *Attiki* (EL3) and *Kriti* (EL43) in Greece, *País Vasco* (ES21) and *Comunidad de Madrid* (ES3) in Spain, and *Emilia-Romagna* (ITH5) in Italy) and Emerging Innovators (*Budapest* (HU11) in Hungary, *Warszawski stoleczny* (PL91) in Poland, *Bratislavský kraj* (SK01) in Slovakia, and *Belgrade* (RS11) in Serbia).

Rank results revealed: Stockholm most innovative region in the EU

The most innovative region in Europe is *Stockholm* (SE11) in Sweden, followed by *Helsinki-Uusimaa* (FI1B) in Finland, and *Oberbayern* (DE21) in Germany. *Hovedstaden* (DK01) in Denmark is in fourth place, and *Zürich* (CH04) in Switzerland is in fifth place.

For most regions, innovation performance has improved over time

For 225 regions out of 240, performance has increased over time. Performance has decreased for only 15 regions, including four regions in France, three each in Denmark and Germany, two in Romania, and one each in Czechia, Slovakia, and Switzerland.

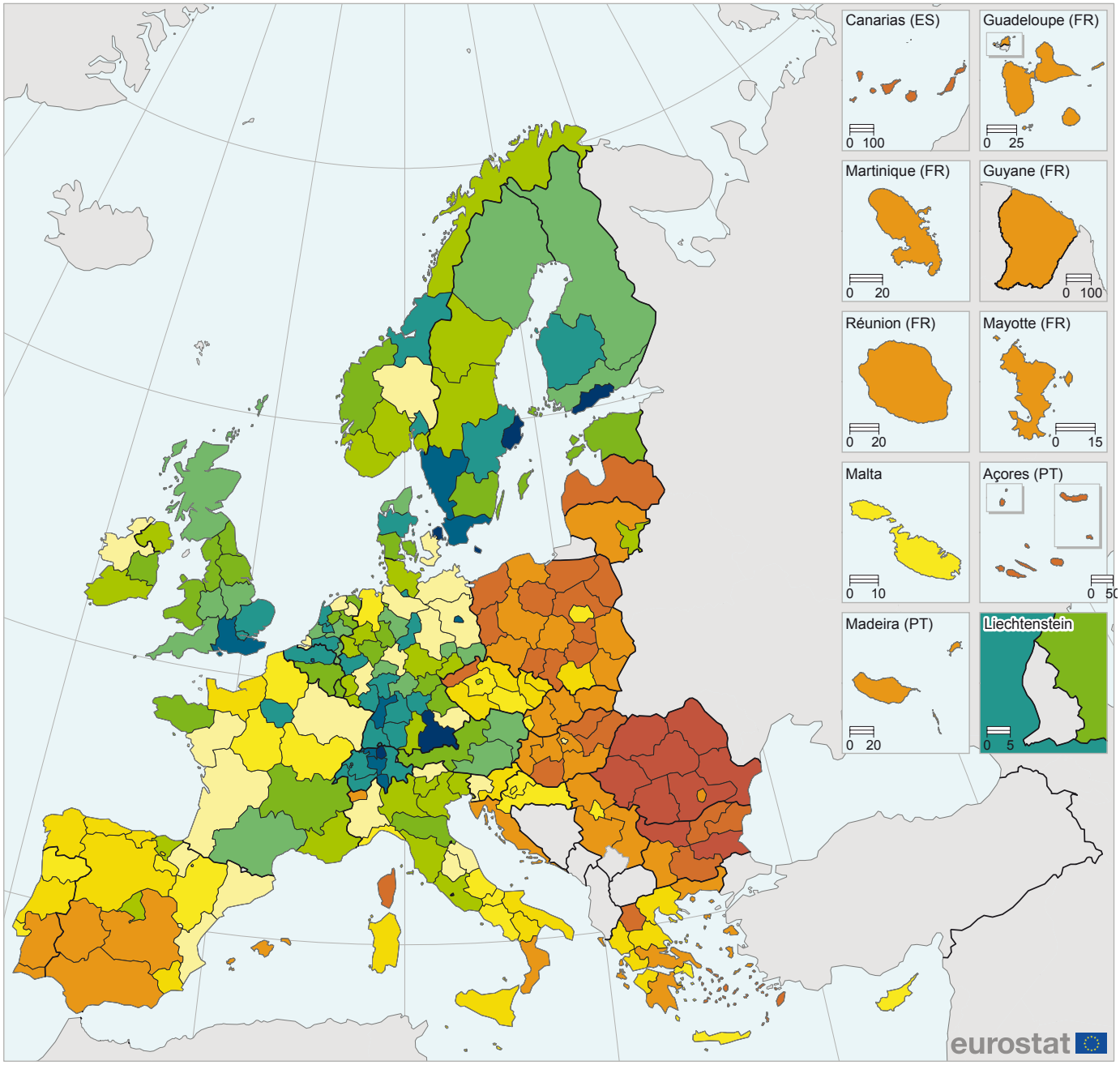
Performance relative to the EU has increased for all regions in Belgium, Croatia, Finland, Lithuania, and Norway, and all but one region in Greece and Italy. Performance relative to the EU has decreased for all regions in Austria, Bulgaria, Denmark, France, Ireland, Portugal, Romania, Slovakia, and Slovenia, and all but one region in Hungary and Switzerland.

When comparing to the growth performance of the EU, two out of five regions (40%) have improved their performance relative to the EU and three out of five regions (60%) have seen their performance worsen compared to the EU. The share of regions with positive performance change relative to the EU is highest for the Moderate Innovators (50%) and lowest for the Emerging Innovators (25%). Over time, there has been a process of convergence in regional performance with decreasing performance differences between regions.

Results suggest that innovation performance has increased most due to increasing performance in those indicators measuring innovation activities in the business sector, with results over time having been calculated using the same methodology.

Changes in RIS 2021 methodology

The RIS 2021 follows the revised methodology of the EIS 2021 and uses data for 240 regions across Europe for 21 of the 32 indicators used in the EIS 2021. Compared to the RIS 2019, regional coverage has changed for Croatia from two to four regions following a revision from the 2016 edition to the 2021 edition of the NUTS classification. Compared to the RIS 2019, four new indicators have been included: Individuals who have above basic overall digital skills, Innovation expenditures per person employed, Employed ICT specialists, and Air emissions in fine particulates (PM2.5) in Industry.



0 200 400 600 800 km

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 05/2021

- Emerging Innovator -
- Emerging Innovator
- Emerging Innovator +
- Moderate Innovator -
- Moderate Innovator
- Moderate Innovator +
- Strong Innovator -
- Strong Innovator
- Strong Innovator +
- Innovation Leader -
- Innovation Leader
- Innovation Leader +

For Cyprus, Estonia, Latvia, Luxembourg and Malta, performance group membership is identical to that in the EIS 2021 report. For these countries, the corresponding colour codes for the middle sub-group of regions have been used.

1. Introduction

The 2021 Regional Innovation Scoreboard (RIS) is a regional extension of the 2021 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 – 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 is as important as measuring innovation performance for countries. However, much less data are available at the regional level than for countries. The lack of regional data is making it more difficult to measure the innovation performance of regions. In particular regional data on innovation activities using data from the Community Innovation Survey (CIS) are not available for most countries. For the RIS regional CIS data have been made available by most National Statistical Offices, improving overall data availability to 21 indicators of the 32 indicators used in the EIS. Regional innovation performance is measured using a composite indicator – the Regional Innovation Index (RII) – which summarizes the performance on these 21 indicators. The RIS 2021 implements the revised measurement framework of the EIS 2021.

Section 2 discusses the availability of regional data, the indicators that are used for constructing the Regional Innovation Index, and the regions which are included in the RIS 2021. Section 2 also discusses the indicators that will be included in the regional profiles to identify structural differences between regions. Annex 4 provides an example of a regional profile for Brussels. Profiles for all 240 regions are available on the RIS website: http://ec.europa.eu/growth/industry/innovation/facts-figures/regional_en.

Section 3 presents results for the Regional Innovation Index and group membership in four distinct regional innovation performance groups. Section 3 also discusses performance trends over time. Section 4 shows performance maps and the best performing regions for each indicator. Section 5 discusses the full methodology for calculating the Regional Innovation Index and for imputing missing 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 2021, most recent data refer to 2020 for two indicators, 2019 for eight indicators, and 2018 for 11 indicators. A reference to the most recent performance year, RII2021, in this report should be interpreted as referring to data about two years older than the 2021 reference year. With data for most indicators from 2019 or before, the RIS 2021 results will not reflect the impact of the COVID-19 pandemic.

Table 1: Measurement framework of the 2021 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	
	2.2.1 Enterprises providing training to develop or upgrade ICT skills of their personnel
	2.2.2 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

2. RIS indicators, regions and data availability

This chapter discusses the indicators used in the Regional Innovation Scoreboard 2021 (section 2.1), the regional coverage (section 2.2), regional data availability (section 2.3), and the indicators selected for the regional profiles to highlight possible structural differences between regions (section 2.4).

2.1 Indicators

In the RIS, regional innovation performance should ideally be measured using the full 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 indicators used in the EIS (Table 2). For the following nine indicators, 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 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[1].

- 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 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 *Design applications*, the EIS uses data on individual design applications, for which regional data are not available. The RIS uses data on design applications, where a design application can include more than one individual design application.

- 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.

- For *Air emissions in fine particulates* (PM2.5) *in Industry*, regional data are not available, and instead data on Exposure to fine particulates (PM2.5) have been used.

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 more detail in **Annex 1**.

[1] 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 2021 Methodology Report.

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

	EIS 2021	RIS 2021
FRAMEWORK CONDITIONS		
Human resources	*Doctorate graduates per 1,000 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*

2.2 Regional coverage

The Regional Innovation Scoreboard covers 240 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, except for Norway for which the NUTS 2016 classification is used.

Depending on differences in regional data availability, the RIS covers 47 NUTS 1 regions and 193 NUTS 2 regions (**Table 3**). 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 performance levels relative to the EU27 scores from the EIS 2021 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 more than 67 million) is 4.8 million, whereas it is 2.8 million for an average NUTS 2 region in Italy (total population close to 59.5 million). The average unit of regional innovation performance analysis is 1.7 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.

Table 3: NUTS 1 and NUTS 2 regions included in RIS 2021 by country

COUNTRY		NUMBER OF REGIONS AT NUTS LEVEL		AVERAGE POPULATION SIZE (2020)	REGIONS (NUTS CODE)	
		1	2			
EU MEMBER STATES						
BE	Belgium	3		3,840,800	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	Vlaams Gewest (BE2) Région wallonne (BE3)
BG	Bulgaria		6	1,158,600	Severozapaden (BG31) Severen tsentralen (BG32) Severoiztochen (BG33)	Yugoiztochen (BG34) Yugozapaden (BG41) Yuzhen tsentralen (BG42)
CZ	Czechia		8	1,336,700	Praha (CZ01) Střední Čechy (CZ02) Jihozápad (CZ03) Severozápad (CZ04)	Severovýchod (CZ05) Jihovýchod (CZ06) Střední Morava (CZ07) Moravskoslezsko (CZ08)
DK	Denmark		5	1,164,600	Hovedstaden (DK01) Sjælland (DK02) Syddanmark (DK03)	Midtjylland (DK04) Nordjylland (DK05)

Table 3: NUTS 1 and NUTS 2 regions included in RIS 2021 by country

COUNTRY		NUMBER OF REGIONS AT NUTS LEVEL		AVERAGE POPULATION SIZE (2020)	REGIONS (NUTS CODE)	
		1	2			
EU MEMBER STATES						
DE	Germany	9	29	2,188,600	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	1,654,800	Northern and Western (IE04) Southern (IE05)	Eastern and Midland (IE06)
EL	Greece	1	12	824,500	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	2,491,200	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)

Table 3: NUTS 1 and NUTS 2 regions included in RIS 2021 by country

COUNTRY		NUMBER OF REGIONS AT NUTS LEVEL		AVERAGE POPULATION SIZE (2020)	REGIONS (NUTS CODE)	
		1	2			
EU MEMBER STATES						
FR	France	14		4,808,600	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	1,014,500	Panonska Hrvatska (HR02) Jadranska Hrvatska (HR03)	Grad Zagreb (HR05) Sjeverna Hrvatska (HR06)
IT	Italy		21	2,840,100	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	1,397,000	Sostinės regionas (LT01)	Vidurio ir vakarų Lietuvos regionas (LT02)
HU	Hungary		8	1,221,200	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	1,450,600	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		2,967,000	Ostösterreich (AT1) Südösterreich (AT2)	Westösterreich (AT3)
PL	Poland		17	2,232,800	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)

Table 3: NUTS 1 and NUTS 2 regions included in RIS 2021 by country

COUNTRY		NUMBER OF REGIONS AT NUTS LEVEL		AVERAGE POPULATION SIZE (2020)	REGIONS (NUTS CODE)	
		1	2			
EU MEMBER STATES						
PT	Portugal	2	5	1,470,800	Norte (PT11) Algarve (PT15) Centro (PT16) Lisboa (PT17) Alentejo (PT18)	Região Autónoma dos Açores (PT2) Região Autónoma da Madeira (PT3)
RO	Romania		8	2,416,100	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	1,047,900	Vzhodna Slovenija (SI03)	Zahodna Slovenija (SI04)
SK	Slovakia		4	1,364,500	Bratislavský kraj (SK01) Západné Slovensko (SK02)	Stredné Slovensko (SK03) Východné Slovensko (SK04)
FI	Finland	1	4	1,105,100	Helsinki-Uusimaa (FI1B) Helsinki-Uusimaa (FI1C) Etelä-Suomi (FI19)	Pohjois- ja Länsi-Suomi (FI1D) Åland (FI2)
SE	Sweden		8	1,290,900	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		7	766,800	Oslo og Akershus (NO01) Hedmark og Oppland (NO02) Sør-Østlandet (NO03) Agder og Rogaland (NO04)	Vestlandet (NO05) Trøndelag (NO06) Nord-Norge (NO07)
CH	Switzerland		7	1,229,400	Région lémanique (CH01) Espace Mittelland (CH02) Nordwestschweiz (CH03) Zürich (CH04)	Ostschweiz (CH05) Zentralschweiz (CH06) Ticino (CH07)
RS	Serbia[2]		4	1,731,700	Belgrade (RS11) Vojvodina (RS12	Šumadija and Western Serbia (RS21) Southern and Eastern Serbia (RS22)
UK	United Kingdom	12		5,598,200	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)

[2] The NUTS codes for Serbia are not official codes as Eurostat and Serbia have not yet agreed on statistical regions but are used for ease of reference in the RIS 2021 and for producing the regional maps.

2.3 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 and 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. For the three indicators using bibliometric data, Trademark applications and Design applications, regional data have been calculated and provided by Science-Metrix as part of a contract with the European Commission (DG Research and Innovation).

For three EIS indicators either alternative indicators or estimates have been used. For Individuals who have above basic overall digital skills, estimates are calculated using the variation in regional performance on Households with broadband access, for which data are available from Eurostat. For Employed ICT specialists, estimates are calculated using the variation in regional performance on Employment in information and communication (NACE J), for which data are available from Eurostat. For Employment in knowledge-intensive activities as percentage of total employment alternative data are used for Employment in medium-high and high-tech manufacturing and knowledge-intensive services, 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 made available by the European Environment Agency (EEA).

Regional CIS data request

To collect regional CIS data, data requests were made by Eurostat in 2021 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, and to Norway. Additional regional data requests were made by UNU-MERIT to the National Statistical Offices of Serbia and the United Kingdom.

Regional CIS 2018 data have been made available for 24 countries: Austria, Belgium, Bulgaria, Croatia, Czechia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain and Sweden. No regional CIS 2018 data have been made available for Denmark, the Netherlands, Slovenia, and the United Kingdom, and for these countries the same national data have been used for all regions. For Switzerland the most recent survey is from 2016. In addition, the statistical office of Croatia also shared revised regional CIS 2016 data following the revision of the NUTS classification for Croatia increasing the number of NUTS 2 regions from 2 to 4[3]. Regional data have been obtained for 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 new-to-market and new-to-enterprise product innovations 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, and to minimise this risk, the regional CIS data excludes large enterprises (which are more likely to have multiple establishments in different regions) and focuses on SMEs only. More details are available in the RIS 2021 Methodology Report.

Timeliness of regional data

For the RIS 2021, most recent data refer to 2020 for two indicators (International scientific co-publications, Public-private co-publications), 2019 for eight indicators (Population with tertiary education, Lifelong learning, Digital skills, Employed ICT specialists, PCT patent applications, Trademark applications, Design applications, Employment in knowledge-intensive activities), and 2018 for 11 indicators (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 2021, 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 biannual report, and as the one of the main data sources, the Community Innovation Survey produces new data once every two years, the RIS 2021 presents a Regional Innovation Index (RII) for four reference years:

- RII2021 using regional CIS 2018 data and the most recent data available on 13 April 2021
- RII2019 using data two years less timely than those used for the RII2021, including regional CIS 2016 data
- RII2017 using data four years less timely than those used for the RII2021, including regional CIS 2014 data
- RII2015 using data six years less timely than those used for the RII2021, including regional CIS 2012 data

[3] In the NUTS 2016 classification there are two NUTS 2 regions for Croatia: *Jadranska Hrvatska* (HR03) and *Kontinentalna Hrvatska* (HR04). In the NUTS 2021 classification the latter region has been split into three new regions: *Panonska Hrvatska* (HR02), *Grad Zagreb* (HR05), and *Sjeverna Hrvatska* (HR06).

Table 4: Regional data availability by indicator

	Data availability most recent year
Population aged 25-34 having completed tertiary education	99.6% (no data for FI2)
Population aged 25-64 participating in lifelong learning	100%
International scientific co-publications	98.8% (no data for 3 regions in HR)
Most-cited scientific publications	98.8% (no data for 3 regions in HR)
Individuals who have above basic overall digital skills	74.2% (no data for NUTS2 regions in DE, EL, PL; FI2)
R&D expenditures in the public sector	71.3% (no data for most regions in AT, BE, CH, DK, FR, IE, HR, NL, NO, PL, SE)
R&D expenditures in the business sector	67.1% (no data for most regions in AT, BE, CH, DK, FR, IE, HR, NL, NO, PL, SE)
Non-R&D innovation expenditures	84.2% (no data for all regions in CH, DK, NL, SI, UK)
Innovation expenditures per person employed	75.4% (no data for all regions in CH, DK, IT, NL, SI, UK)
Employed ICT specialists	100%
SMEs with product innovations	84.2% (no data for all regions in CH, DK, NL, SI, UK)
SMEs with business process innovations	84.2% (no data for all regions in CH, DK, NL, SI, UK)
Innovative SMEs collaborating with others	84.2% (no data for all regions in CH, DK, NL, SI, UK)
Public-private co-publications	98.8% (no data for 3 regions in HR)
PCT patent applications	95.0% (no data for regions in HR, IE, RS)
Trademark applications	98.8% (no data for 3 regions in HR)
Design applications	98.8% (no data for 3 regions in HR)
Employment in knowledge-intensive activities	98.8% (no data for 3 regions in HR)
Employment in innovative SMEs	84.2% (no data for all regions in CH, DK, NL, SI, UK)
Sales of new-to-market and new-to-enterprise innovations	84.2% (no data for all regions in CH, DK, NL, SI, UK)
Air emissions in fine particulates (PM2.5) in Industry	98.3% (no data for ES7, FRY, PT2, PT3)

Data availability by indicator

For the most recent year, data availability is 89.4% with regional data being available for 4,508 out of a maximum of 5,040 observations. Data availability differs by indicator, with highest data availability for Lifelong learning and Employed ICT specialists (**Table 4**). Data availability is below average for Individuals who have above basic overall digital skills, R&D expenditures in the public sector, R&D expenditures in the business sector, and all seven indicators using CIS data.

Imputations for missing data

The full RIS 2021 database contains 40,320 data cells (240 regions, 21 indicators, and 8 years). To improve data availability, several imputation techniques have been used to provide estimates for all missing data. Chapter 5 on the RIS methodology provides more details on the imputation techniques. Data availability after imputation improves to 99.1% with data missing for only 172 data cells. For some observations, data could not be imputed:

- Population having completed tertiary education: 1 region (FI2)
- Non-R&D innovation expenditures: all 7 Swiss regions
- Innovation expenditures per person employed in SMEs: 12 regions (ES63, ES64, ITC2, ITC3, FI2, all 7 Swiss regions)
- Employment in innovative enterprises: 12 regions (ES63, ES64, ITC2, ITC3, FI2, all 7 Swiss regions)
- Sales of new-to-market and new-to-enterprise innovations: all 7 Swiss regions
- Air emissions in fine particulates (PM2.5) in Industry: 4 regions (ES7, FRY, PT2, PT3)

2.4 Structural differences

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 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 will for each region include, when data are available from Eurostat, data on the composition of regional employment, using average employment shares for the years 2015-2019, 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, in urbanised areas there tends to be a concentration of government and educational services. These 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 population size and GDP per capita, measured in purchasing power standards[4], which is a better measure for interpreting real income differences between regions.

[4] 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.

3. Regional innovation performance

3.1 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 38 regions performing above 125% of the EU average.
- The group of Strong Innovators includes 67 regions performing between 100% and 125% of the EU average.
- The group of Moderate Innovators includes 68 regions performing between 70% and 100% of the EU average.
- The group of Emerging Innovators includes 67 regions performing below 70% of the EU average.

Higher performance groups score better on individual indicators

The most innovative regions, on average, perform best on most of the indicators as shown in the radar graph below (**Figure 1**), where the line for the Emerging Innovators is largely embedded within the line for the Moderate Innovators, which is itself largely embedded within the line for the Strong Innovators. The line for the Innovation Leaders shows that these regions, on average, have the highest performance on 19 indicators, except on Non-R&D innovation expenditures and in Sales of new-to-market and new-to-enterprise innovations, where the Strong Innovators have the highest average performance (**Figure 1** and **Table 5**)[5].

The Innovation Leaders perform particularly well, with average performance levels of 60% or more above the EU average: on Business R&D expenditures (214%), Employed ICT specialists (179%), PCT patent applications (176%), Public R&D expenditures (170%), Lifelong learning (165%), Trademark applications (163%), and Public-private co-publications (163%).

The Strong Innovators perform above average on all indicators. For six indicators performance is 25% or more above the EU average: Innovative SMEs collaborating with others (134%), Lifelong learning (132%), Employment in innovative SMEs (132%), PCT patent applications (132%), and Individuals who have above basic overall digital skills (128%).

The Moderate Innovators perform above the EU average on five indicators, all of them using data from the CIS. SMEs with business process innovations (109%), Sales of new-to-market and new-to-enterprise innovations (107%), Non-R&D innovation expenditures (107%), SMEs with product innovations (103%), and Employment in innovative SMEs (102%). For five indicators performance is below 90% of the EU average: R&D expenditures in the business sector (80%), PCT patent applications (84%), Employed ICT specialists (84%), Lifelong learning (89%) and Individuals who have above basic overall digital skills (90%).

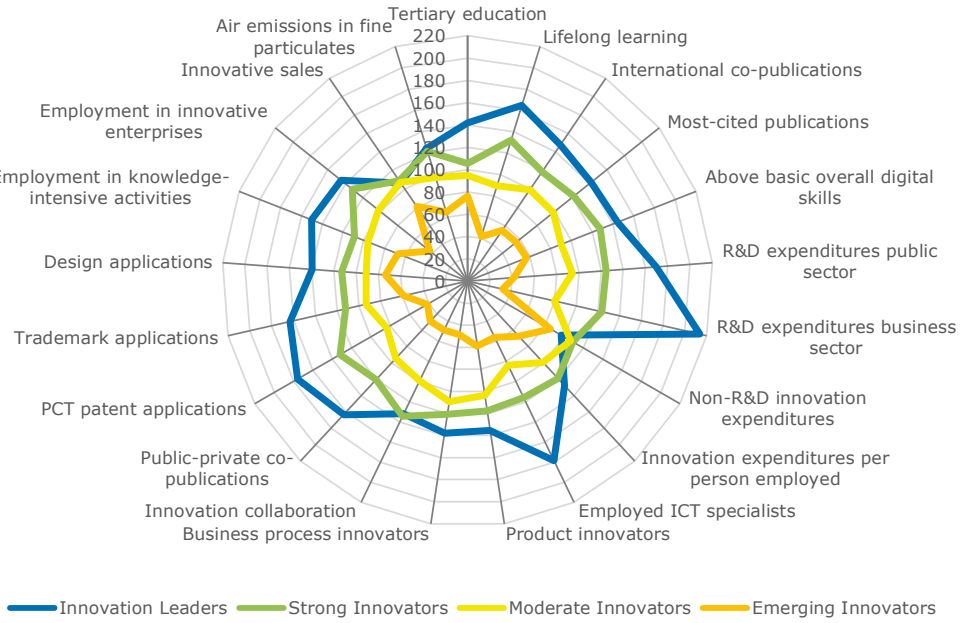
The Emerging Innovators perform below the EU average on all indicators, and for eight indicators performance is below 50% of the EU average: R&D expenditures in the business sector (32%), PCT patent applications (42%), R&D expenditures in the public sector (42%), Lifelong learning (42%), Employment in innovative SMEs (43%), Innovative SMEs collaborating with others (48%), SMEs with business process innovations (49%), and Public-private co-publications (49%). For four indicators performance is above 70% of the EU average: Non-R&D innovation expenditures (86%), Sales of new-to-market and new-to-enterprise innovations (81%), Population aged 25-34 having completed tertiary education (76%), and Design applications (74%).

Most regions perform close to the average performance of their country but there are also 'pockets of excellence'

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 identified as Innovation Leaders or Strong Innovators in the EIS 2021. All regional Innovation Leaders belong to 10 countries. Most regional Strong Innovators belong to EIS Innovation Leader and Strong Innovator countries, only 11 regional Strong Innovators belong to EIS Moderate Innovator countries (of which seven in Italy). Most regional Moderate Innovators belong to EIS Moderate Innovator countries (57% of the regions in this regional innovation performance group), but a significant number of regions belong to the EIS Strong Innovators (31%). Almost all (97%) regional Emerging Innovators belong to EIS Moderate Innovator and Emerging Innovator countries. Regional 'pockets of excellence' can be identified in some Moderate and Emerging Innovator countries, mostly highly urbanised regions including the country's capital city: *Yugozapaden (Sofia)* in Bulgaria is an Emerging Innovator +, *Praha (Prague)* in Czechia is a Strong Innovator -, *Attiki (Athens)* and *Kriti (Crete)* in Greece are Moderate Innovators, Budapest in Hungary is a Moderate Innovator +, *Warszawski stoleczny (Warsaw)* in Poland is a Moderate Innovator, *Bucuresti – Ilfov (Bucarest)* in Romania is an Emerging Innovator +, and *Bratislavský kraj (Bratislava)* in Slovakia is a Moderate Innovator. At the same time, some regions in EIS Innovation Leader and Strong Innovator countries perform in 'lower' performance groups, most notably *Sjælland* in Denmark, *Corse* and *Régions ultrapériphériques françaises* in France, and *Sør-Østlandet* and *Agder og Rogaland* in Norway.

[5] 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.

Figure 1: Average indicator scores by regional performance group



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.[6] The correction makes sure that this average is equal to the EU average of 100. Full details are provided in the RIS 2021 Methodology Report.

Table 5: Average indicator scores by regional performance group

	Innovation Leaders	Strong Innovators	Moderate Innovators	Emerging Innovators
Population aged 25-34 having completed tertiary education	142	105	95	76
Population aged 25-64 participating in lifelong learning	165	132	89	42
International scientific co-publications	148	118	99	55
Most-cited scientific publications	142	122	99	56
Individuals who have above basic overall digital skills	145	128	90	57
R&D expenditures in the public sector	170	125	94	42
R&D expenditures in the business sector	214	124	80	32
Non-R&D innovation expenditures	97	109	107	86
Innovation expenditures per person employed	128	119	99	68
Employed ICT specialists	179	116	84	56
SMEs with product innovations	135	118	103	59
SMEs with business process innovations	138	121	109	49
Innovative SMEs collaborating with others	132	134	99	48
Public-private co-publications	163	121	95	49
PCT patent applications	176	132	84	42
Trademark applications	163	112	93	59
Design applications	140	113	91	74
Employment in knowledge-intensive activities	150	109	96	67
Employment in innovative SMEs	145	132	102	43
Sales of new-to-market and new-to-enterprise innovations	107	109	107	81
Air emissions in fine particulates (PM2.5) in Industry	125	122	97	65

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. The correction makes sure that this average is equal to the EU average of 100. Full details are provided in the RIS 2021 Methodology Report.

[6] 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 is 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.

Providing more detail: defining 12 performance sub-groups

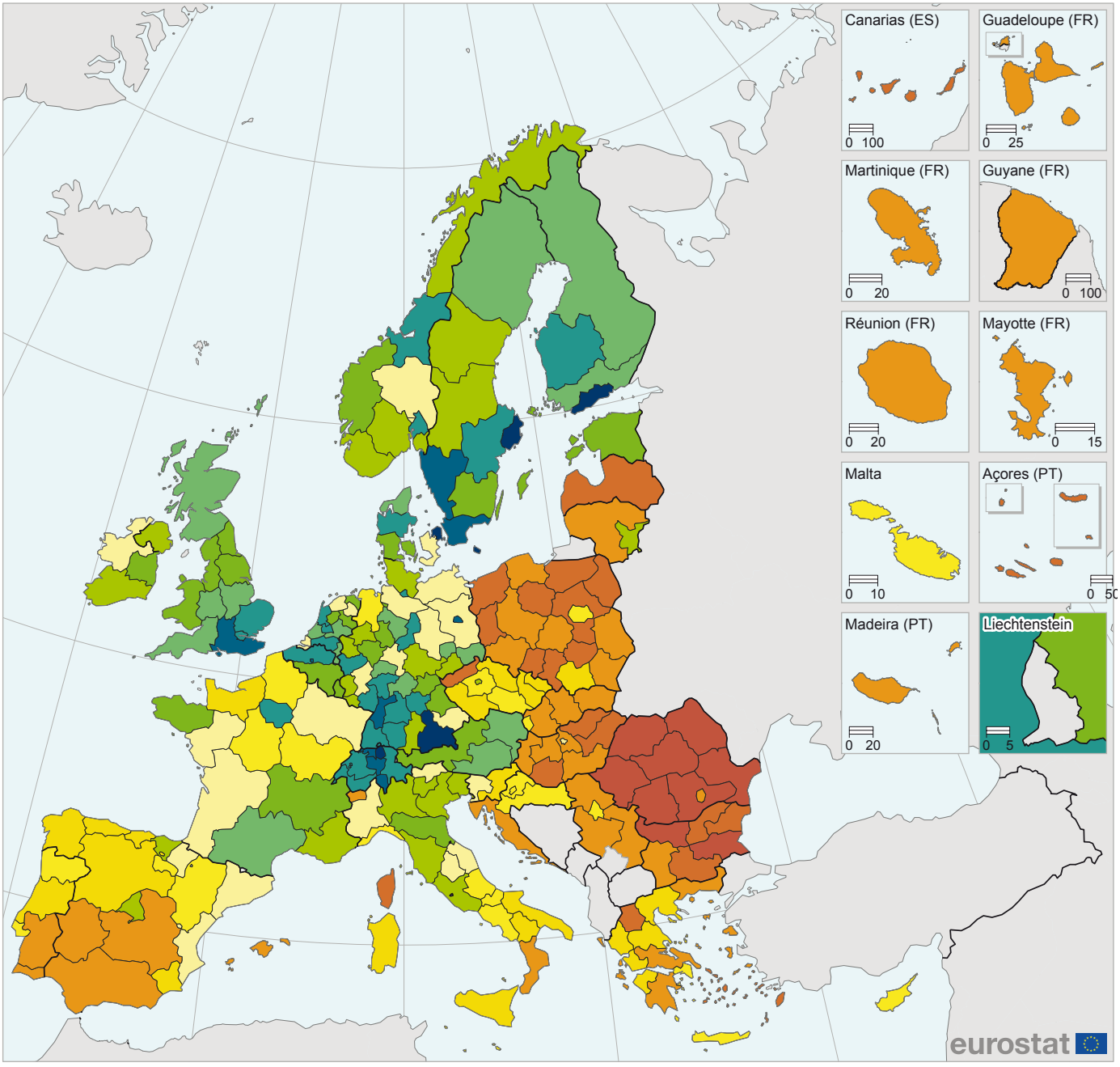
For most countries, there is limited variation in regional performance groups. Only in Czechia, Denmark, Germany, Italy, the Netherlands, and Spain, there are three different regional performance groups and in France and Norway there are four different regional performance groups. In 13 countries, there are two different regional performance groups, and in Austria, Bulgaria, Romania, Slovenia, and Switzerland, all regions are in the same performance group.

The RIS 2017 introduced three subgroups within each performance group to allow for more diversity at the regional level: the top one-third regions (+), the middle one-third regions and the bottom one-third regions (-). For the RIS 2021, performance sub-groups are defined similar to the 4 main groups using performance thresholds based on dividing the performance range in each group in three equal parts.

Table 6: Defining performance sub-groups

GROUP	TOP SUB-GROUP (+)	MIDDLE SUB-GROUP	BOTTOM SUB-GROUP (-)
Innovation Leaders	Innovation Leaders + Above 144.8% above EU average	Innovation Leaders Between 134.9% and 144.8% of EU average	Innovation Leaders - Between 125% and 134.9% 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 52.1% and 70% of EU average	Emerging Innovators Between 34.1% and 52.1% of EU average	Emerging Innovators – Below 34.1% of EU average

Figure 2: Regional performance groups



For Cyprus, Estonia, Latvia, Luxembourg and Malta, performance group membership is identical to that in the EIS 2021 report. For these countries, the corresponding colour codes for the middle sub-group of regions have been used.

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 2**:

- 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 there are nine different performance subgroups, in Germany there are eight different performance subgroups, in Spain there are seven different performance subgroups, in Italy and Sweden there are six different performance subgroups, in Denmark and the United Kingdom there are five different performance subgroups, and in Czechia, Finland, Greece, the Netherlands, Norway, Portugal, and Poland there are four different performance subgroups.

Table 7: Occurrence of regional performance groups by country

	Performance group EIS 2021	Regional Innovation Leaders			Regional Strong Innovators			Regional Moderate Innovators			Regional Emerging Innovators		
		+		-	+		-	+		-	+		-
		5	**9**	**24**	**19**	**22**	**26**	**25**	**22**	**21**	**35**	**22**	**10**
Switzerland	Innovation Leader	1	3	3									
Sweden	Innovation Leader	1	2	1	1	1	2						
Finland	Innovation Leader	1		1	2	1							
Denmark	Innovation Leader	1		1	1	1		1					
Belgium	Innovation Leader		1	1		1							
Netherlands	*Strong Innovator*			3	3	3		3					
United Kingdom	Strong Innovator		1	2	4	4	1						
Germany	Strong Innovator	1	2	9	5	5	8	7	1				
Luxembourg	*Strong Innovator*												
Austria	Strong Innovator				2	1							
Norway	Strong Innovator			2		1	3	1					
Estonia	*Strong Innovator*												
Ireland	Strong Innovator					1	1	1					
France	*Strong Innovator*			1	1	2	1	3	3	1	1	1	
Italy	Moderate Innovator					1	6	4	4	4	2		
Cyprus	*Moderate Innovator*												
Malta	*Moderate Innovator*												
Slovenia	*Moderate Innovator*							1		1			
Spain	*Moderate Innovator*						2	3	2	5	4	2	1
Czechia	Moderate Innovator						1		2	4		1	
Lithuania	Moderate Innovator						1				1		
Portugal	Moderate Innovator								2	1	3	1	
Greece	Moderate Innovator								2	4	5	2	
Croatia	Emerging Innovator								3		1		
Hungary	Emerging Innovator							1			4	3	
Serbia	*Emerging Innovator*								1		3		
Slovakia	Emerging Innovator								1		3		
Poland	Emerging Innovator								1	1	6	9	
Latvia	*Emerging Innovator*												
Bulgaria	Emerging Innovator										1	3	2
Romania	Emerging Innovator										1		7

Countries ordered by their performance score in the European Innovation Scoreboard 2021.

3.2 Ranking of regions

The most innovative region overall and in the EU is *Stockholm* (SE11) in Sweden, followed by *Helsinki-Uusimaa* (FI1B) in Finland, *Oberbayern* (DE21) in Germany, *Hovedstaden* (DK01) in Denmark and *Zürich* (CH04) in Switzerland (**Table 8**). Of the top-10 regions three each are from Germany and Switzerland, two from Sweden, and one each from Denmark, Finland, and the United Kingdom. *Zürich* (CH04) was the most innovative region in 2017 and 2019, and *Hovedstaden* (DK01) was the most innovative region in 2015.

Seven out of the top-25 regions in 2021 are from Germany and six are from Switzerland, four from Sweden, two each from Denmark Finland, and the United Kingdom, and one each from Belgium and Norway. The top-25 regions in 2019 are also from one of these nine countries plus two regions from the Netherlands and one from France. In 2015 and 2017 the top-25 regions are also from these countries.

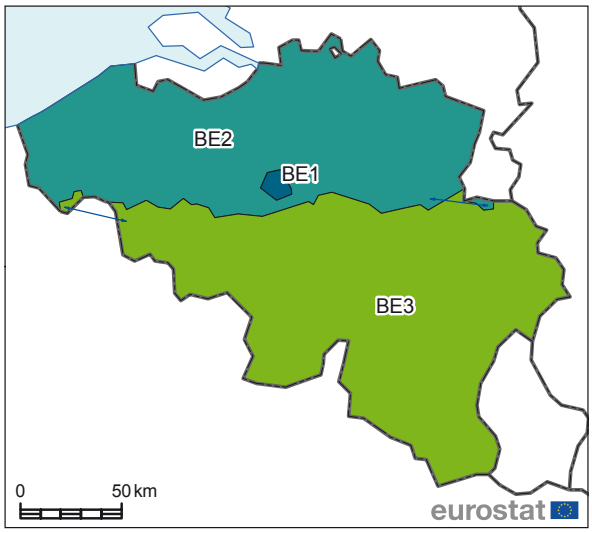
Table 8: Top-25 Regional Innovation Leaders

	2021	2019	2017	2015	RII2021
1	Stockholm (SE11)	Zürich (CH04)	Zürich (CH04)	Hovedstaden (DK01)	154.5
2	Helsinki-Uusimaa (FI1B)	Stockholm (SE11)	Hovedstaden (DK01)	Zürich (CH04)	151.7
3	Oberbayern (DE21)	Hovedstaden (DK01)	Stockholm (SE11)	Stockholm (SE11)	151.1
4	Hovedstaden (DK01)	Helsinki-Uusimaa (FI1B)	Nordwestschweiz (CH03)	Nordwestschweiz (CH03)	149.0
5	Zürich (CH04)	Ticino (CH07)	Région lémanique (CH01)	Oberbayern (DE21)	146.4
6	Karlsruhe (DE12)	Berlin (DE3)	Oberbayern (DE21)	Karlsruhe (DE12)	144.0
7	Berlin (DE3)	Oberbayern (DE21)	Helsinki-Uusimaa (FI1B)	Helsinki-Uusimaa (FI1B)	143.8
8	Ticino (CH07)	Karlsruhe (DE12)	Ticino (CH07)	Région lémanique (CH01)	142.7
9	Sydsverige (SE22)	Nordwestschweiz (CH03)	Île de France (FR1)	Berlin (DE3)	141.8
10	Nordwestschweiz (CH03)	Zentralschweiz (CH06)	South East (UKJ)	Sydsverige (SE22)	138.1
11	Västsverige (SE23)	Région lémanique (CH01)	Sydsverige (SE22)	Midtjylland (DK04)	137.8
12	South East (UKJ)	South East (UKJ)	Karlsruhe (DE12)	Ostschweiz (CH05)	137.6
13	Zentralschweiz (CH06)	Ostschweiz (CH05)	London (UKI)	Ticino (CH07)	136.0
14	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	London (UKI)	Berlin (DE3)	Île de France (FR1)	135.1
15	Tübingen (DE14)	Utrecht (NL31)	Zentralschweiz (CH06)	Zentralschweiz (CH06)	134.7
16	Braunschweig (DE91)	Espace Mittelland (CH02)	Ostschweiz (CH05)	Västsverige (SE23)	134.6
17	Oslo og Akershus (NO01)	Sydsverige (SE22)	Tübingen (DE14)	Tübingen (DE14)	134.3
18	Ostschweiz (CH05)	Västsverige (SE23)	Västsverige (SE23)	London (UKI)	133.8
19	Rheinhessen-Pfalz (DEB3)	Noord-Holland (NL32)	Utrecht (NL31)	Hamburg (DE6)	133.8
20	Région lémanique (CH01)	Oslo og Akershus (NO01)	East of England (UKH)	Utrecht (NL31)	133.6
21	Hamburg (DE6)	Tübingen (DE14)	Noord-Holland (NL32)	Östra Mellansverige (SE12)	133.3
22	London (UKI)	Île de France (FR1)	Midtjylland (DK04)	Stuttgart (DE11)	133.0
23	Östra Mellansverige (SE12)	Östra Mellansverige (SE12)	Trøndelag (NO06)	Braunschweig (DE91)	132.8
24	Midtjylland (DK04)	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	Östra Mellansverige (SE12)	South East (UKJ)	132.2
25	Länsi-Suomi (FI19)	Midtjylland (DK04)	Oslo og Akershus (NO01)	Freiburg (DE13)	130.7

3.3 Regional performance within countries

This section summarizes for each country the performance of the regions within that country. For each country, a map is included showing the location of the regions in that country. Regions that include the country's capital city are highlighted in bold.

BELGIUM



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

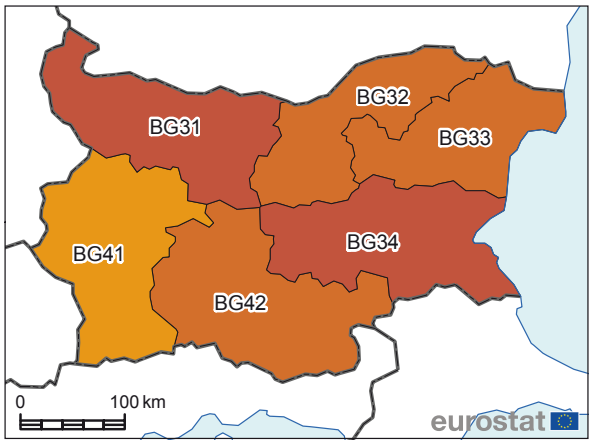
NUTS	Region	RII	Rank	Group	Change
BE1	**Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest**	135.1	14	Leader	24.9
BE2	Vlaams Gewest	149.8	27	Leader -	21.0
BE3	Région wallonne	130.9	67	Strong	20.2

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Belgium is an Innovation Leader and includes three regions.

Région de Bruxelles-Capitale (BE1) is an Innovation Leader, *Vlaams Gewest* (BE2) *is* an Innovation Leader -, and *Région wallonne* (BE3) is a Strong Innovator. For all three regions, performance relative to the EU in 2014 has increased over time, and most strongly for *Région de Bruxelles-Capitale* (BE1).

BULGARIA



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

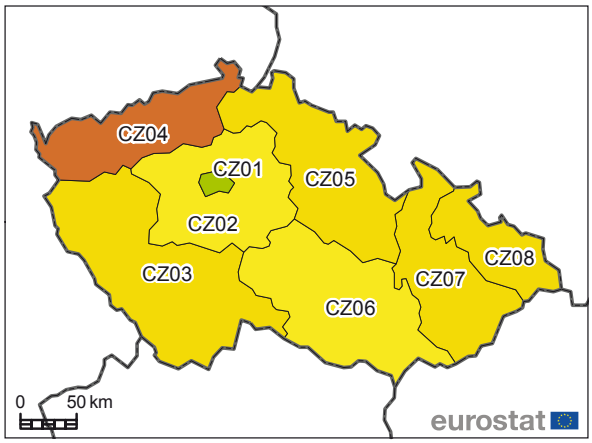
NUTS	Region	RII	Rank	Group	Change
BG31	Severozapaden	26.0	236	Emerging -	4.7
BG32	Severen tsentralen	34.9	230	Emerging	2.1
BG33	Severoiztochen	35.5	229	Emerging	8.4
BG34	Yugoiztochen	27.2	234	Emerging -	0.7
BG41	**Yugozapaden**	55.6	199	Emerging +	11.4
BG42	Yuzhen tsentralen	35.7	228	Emerging	6.2

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Bulgaria is an Emerging Innovator and includes six regions.

Yugozapaden (BG41), the capital region, is the only Emerging Innovator +. Innovation performance relative to the EU in 2014 has increased for all regions, and most strongly for *Yugozapaden* (BG41).

CZECHIA



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

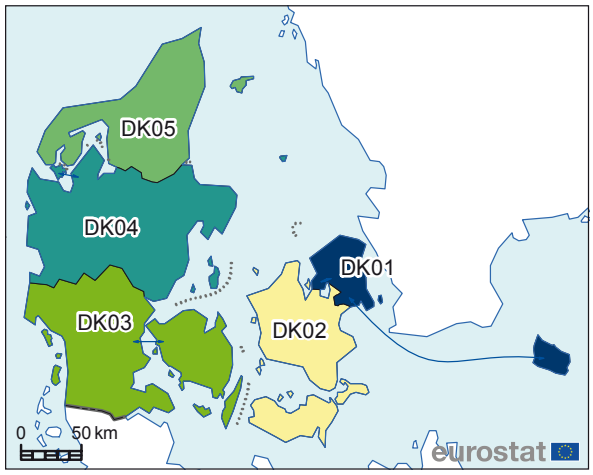
NUTS	Region	RII	Rank	Group	Change
CZ01	**Praha**	107.5	83	Strong -	15.9
CZ02	Střední Cechy	88.8	133	Moderate	23.8
CZ03	Jihozápad	74.0	165	Moderate -	8.2
CZ04	Severozápad	47.8	218	Emerging	-5.4
CZ05	Severovýchod	79.4	155	Moderate -	6.9
CZ06	Jihovýchod	88.6	134	Moderate	11.9
CZ07	Střední Morava	73.6	167	Moderate -	3.7
CZ08	Moravskoslezsko	74.8	162	Moderate -	20.0

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Czechia is a Moderate Innovator and includes eight regions.

Praha (CZ01), the capital region, is a Strong - Innovator, performing above the average performance of the EU. Six regions are Moderate Innovators, and one region is an Emerging Innovator. For seven regions performance relative to the EU has increased, most strongly for *Střední Cechy* (CZ02) and *Moravskoslezsko* (CZ08), and for one region performance relative to the EU has decreased.

DENMARK



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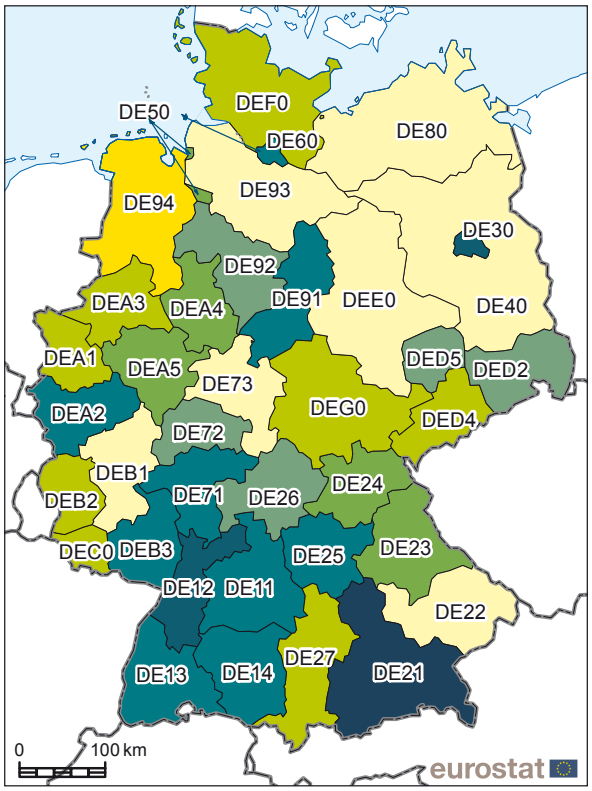
NUTS	Region	RII	Rank	Group	Change
DK01	**Hovedstaden**	149.0	4	Leader +	-4.0
DK02	Sjælland	99.1	107	Moderate +	-14.4
DK03	Syddanmark	109.0	78	Strong	-2.0
DK04	Midtjylland	132.2	24	Leader -	6.1
DK05	Nordjylland	116.9	56	Strong +	5.3

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

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 fourth most innovative region of all European regions. *Midtjylland* (DK04) is an Innovation Leader -. *Nordjylland* (DK05) is a Strong Innovator +, *Syddanmark* (DK03) is a Strong Innovator and *Sjælland* (DK02) is a Moderate Innovator +. Performance relative to the EU in 2014 has declined for three regions, most strongly for *Sjælland* (DK02). Performance has increased for *Midtjylland* (DK04) and *Nordjylland* (DK05).

GERMANY



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

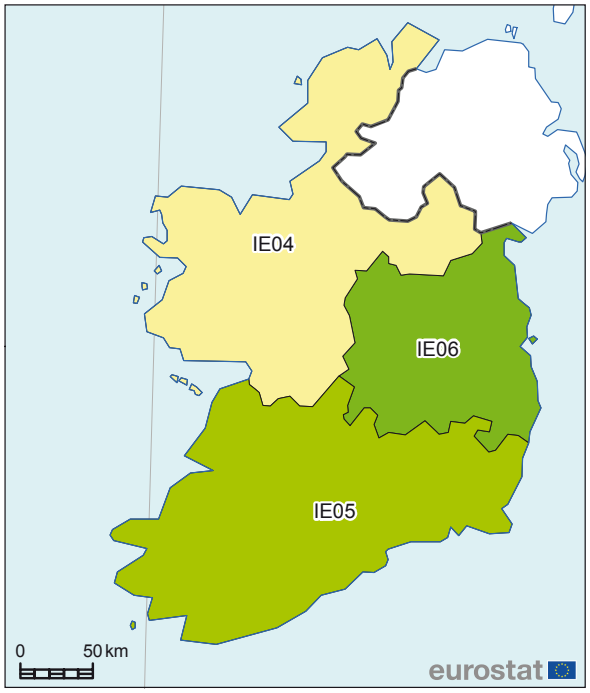
	Region	RII	Rank	Group	Change
DE11	Stuttgart	129.6	33	Leader -	8.0
DE12	Karlsruhe	144.0	6	Leader	7.1
DE13	Freiburg	126.0	38	Leader -	6.5
DE14	Tübingen	134.7	15	Leader -	9.1
DE21	Oberbayern	151.1	3	Leader +	14.6
DE22	Niederbayern	98.2	111	Moderate +	6.5
DE23	Oberpfalz	115.9	61	Strong	6.2
DE24	Oberfranken	111.1	72	Strong	3.8
DE25	Mittelfranken	128.5	35	Leader -	8.8
DE26	Unterfranken	119.9	48	Strong +	7.5
DE27	Schwaben	107.8	82	Strong -	6.1
DE3	**Berlin**	143.8	7	Leader	16.1
DE4	Brandenburg	95.9	119	Moderate +	-0.8
DE5	Bremen	112.8	69	Strong	2.3
DE6	Hamburg	133.3	21	Leader -	12.4
DE71	Darmstadt	128.2	37	Leader -	8.2
DE72	Gießen	123.8	40	Strong +	24.7
DE73	Kassel	98.8	110	Moderate +	1.4
DE8	Mecklenburg-Vorpommern	93.6	124	Moderate +	2.4
DE91	Braunschweig	134.6	16	Leader -	17.2
DE92	Hannover	117.4	53	Strong +	12.1
DE93	Lüneburg	91.1	129	Moderate +	-2.4
DE94	Weser-Ems	86.1	141	Moderate	3.3
DEA1	Düsseldorf	107.9	80	Strong -	5.8
DEA2	Köln	129.7	32	Leader -	11.4
DEA3	Münster	106.1	90	Strong -	4.0
DEA4	Detmold	116.6	58	Strong	18.7
DEA5	Arnsberg	110.2	74	Strong	10.2
DEB1	Koblenz	98.2	112	Moderate +	12.1
DEB2	Trier	100.5	103	Strong -	-5.2
DEB3	Rheinhessen-Pfalz	133.8	19	Leader -	15.0
DEC	Saarland	107.0	86	Strong -	6.4
DED2	Dresden	123.6	41	Strong +	6.2
DED4	Chemnitz	100.0	105	Strong -	9.8
DED5	Leipzig	117.7	51	Strong +	16.7
DEE	Sachsen-Anhalt	93.3	126	Moderate +	8.0
DEF	Schleswig-Holstein	107.8	81	Strong -	6.0
DEG	Thüringen	107.1	84	Strong -	7.3

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Germany is a Strong Innovator and includes 38 regions.

Oberbayern (DE21) is the most innovative region and third most innovative region in Europe. In total 12 regions are Innovation Leaders, 18 are Strong Innovators, and eight are Moderate Innovators. Performance relative to the EU in 2014 has increased for 35 regions, most strongly for *Gießen* (DE72). Performance has decreased for three regions, *Brandenburg* (DE4), *Lüneburg* (DE93), and *Trier* (DEB2).

IRELAND



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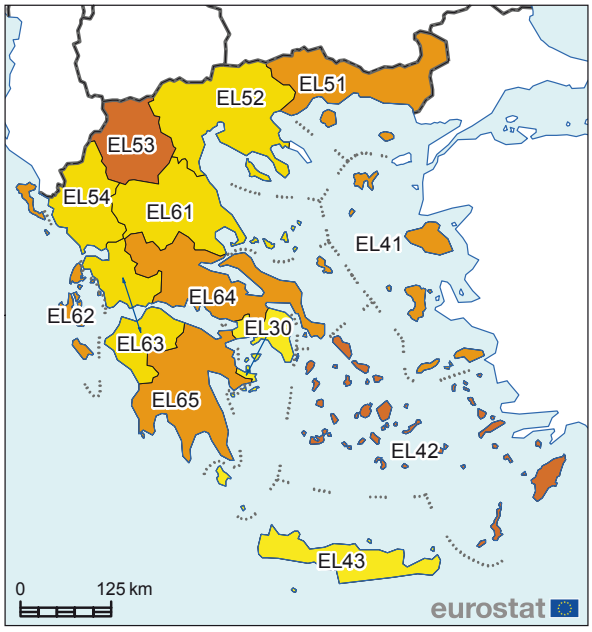
NUTS	Region	RII	Rank	Group	Change
IE04	Northern and Western	96.7	118	Moderate +	3.8
IE05	Southern	102.8	94	Strong -	2.9
IE06	**Eastern and Midland**	114.9	64	Strong	3.3

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Ireland is a Strong Innovator and includes three regions.

Two regions are Strong Innovators, *Southern* (IE05) and *Eastern and Midland* (IE06). *Northern and Western* (IE04) is a Moderate Innovator. Performance relative to the EU in 2014 has increased for all regions.

GREECE



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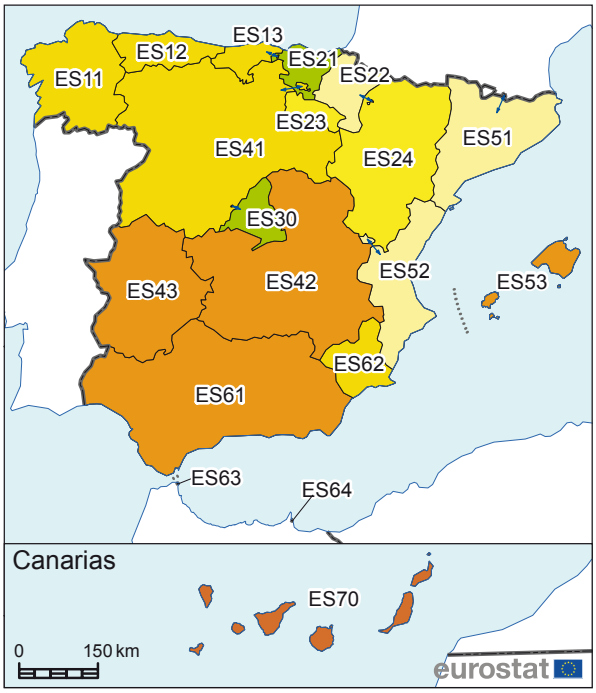
NUTS	Region	RII	Rank	Group	Change
EL3	**Attiki**	86.9	139	Moderate	27.3
EL41	Voreio Aigaio	63.4	185	Emerging +	26.2
EL42	Notio Aigaio	47.6	220	Emerging	15.6
EL43	Kriti	82.1	147	Moderate	24.8
EL51	Anatoliki Makedonia, Thraki	56.4	198	Emerging +	22.8
EL52	Kentriki Makedonia	77.8	158	Moderate -	30.0
EL53	Dytiki Makedonia	49.5	211	Emerging	12.2
EL54	Ipeiros	71.0	171	Moderate -	36.0
EL61	Thessalia	74.4	163	Moderate -	30.8
EL62	Ionia Nisia	60.2	189	Emerging +	35.6
EL63	Dytiki Ellada	71.8	169	Moderate -	23.9
EL64	Sterea Ellada	62.6	186	Emerging +	14.9
EL65	Peloponnisos	59.0	190	Emerging +	22.2

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Greece is a Moderate Innovator and includes 13 regions.

Attiki (EL3) and *Kriti* (EL43) are the two most innovative regions. In total there are six Moderate and seven Emerging Innovators. Performance relative to the EU in 2014 has increased for all regions, and most strongly for *Ipeiros* (EL54) and *Ionia Nisia* (EL62).

SPAIN



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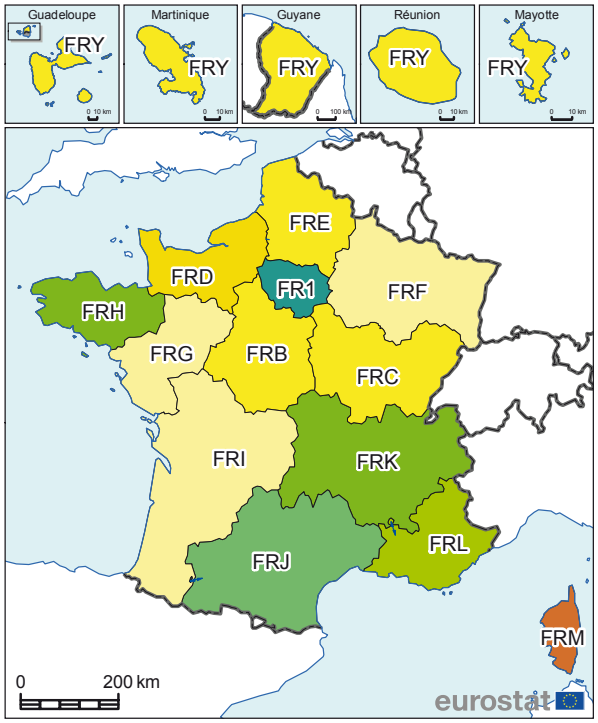
NUTS	Region	RII	Rank	Group	Change
ES11	Galicia	78.9	156	Moderate -	16.0
ES12	Principado de Asturias	73.7	166	Moderate -	8.9
ES13	Cantabria	73.5	168	Moderate -	9.5
ES21	País Vasco	103.6	93	Strong -	14.7
ES22	Comunidad Foral de Navarra	98.1	114	Moderate +	17.5
ES23	La Rioja	80.7	150	Moderate	7.9
ES24	Aragón	80.9	148	Moderate	9.1
ES3	**Comunidad de Madrid**	101.0	100	Strong -	13.7
ES41	Castilla y León	76.9	160	Moderate -	17.4
ES42	Castilla-la Mancha	64.4	183	Emerging +	12.3
ES43	Extremadura	61.1	188	Emerging +	14.1
ES51	Cataluña	98.9	108	Moderate +	16.9
ES52	Comunitat Valenciana	91.3	128	Moderate +	18.3
ES53	Illes Balears	67.4	178	Emerging +	9.9
ES61	Andalucía	67.5	177	Emerging +	10.6
ES62	Región de Murcia	76.3	161	Moderate -	17.5
ES63	Ciudad de Ceuta	33.6	231	Emerging -	4.2
ES64	Ciudad de Melilla	40.6	226	Emerging	12.5
ES7	Canarias	48.8	216	Emerging	10.7

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Spain is a Moderate Innovator and includes 19 regions.

Regional performance differences are high with the best performing region, *País Vasco* (ES21), performing three times as well as the lowest performing region, *Ciudad de Ceuta* (ES63). Two regions are Strong Innovators, 10 regions are Moderate Innovators, and seven regions are Emerging Innovators. Performance relative to the EU in 2014 has increased for all regions, and most strongly for *Comunitat Valenciana* (ES52).

FRANCE



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NUTS	Region	RII	Rank	Group	Change
FR1	**Île de France**	130.0	30	Leader -	2.2
FRB	Centre - Val de Loire	88.3	135	Moderate	-4.1
FRC	Bourgogne - Franche-Comté	89.6	132	Moderate	-4.9
FRD	Normandie	77.2	159	Moderate -	-8.5
FRE	Hauts-de-France	83.3	145	Moderate	3.6
FRF	Grand Est	94.4	123	Moderate +	3.1
FRG	Pays de la Loire	99.2	106	Moderate +	9.4
FRH	Bretagne	108.3	79	Strong	6.6
FRI	Nouvelle-Aquitaine	93.1	127	Moderate +	1.7
FRJ	Occitanie	117.2	54	Strong +	1.3
FRK	Auvergne - Rhône-Alpes	116.0	60	Strong	1.3
FRL	Provence-Alpes-Côte d'Azur	104.9	91	Strong -	4.2
FRM	Corse	47.8	219	Emerging	-3.2
FRY	Régions ultrapériphériques françaises	68.0	175	Emerging +	10.9

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

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 relative to the EU has improved for 10 regions, and strongest in *Régions ultrapériphériques françaises* (FRY). Performance relative to the EU in 2014 has decreased in four regions, most notably in *Normandie* (FRD).

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CROATIA

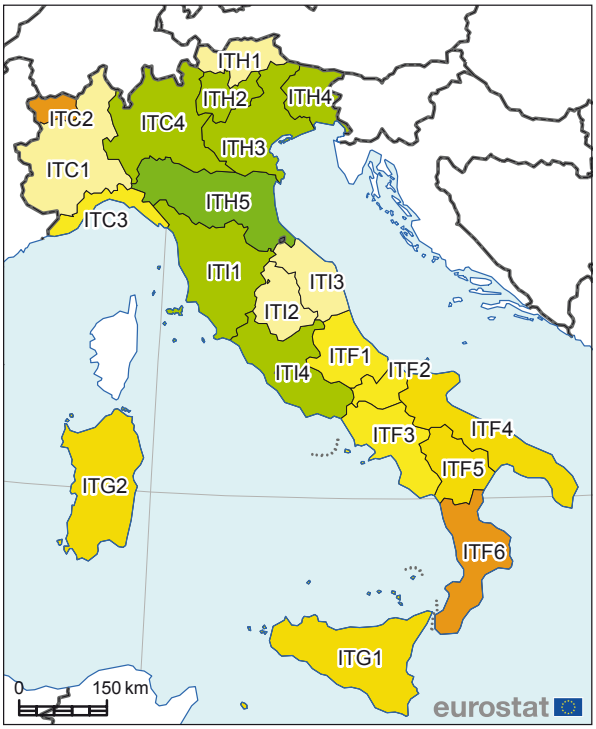
NUTS	Region	RII	Rank	Group	Change
HR02	Panonska Hrvatska	80.8	149	Moderate	22.9
HR03	Jadranska Hrvatska	62.6	187	Emerging +	23.0
HR05	**Grad Zagreb**	86.1	140	Moderate	26.0
HR06	Sjeverna Hrvatska	83.7	143	Moderate	21.4

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Croatia is an Emerging Innovator and includes four regions.

Three regions are Moderate Innovators, with the highest performance for *Grad Zagreb* (HR05). *Jadranska Hrvatska* (HR03) is an Emerging Innovator. Performance relative to the EU in 2014 has increased for all regions.

ITALY



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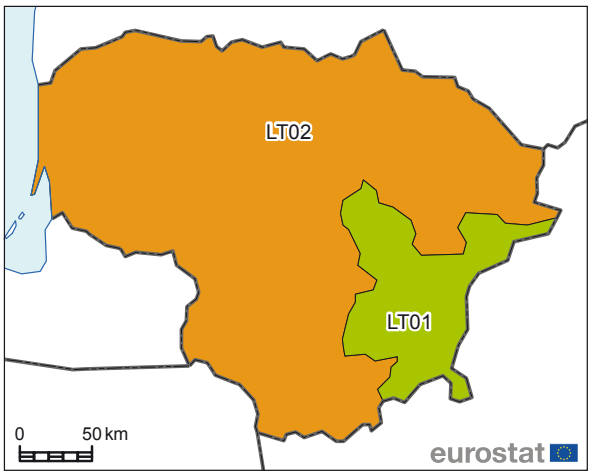
NUTS	Region	RII	Rank	Group	Change
ITC1	Piemonte	97.8	115	Moderate +	25.0
ITC2	Valle d'Aosta/ Vallée d'Aoste	67.4	179	Emerging +	14.7
ITC3	Liguria	88.3	136	Moderate	28.2
ITC4	Lombardia	102.3	97	Strong -	27.9
ITH1	Provincia Autonoma Bolzano/ Bozen	94.8	120	Moderate +	23.8
ITH2	Provincia Autonoma Trento	107.1	85	Strong -	29.8
ITH3	Veneto	102.8	95	Strong -	29.0
ITH4	Friuli-Venezia Giulia	106.6	89	Strong -	25.1
ITH5	Emilia-Romagna	109.4	76	Strong	34.2
ITI1	Toscana	101.3	98	Strong -	27.9
ITI2	Umbria	98.8	109	Moderate +	29.2
ITI3	Marche	90.6	130	Moderate +	26.6
ITI4	**Lazio**	100.4	104	Strong -	26.6
ITF1	Abruzzo	84.7	142	Moderate	22.7
ITF2	Molise	82.9	146	Moderate	26.4
ITF3	Campania	83.3	144	Moderate	30.0
ITF4	Puglia	74.1	164	Moderate -	21.6
ITF5	Basilicata	79.7	154	Moderate -	30.1
ITF6	Calabria	68.2	174	Emerging +	20.1
ITG1	Sicilia	70.3	173	Moderate -	21.9
ITG2	Sardegna	70.4	172	Moderate -	19.5

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Italy is a Moderate Innovator and includes 21 regions.

Regional performance differences are high in Italy with seven Strong Innovators, 12 Moderate and two Emerging Innovators. *Emilia-Romagna* (ITH5) is the most innovative region. Performance relative to the EU in 2014 has increase for all regions, and most strongly for *Emilia-Romagna* (ITH5).

LITHUANIA



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

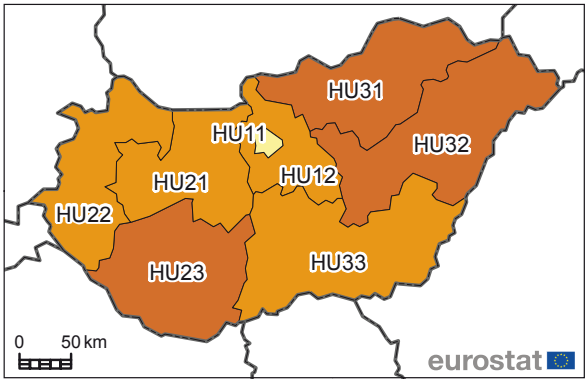
NUTS	Region	RII	Rank	Group	Change
LT01	**Sostinės regionas**	102.7	96	Strong -	47.8
LT02	Vidurio ir vakarų Lietuvos regionas	67.8	176	Emerging +	31.3

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Lithuania is a Moderate Innovator and includes two regions and performance differences are high.

Sostinės regionas (LT01), the capital region, is the most innovative region and is a Strong Innovator. *Vidurio ir vakarų Lietuvos regionas* (LT02) is an Emerging Innovator. Performance relative to the EU in 2014 has increased for both regions.

HUNGARY



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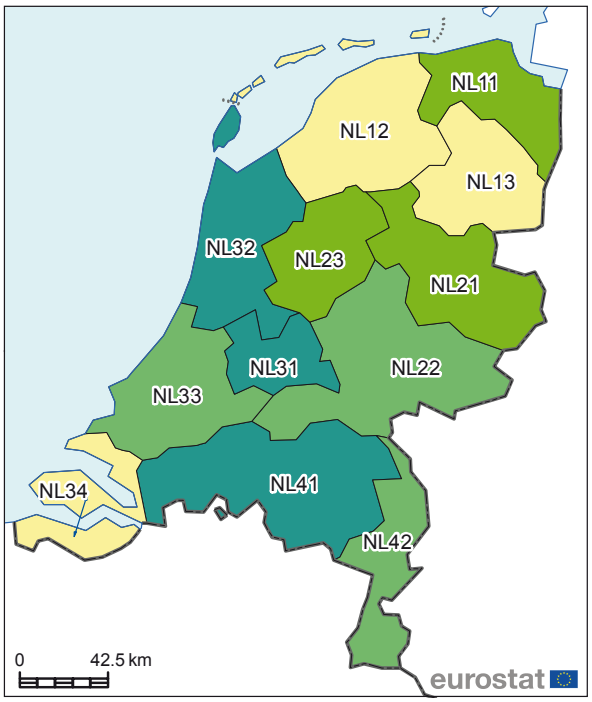
NUTS	Region	RII	Rank	Group	Change
HU11	**Budapest**	97.6	116	Moderate +	20.6
HU12	Pest	66.0	181	Emerging +	14.8
HU21	Közép-Dunántúl	57.7	192	Emerging +	4.9
HU22	Nyugat-Dunántúl	54.8	201	Emerging +	2.4
HU23	Dél-Dunántúl	48.9	215	Emerging	1.1
HU31	Észak-Magyarország	49.1	214	Emerging	2.7
HU32	Észak-Alföld	50.9	209	Emerging	6.8
HU33	Dél-Alföld	57.3	195	Emerging +	3.1

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Hungary is an Emerging Innovator and includes eight regions.

Budapest (HU11) is the most innovative region and the only Moderate Innovator. The other regions are all Emerging Innovators. Performance relative to the EU in 2014 has increased for all regions, and most strongly for *Budapest* (HU11) and *Pest* (HU12).

NETHERLANDS



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

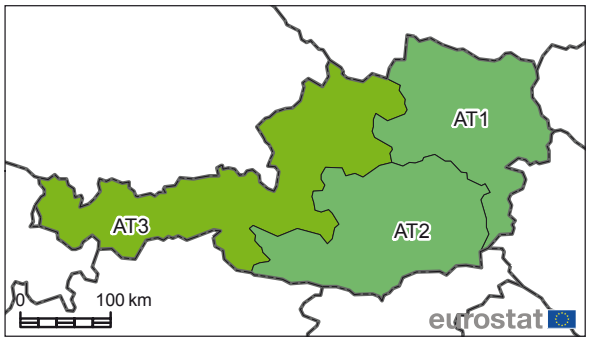
NUTS	Region	RII	Rank	Group	Change
NL11	Groningen	115.7	62	Strong	13.3
NL12	Friesland	97.4	117	Moderate +	10.6
NL13	Drenthe	94.5	122	Moderate +	5.3
NL21	Overijssel	112.3	70	Strong	8.6
NL22	Gelderland	122.2	44	Strong +	12.9
NL23	Flevoland	109.7	75	Strong	7.1
NL31	Utrecht	130.3	29	Leader -	11.2
NL32	**Noord-Holland**	130.3	28	Leader -	15.0
NL33	Zuid-Holland	123.5	42	Strong +	13.8
NL34	Zeeland	94.7	121	Moderate +	10.6
NL41	Noord-Brabant	128.3	36	Leader -	14.8
NL42	Limburg	122.1	45	Strong +	17.7

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

The Netherlands is a Strong Innovator and includes 12 regions.

Utrecht (NL31), *Noord-Holland* (NL32), and *Noord-Brabant* (NL42) are Innovation Leaders. Six regions are Strong Innovators, and three regions are Moderate Innovators. Performance relative to the EU in 2014 has improved for all regions, and most strongly for *Limburg* (NL42).

AUSTRIA



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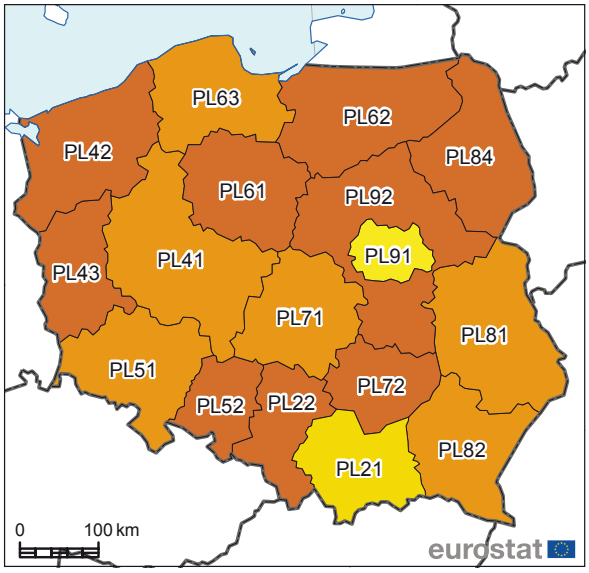
NUTS	Region	RII	Rank	Group	Change
AT1	**Ostösterreich**	121.1	47	Strong +	10.6
AT2	Südösterreich	116.8	57	Strong +	9.9
AT3	Westösterreich	115.1	63	Strong	12.0

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Austria is a Strong Innovator and includes three regions.

All three regions are Strong Innovators, and performance is highest in *Ostösterreich* (AT1). Performance relative to the EU in 2014 has increased for all regions.

POLAND



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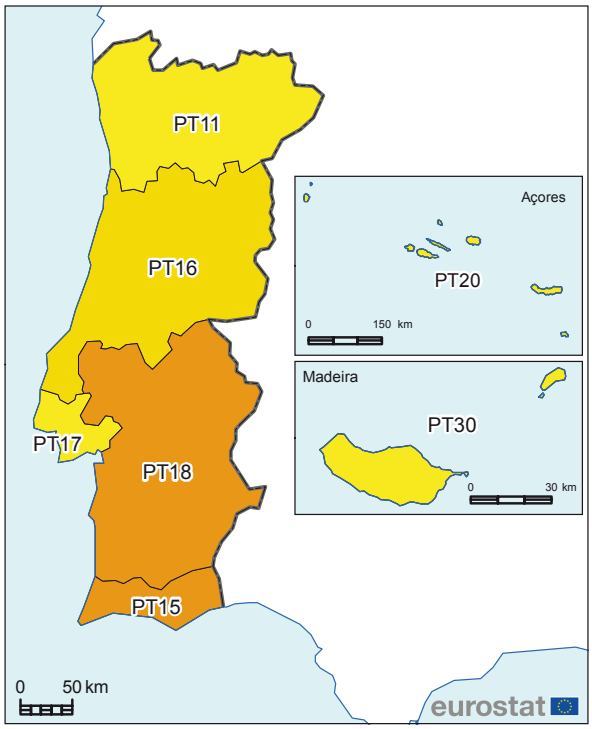
NUTS	Region	RII	Rank	Group	Change
PL21	Malopolskie	71.1	170	Moderate -	25.2
PL22	Slaskie	50.5	210	Emerging	12.0
PL41	Wielkopolskie	52.3	208	Emerging +	16.1
PL42	Zachodniopomorskie	47.3	222	Emerging	11.1
PL43	Lubuskie	47.5	221	Emerging	11.8
PL51	Dolnoslaskie	64.5	182	Emerging +	22.1
PL52	Opolskie	48.4	217	Emerging	15.4
PL61	Kujawsko-Pomorskie	49.3	213	Emerging	16.7
PL62	Warminsko-Mazurskie	42.5	224	Emerging	12.0
PL63	Pomorskie	63.6	184	Emerging +	20.2
PL71	Lódzkie	52.8	207	Emerging +	15.2
PL72	Swietokrzyskie	40.7	225	Emerging	11.0
PL81	Lubelskie	53.0	205	Emerging +	19.3
PL82	Podkarpackie	57.0	196	Emerging +	14.4
PL84	Podlaskie	49.3	212	Emerging	13.4
PL91	**Warszawski stoleczny**	88.1	137	Moderate	29.9
PL92	Mazowiecki regionalny	36.3	227	Emerging	11.8

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Poland is an Emerging Innovator and includes 17 regions.

Warszawski stoleczny (PL91), the capital region, is the most innovative region, and one of two Moderate Innovators. All other regions are Emerging Innovators. Performance relative to the EU in 2014 has increased for all regions, and most strongly in *Warszawski stoleczny* (PL91), *Malopolskie* (PL21) and *Dolnoslaskie* (PL51).

PORTUGAL



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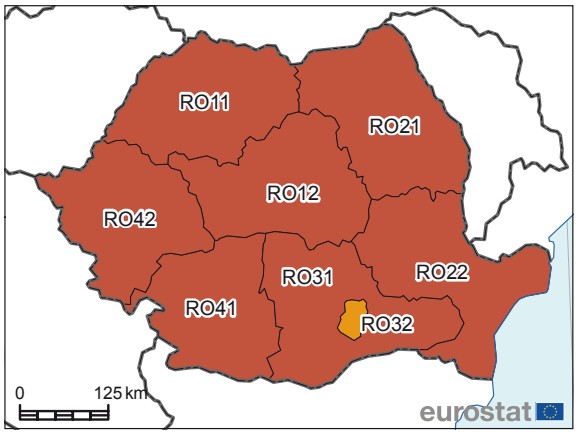
NUTS	Region	RII	Rank	Group	Change
PT11	Norte	80.3	151	Moderate	11.8
PT15	Algarve	57.6	193	Emerging +	4.9
PT16	Centro	78.8	157	Moderate -	8.0
PT17	**Lisboa**	89.7	131	Moderate	6.2
PT18	Alentejo	66.7	180	Emerging +	8.6
PT2	Região Autónoma dos Açores	46.0	223	Emerging	6.5
PT3	Região Autónoma da Madeira	53.6	204	Emerging +	0.4

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Portugal is a Moderate Innovator and includes seven regions.

Three regions are Moderate Innovators, and four regions are Emerging Innovators. *Lisboa* (PT17), the capital region, is the most innovative region. Performance relative to the EU in 2014 has improved for all regions, and most strongly for *Norte* (PT11).

ROMANIA



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

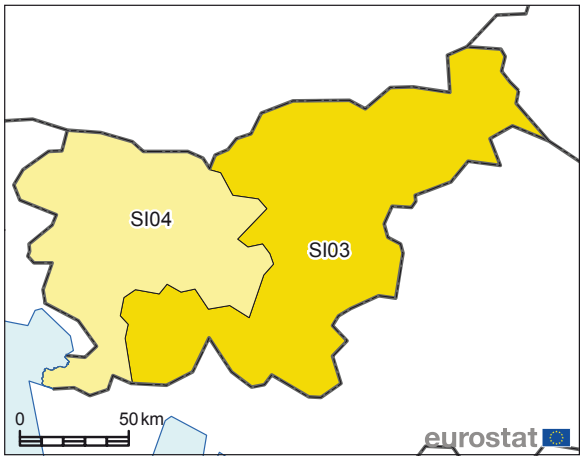
NUTS	Region	RII	Rank	Group	Change
RO11	Nord-Vest	31.4	232	Emerging -	9.2
RO12	Centru	26.5	235	Emerging -	5.4
RO21	Nord-Est	20.9	237	Emerging -	-1.0
RO22	Sud-Est	17.4	239	Emerging -	-2.7
RO31	Sud - Muntenia	18.0	238	Emerging -	1.3
RO32	**Bucuresti - Ilfov**	56.9	197	Emerging +	12.4
RO41	Sud-Vest Oltenia	16.7	240	Emerging -	4.4
RO42	Vest	30.3	233	Emerging -	8.8

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

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 3.4 times as well as the lowest performing region, *Sud-Vest Oltenia* (RO41). Performance relative to the EU in 2014 has improved for six regions and declined for two regions.

SLOVENIA



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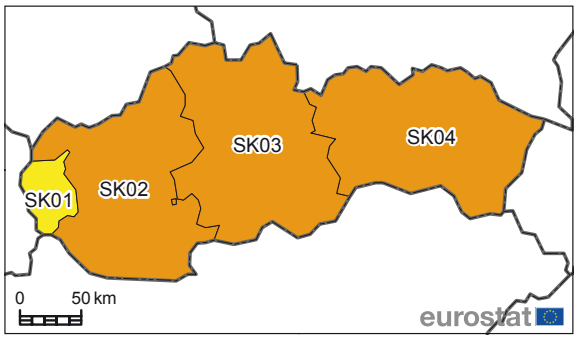
NUTS	Region	RII	Rank	Group	Change
SI03	Vzhodna Slovenija	79.8	153	Moderate -	4.5
SI04	**Zahodna Slovenija**	98.1	113	Moderate +	5.7

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Slovenia is a Moderate Innovator and includes two regions.

Both regions are Moderate Innovators and *Zahodna Slovenija* (SI04) is the most innovative region. Performance relative to the EU in 2014 has increased for both regions.

SLOVAKIA



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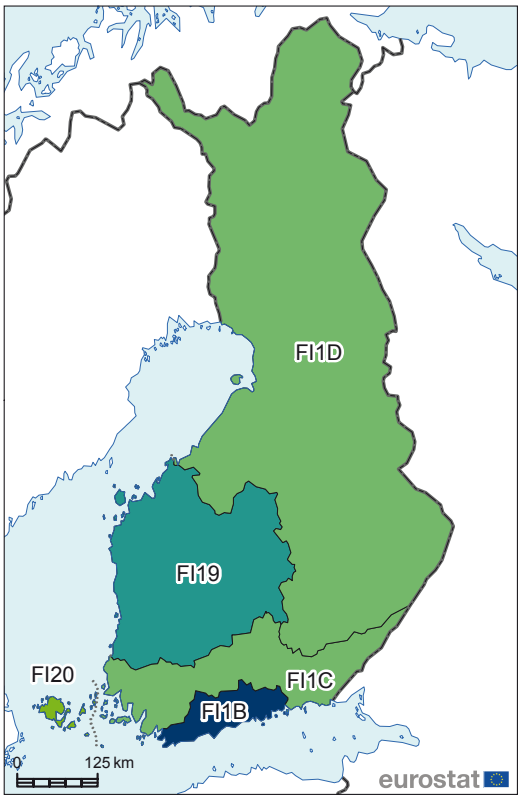
NUTS	Region	RII	Rank	Group	Change
SK01	**Bratislavský kraj**	87.5	138	Moderate	-0.6
SK02	Západné Slovensko	55.5	200	Emerging +	9.5
SK03	Stredné Slovensko	57.5	194	Emerging +	10.0
SK04	Východné Slovensko	54.6	202	Emerging +	4.3

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

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 relative to the EU in 2014 has increased for three regions and marginally decreased for *Bratislavský kraj* (SK01).

FINLAND



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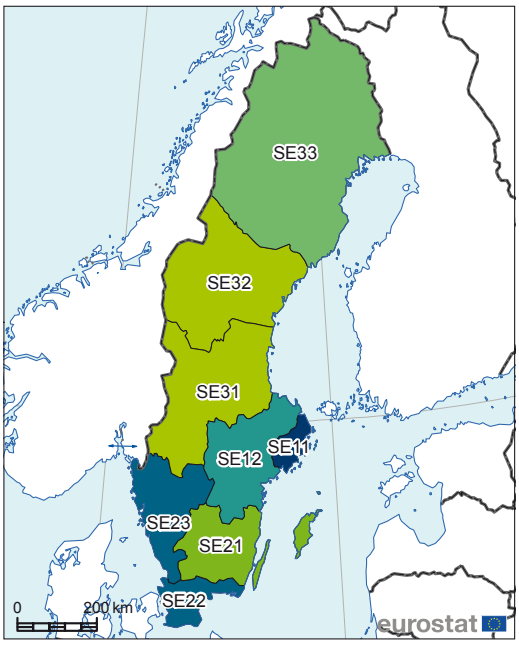
NUTS	Region	RII	Rank	Group	Change
FI1B	**Helsinki-Uusimaa**	151.7	2	Leader +	20.6
FI1C	Helsinki-Uusimaa	117.0	55	Strong +	19.0
FI19	Etelä-Suomi	130.7	25	Leader -	24.7
FI1D	Pohjois- ja Länsi-Suomi	118.6	50	Strong +	18.7
FI2	Åland	109.3	77	Strong	20.9

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Finland is an Innovation Leader and includes five regions.

Two regions are Innovation Leaders, *Helsinki-Uusimaa* (FI1B), the overall third most innovative region in Europe, and *Etelä-Suomi* (FI19). The other three regions are Strong Innovators. Performance relative to the EU in 2014 has increased for all regions, most strongly for *Etelä-Suomi* (FI19).

SWEDEN



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

NUTS	Region	RII	Rank	Group	Change
SE11	**Stockholm**	154.5	1	Leader +	17.4
SE12	Östra Mellansverige	132.8	23	Leader -	12.5
SE21	Småland med öarna	110.5	73	Strong	16.0
SE22	Sydsverige	141.8	9	Leader	13.4
SE23	Västsverige	137.8	11	Leader	13.4
SE31	Norra Mellansverige	100.7	101	Strong -	15.5
SE32	Mellersta Norrland	101.1	99	Strong -	8.9
SE33	Övre Norrland	119.2	49	Strong +	6.5

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Sweden is an Innovation Leader and includes eight regions.

Four regions are Innovation Leaders, and four regions are Strong Innovators. *Stockholm* (SE11), the capital region, is the most innovative region in Europe. Performance relative to the EU in 2014 has increased for all regions, and most strongly for *Stockholm* (SE11).

NORWAY

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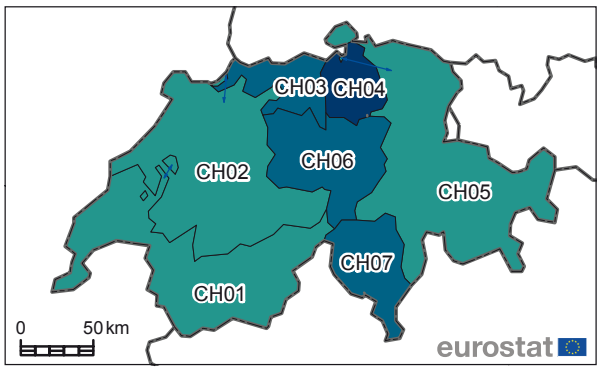
NUTS	Region	RII	Rank	Group	Change
NO01	**Oslo og Akershus**	134.3	17	Leader -	23.7
NO02	Hedmark og Oppland	93.5	125	Moderate +	27.2
NO03	Sør-Østlandet	103.7	92	Strong -	26.3
NO04	Agder og Rogaland	106.7	88	Strong -	26.1
NO05	Vestlandet	116.2	59	Strong	26.9
NO06	Trøndelag	129.7	31	Leader -	20.3
NO07	Nord-Norge	100.6	102	Strong -	15.5

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Norway is a Strong Innovator and includes seven regions.

Oslo og Akershus (NO01), the capital region, and *Trøndelag* (NO06) are both Innovation Leaders. Four regions are Strong Innovators and *Hedmark og Oppland* (NO02) is a Moderate Innovator. Performance relative to the EU in 2014 has increased for all regions, only for *Nord-Norge* (NO07) performance change is below 20 percent.

SWITZERLAND



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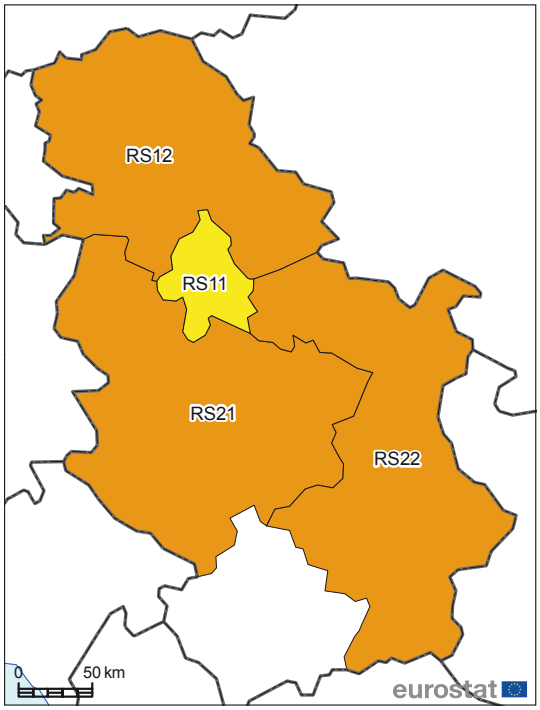
NUTS	Region	RII	Rank	Group	Change
CH01	Région lémanique	133.6	20	Leader -	2.2
CH02	**Espace Mittelland**	129.4	34	Leader -	12.7
CH03	Nordwestschweiz	138.1	10	Leader	0.8
CH04	Zürich	146.4	5	Leader +	-2.5
CH05	Ostschweiz	133.8	18	Leader -	10.8
CH06	Zentralschweiz	136.0	13	Leader	9.5
CH07	Ticino	142.7	8	Leader	20.2

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

Switzerland is an Innovation Leader and includes seven regions.

All regions are Innovation Leaders. *Zürich* (CH04) is the most innovative region and the fifth most innovative region in Europe. Performance relative to the EU in 2014 has increased for six regions, most notably for *Ticino* (CH07), and has decreased for *Zürich* (CH04).



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SERBIA

NUTS §	Region	RII	Rank	Group	Change
RS11	**Belgrade**	80.2	152	Moderate	26.2
RS12	Vojvodina	58.2	191	Emerging +	10.1
RS21	Šumadija and Western Serbia	52.9	206	Emerging +	10.6
RS22	Southern and Eastern Serbia	53.6	203	Emerging +	16.3

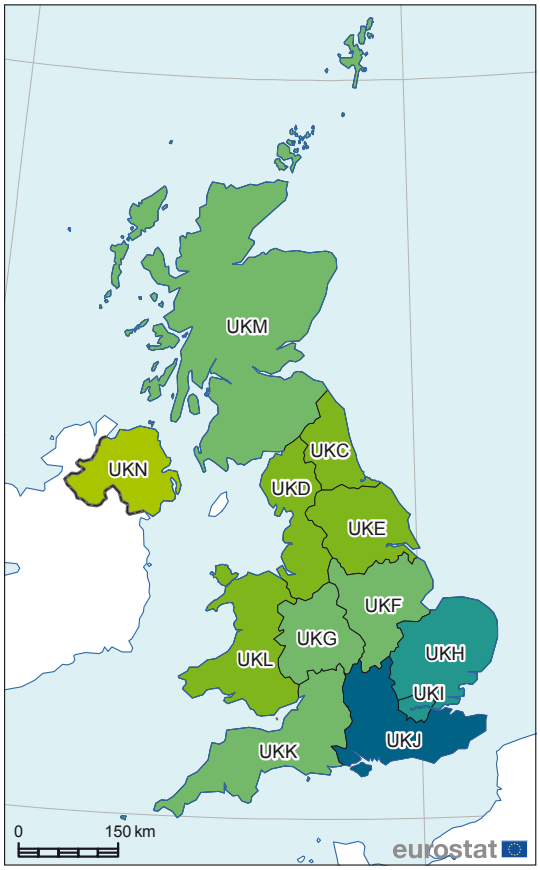
RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

§ For Serbia, official NUTS codes are not available, as Eurostat and Serbia have not yet agreed on statistical regions for the country. This report uses the unofficial codes as shown in the table.

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 relative to the EU in 2014 has increased for all regions, most strongly for *Belgrade* (RS11).

UNITED KINGDOM



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

NUTS	Region	RII	Rank	Group	Change
UKC	North East	112.0	71	Strong	19.9
UKD	North West	114.0	66	Strong	10.8
UKE	Yorkshire and The Humber	113.3	68	Strong	18.2
UKF	East Midlands	117.6	52	Strong +	10.9
UKG	West Midlands	121.1	46	Strong +	20.6
UKH	East of England	130.5	26	Leader -	15.6
UKI	**London**	133.0	22	Leader -	11.0
UKJ	South East	137.6	12	Leader	17.6
UKK	South West	124.7	39	Strong +	13.3
UKL	Wales	114.5	65	Strong	21.2
UKM	Scotland	122.2	43	Strong +	19.2
UKN	Northern Ireland	106.8	87	Strong -	20.4

RII: performance in 2021 relative to that of the EU in 2021. Rank: rank performance in 2021 across all regions. Group: respective sub-group. Change: performance change calculated as the difference between the performance in 2021 and 2014 relative to that of the EU in 2014.

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

Three regions are Innovation Leaders, and *South East* (UKJ) is the most innovative region. The other nine regions are Strong Innovators. Performance relative to the EU in 2014 has increased for all regions, and most strongly for *Wales* (UKL).

3.4 Performance changes over time

Performance of regional innovation systems changes over time. Over the last eight years, performance has increased for 225 regions and declined for only 15 regions, including four regions in France, three each in Denmark and Germany, two in Romania, and one each in Czechia, Slovakia, and Switzerland (**Table 9**). However, EU performance increased with 14.2%-points[7] over these years, and comparing regions' growth performance with the EU better highlights differences in growth performance across European regions. Compared to the EU, only 95 (or 40% of the) regions managed to improve their performance, where for 145 (or 60% of the) regions performance worsened compared to that of the EU (**Table 10**). Relative performance increased for 50% of the Moderate Innovators, 43% of the Strong Innovators, 39% of the Innovation Leaders, and only 25% of the Emerging Innovators.

Over time, there has been a process of convergence in regional performance with decreasing performance differences between regions. The spread in regional innovation performance, as measured by sigma convergence, has decreased over time[8].

Performance relative to the EU has increased for all regions in Belgium, Croatia, Finland, Lithuania, and Norway, and all but one region in Greece and Italy. Performance relative to the EU has decreased for all regions in Austria, Bulgaria, Denmark, France, Ireland, Portugal, Romania, Slovakia, and Slovenia, and all but one region in Hungary and Switzerland.

Relative performance changes over time are visualised in **Figure 3** 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 9: Performance change over time by regional performance group

	All regions	Innovation Leaders	Strong Innovators	Moderate Innovators	Emerging Innovators
Performance increase	225 (94%)	36 (95%)	65 (97%)	61 (90%)	63 (94%)
Performance decrease	15 (7%)	2 (5%)	2 (3%)	7 (10%)	4 (6%)
	240	38	67	68	67

Table 10: Performance change over time relative to EU by regional performance group

	All regions	Innovation Leaders	Strong Innovators	Moderate Innovators	Emerging Innovators
Performance increase	95 (40%)	15 (39%)	29 (43%)	34 (50%)	17 (25%)
Performance decrease	145 (60%)	23 (61%)	38 (57%)	34 (50%)	50 (75%)
	240	38	67	68	67

Performance increases over time are driven more by some indicators than by others. **Table 11** summarizes for each indicator the average increase across all regions compared to their own performance in 2014, 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: R&D expenditures in the business sector (97%), Trademark applications (66%), SMEs with product innovations (63%), and Innovative SMEs collaborating with others (61%).[9] 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, Individuals who have above basic overall digital skills, Public-private co-publications, and Population aged 25-34 having completed tertiary education. Indicators for which performance has increased for a relatively small number of regions include: PCT patent applications, Design applications, and R&D expenditures in the public sector. Although the empirical evidence is mixed, results do suggest that innovation performance has increased most due to increasing performance in those indicators measuring innovation activities in the business sector.

The 10 fastest growing regions are shown in **Table 12** These regions are shown on the map in **Figure 3** by the darkest colour green. *Sostinės regionas* (LT01) in Lithuania is the fastest growing region. In the top 10 there are 4 regions from Greece, 3 from Italy, 2 from Lithuania and 1 from Poland. There are no Innovation Leaders among the top 10 fastest growing regions. Two regions are Strong Innovators, 7 are Moderate Innovators, and one region is an Emerging Innovator.

[7] This growth rate for the EU is different from that in the EIS 2021 report as the data calculations for the RIS 2021 were finalized before the final calculations of the EIS 2021. As several data revisions were performed for the EIS 2021 in May, results for the innovation indexes for the EU and individual countries in both reports are slightly different. There is however no impact on the performance ranking for countries and regional performance group membership in the RIS.

[8] Sigma-convergence occurs when the spread in innovation performance across a group of regions falls over time. This spread in convergence is measured by the ratio of the standard deviation and the average performance of all regions. For the year measured by the RII 2015, the spread was 0.393, for the year measured by the RII 2017, the spread was 0.386, for the year measured by the RII 2019, the spread was 0.370, and for the RII 2021, the spread was 0.350. With the spread falling consistently over time, sigma-convergence has taken place with declining performance differences between regions.

[9] These average percentage shares however do not differentiate between regions starting from low and high scores. 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, as shown in Table 11, would equal 51%, whereas, assuming both regions have the same GDP, the weighted average would be less than 4%.

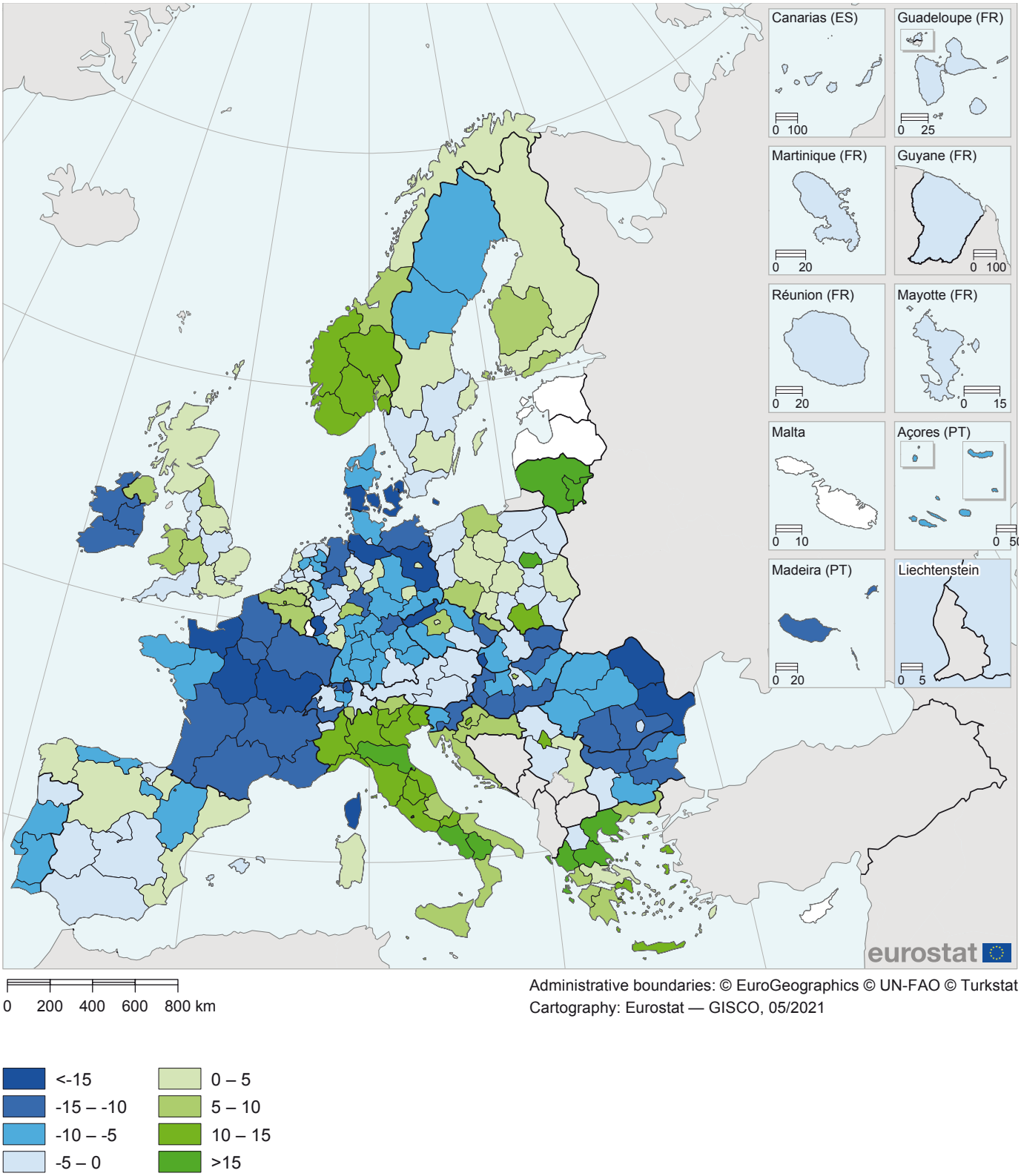
Table 11: Average indicator scores by regional performance group

	Average increase in performance relative to own performance in 2014	Percentage-share of regions for which performance increased	Percentage-share of regions for which performance decreased
Population aged 25-34 having completed tertiary education	26%	82%	15%
Population aged 25-64 participating in lifelong learning	7%	51%	38%
International scientific co-publications	30%	96%	1%
Most-cited scientific publications	55%	50%	50%
Individuals who have above basic overall digital skills	39%	96%	4%
R&D expenditures in the public sector	3%	43%	49%
R&D expenditures in the business sector	97%	76%	20%
Non-R&D innovation expenditures	1%	52%	48%
Innovation expenditures per person employed	14%	77%	20%
Employed ICT specialists	27%	78%	17%
SMEs with product innovations	63%	75%	25%
SMEs with business process innovations	22%	66%	34%
Innovative SMEs collaborating with others	61%	74%	25%
Public-private co-publications	29%	91%	7%
PCT patent applications	15%	36%	58%
Trademark applications	66%	73%	26%
Design applications	25%	42%	56%
Employment in knowledge-intensive activities	46%	74%	22%
Employment in innovative SMEs	16%	64%	36%
Sales of new-to-market and new-to-enterprise innovations	18%	61%	39%
Air emissions in fine particulates (PM2.5) in Industry	33%	60%	40%

Table 12: Top-10 fastest growing regions (2014-2021)

Rank	Region	Change in performance	Change in performance relative to EU	Performance sub-group
1	Sostinės regionas (LT01)	47.8	32.9	Strong innovator -
2	Ipeiros (EL54)	36.0	21.2	Moderate innovator -
3	Ionia Nisia (EL62)	35.6	20.8	Emerging innovator +
4	Emilia-Romagna (ITH5)	34.2	19.3	Strong innovator
5	Vidurio ir vakarų Lietuvos regionas (LT02)	31.3	16.5	Emerging innovator +
6	Thessalia (EL61)	30.8	16.0	Moderate innovator -
7	Basilicata (ITF5)	30.1	15.3	Moderate innovator -
8	Campania (ITF3)	30.0	15.2	Moderate innovator
9	Kentriki Makedonia (EL52)	30.0	15.2	Moderate innovator -
10	Warszawski stoleczny (PL91)	29.9	15.1	Moderate innovator

Figure 3: Innovation performance change 2014-2021



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Cartography: Eurostat — GISCO, 05/2021

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

4. Performance maps per indicator[10]

The distribution of relative performance scores varies more strongly across the individual indicators resulting from more skewed distributions for the indicators compared to that for the regional innovation index. Most indicator scores are not symmetrically distributed with equal shares of regions having high and low scores. For instance, there are high shares of regions performing above 125% of the EU average on SMEs with business process innovations, Public-private co-publications, Employment in innovative SMEs, and Air emissions in fine particulates (**Table 13**). By contrast, more than 100 regions perform below 70% of the EU average on R&D expenditure in the public sector, R&D expenditure in the business sector, Employed ICT specialists, PCT patent applications, Trademark applications, and Design applications.

On the following pages, for each of the indicators used in the RIS 2021, 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 20 regions classified as Top high performers, the next best 20 regions as Middle high performers, and so on until the last 20 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.

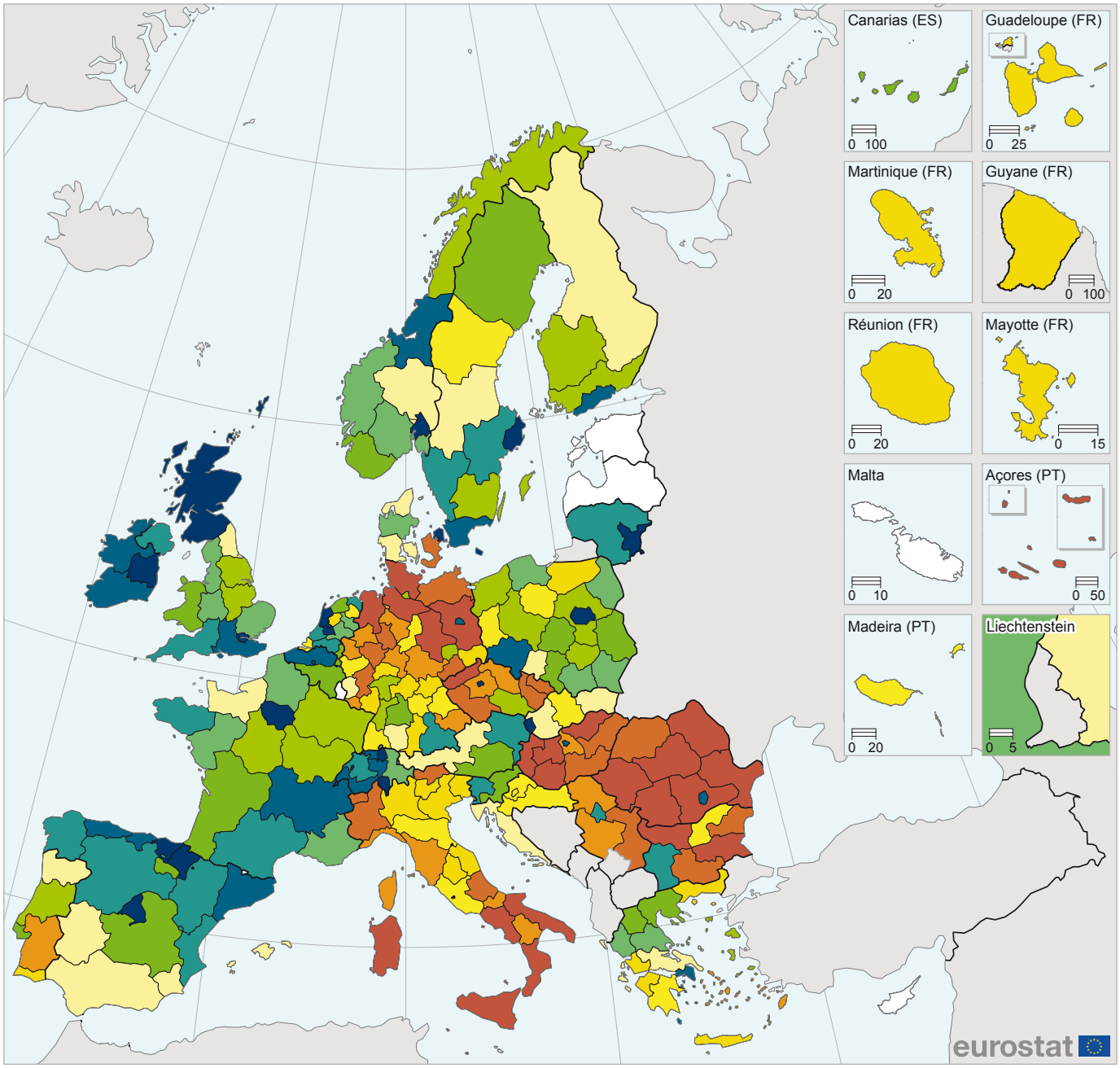
Table 13: Number of regions in different performance groups per indicator

	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	38	67	68	67
Population aged 25-34 having completed tertiary education [1]	58	42	64	75
Population aged 25-64 participating in lifelong learning	67	21	65	87
International scientific co-publications	71	49	58	62
Top 10% most-cited publications	54	61	56	69
*Individuals who have above basic overall digital skills [1]	58	42	64	75
R&D expenditure in the public sector	52	18	54	114
R&D expenditure in the business sector	36	20	39	145
Non-R&D innovation expenditure [3]	54	46	80	53
Innovation expenditures per person employed [4]	39	66	73	50
*Employed ICT specialists	46	23	59	112
SMEs with product innovations	69	53	53	65
SMEs with business process innovations	79	39	43	79
Innovative SMEs collaborating with others	70	53	43	74
Public-private co-publications	89	35	54	62
PCT patent applications	41	25	52	122
Trademark applications	40	32	50	118
Design applications	30	33	64	113
*Employment in knowledge-intensive activities	51	46	67	76
Employment in innovative SMEs [4]	87	33	38	70
Sales of new-to-market and new-to-enterprise innovations [3]	41	46	96	50
*Air emissions in fine particulates (PM2.5) in Industry [2]	83	73	22	58

[1] Data missing for one region; [2] Data missing for four regions; [3] Data missing for seven regions; [4] Data missing for 12 regions.

[10] 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 2021. For these countries no performance category is used in the maps.

Percentage population aged 25-34 having completed tertiary education



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Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 05/2021

- Bottom low performers
- Middle low performers
- Top low performers
- Bottom moderate performers
- Middle moderate performers
- Top moderate performers
- Data not available
- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016 *No data for Åland (F12)*
Source: European Commission – Regional Innovation Scoreboard 2021

Percentage population aged 25-34 having completed tertiary education

Performance on Tertiary education is not equally distributed within each country. On average, the best performing region performs 1.9 times higher than the worst performing region. In several countries this ratio is much higher, in particular in Czechia and Romania where it is above 3.

In Belgium, Ireland, Lithuania, Slovenia, and Switzerland, all regions perform above the EU average. In Croatia and Italy, all regions perform below the EU average.

The map shows that most of the best performing regions are in the North and West of Europe, and also in Poland and Spain. Performance is relatively weak in Bulgaria, Croatia, Czechia, Hungary, Italy, Portugal, Romania, and Slovakia.

The top 40 best performing regions are shown on the right. Most regions sharing first place comprise of capital city regions, including *London* (UKI), *Sostines regionas* (LT01), *Warszawski stoleczny* (PL91), *Île de France* (FR1), *Oslo og Akershus* (NO01), *Hovedstaden* (DK01), *Bratislavský kraj* (SK01), *Noord-Holland* (NL32), *Eastern and Midland* (IE06), and *Stockholm* (SE11).

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.3	3	0	NL	2.0	9	3
BG	2.5	1	5	AT	1.2	2	1
CZ	3.0	1	7	PL	2.2	10	7
DK	2.2	2	3	PT	2.5	1	6
DE	2.4	4	34	RO	3.1	1	7
IE	1.2	3	0	SI	1.2	2	0
EL	1.7	5	8	SK	1.7	1	3
ES	2.1	13	6	FI	1.4	2	3
FR	2.2	9	5	SE	1.7	6	2
HR	1.1	0	4	NO	1.6	5	2
IT	1.7	0	21	CH	1.4	7	0
LT	1.4	2	0	RS	1.8	1	3
HU	2.3	1	7	UK	1.9	10	2

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

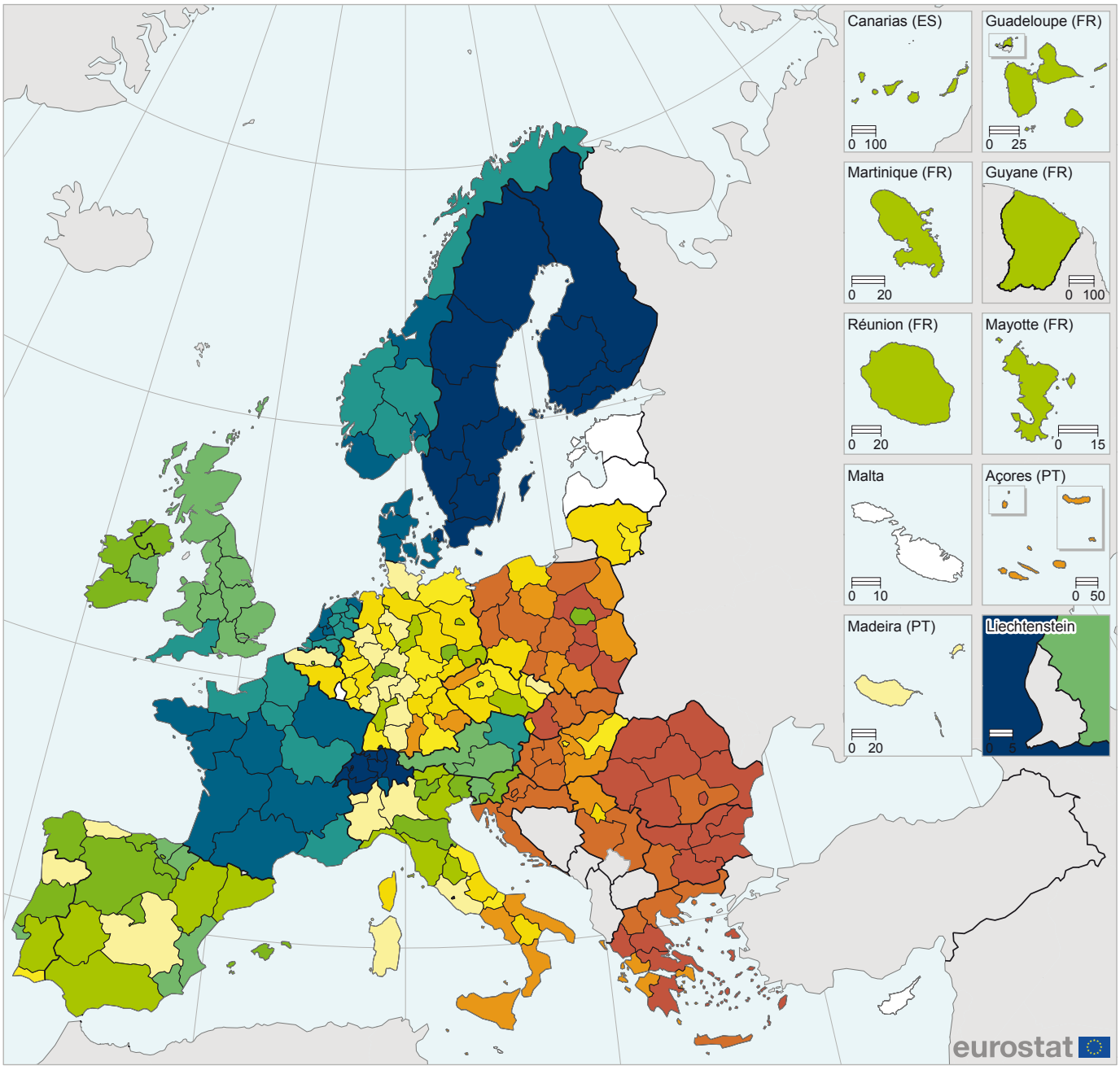
Rationale: This is a general indicator of the supply of advanced skills. It is not limited to science and technical fields, because the adoption of innovations in many areas, including the service sectors, depends on a wide range of skills

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 data values in the last column before normalising the data.*

	Region	Relative to EU score	Indicator value
1	London (UKI)	174.3	67.9
2	Sostines regionas (LT01)	174.3	67.0
3	Warszawski stoleczny (PL91)	174.3	66.7
4	Zürich (CH04)	174.3	64.3
5	Île de France (FR1)	174.3	63.8
6	Utrecht (NL31)	174.3	63.2
7	País Vasco (ES21)	174.3	60.8
8	Oslo og Akershus (NO01)	174.3	60.3
9	Hovedstaden (DK01)	174.3	59.9
10	Bratislavský kraj (SK01)	174.3	59.8
11	Noord-Holland (NL32)	174.3	59.0
12	Eastern and Midland (IE06)	174.3	58.8
13	Stockholm (SE11)	174.3	58.0
14	Praha (CZ01)	174.1	57.3
15	Scotland (UKM)	174.1	57.3
16	Comunidad Foral de Navarra (ES22)	167.8	55.8
17	Ticino (CH07)	165.8	55.3
18	Comunidad de Madrid (ES3)	162.1	54.4
19	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	159.6	53.8
20	Région lémanique (CH01)	159.2	53.7
21	Bucuresti - Ilfov (RO32)	155.0	52.7
22	Northern and Western (IE04)	154.2	52.5
23	Budapest (HU11)	152.1	52.0
24	Principado de Asturias (ES12)	151.7	51.9
25	Cantabria (ES13)	151.3	51.8
26	Zentralschweiz (CH06)	151.3	51.8
27	Cataluña (ES51)	150.5	51.6
28	Auvergne - Rhône-Alpes (FRK)	148.4	51.1
29	Southern (IE05)	147.6	50.9
30	Nordwestschweiz (CH03)	146.7	50.7
31	Trøndelag (NO06)	146.7	50.7
32	Dolnoslaskie (PL51)	146.3	50.6
33	Attiki (EL3)	144.3	50.1
34	South East (UKJ)	142.6	49.7
35	Sydsverige (SE22)	142.2	49.6
36	Helsinki-Uusimaa (FI1B)	141.0	49.3
37	Vlaams Gewest (BE2)	141.0	49.3
38	Berlin (DE3)	140.1	49.1
39	Vidurio ir vakaru Lietuvos regionas (LT02)	139.7	49.0
40	Galicia (ES11)	138.5	48.7
41	Noord-Brabant (NL41)	138.5	48.7

Percentage population aged 25-64 participating in lifelong learning



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Cartography: Eurostat — GISCO, 05/2021

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- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Percentage population aged 25-64 participating in lifelong learning

Performance on Lifelong learning is not equally distributed within each country. On average, the best performing region performs 2.2 times higher than the worst performing region. In several countries this ratio is much higher, in particular in Greece and Romania.

The map shows that in particular regions in Northern Europe – Denmark, Finland, Norway, and Sweden - are in the group of high performers. In Central and Western Europe, regions in the Netherlands, France, Switzerland and Austria also score quite high. Participation in lifelong learning is more dispersed in other countries. E.g., in Poland, *Warszawski stoleczny* (PL81) is a middle strong performer and *Swietokrzyskie* (PL71), *Podkarpackie* (PL72) and *Mazowiecki regionalny* (PL91) are all bottom low performers. In Portugal, *Lisboa* (PT17) is a top strong performer and *Região Autónoma dos Açores* (PT2) is a top low performer. Performance in Eastern Europe and the South of Italy is relatively weak.

The top 40 best performing regions are shown on the right. Swiss, Swedish and Finnish regions dominate the top 20. All regions score equal to or above 244.4% of the EU average. A large performance gap is observed between the top 2 regions, *Zürich* (CH04) and *Sydsverige* (SE22), and the middle and bottom top 5 regions – *Nouvelle-Aquitaine* (FRI), and *Centre - Val de Loire* (FRB).

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.6	0	3	NL	1.4	12	0
BG	3.1	0	6	AT	1.2	3	0
CZ	2.0	0	8	PL	4.4	0	17
DK	1.2	5	0	PT	2.6	2	5
DE	2.1	1	37	RO	5.0	0	8
IE	1.4	2	1	SI	1.2	1	1
EL	7.7	0	13	SK	2.7	0	4
ES	1.5	9	10	FI	1.2	5	0
FR	3.4	12	2	SE	1.2	8	0
HR	1.2	0	4	NO	1.2	7	0
IT	2.4	2	19	CH	1.5	7	0
LT	1.2	0	2	RS	1.8	0	4
HU	2.2	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

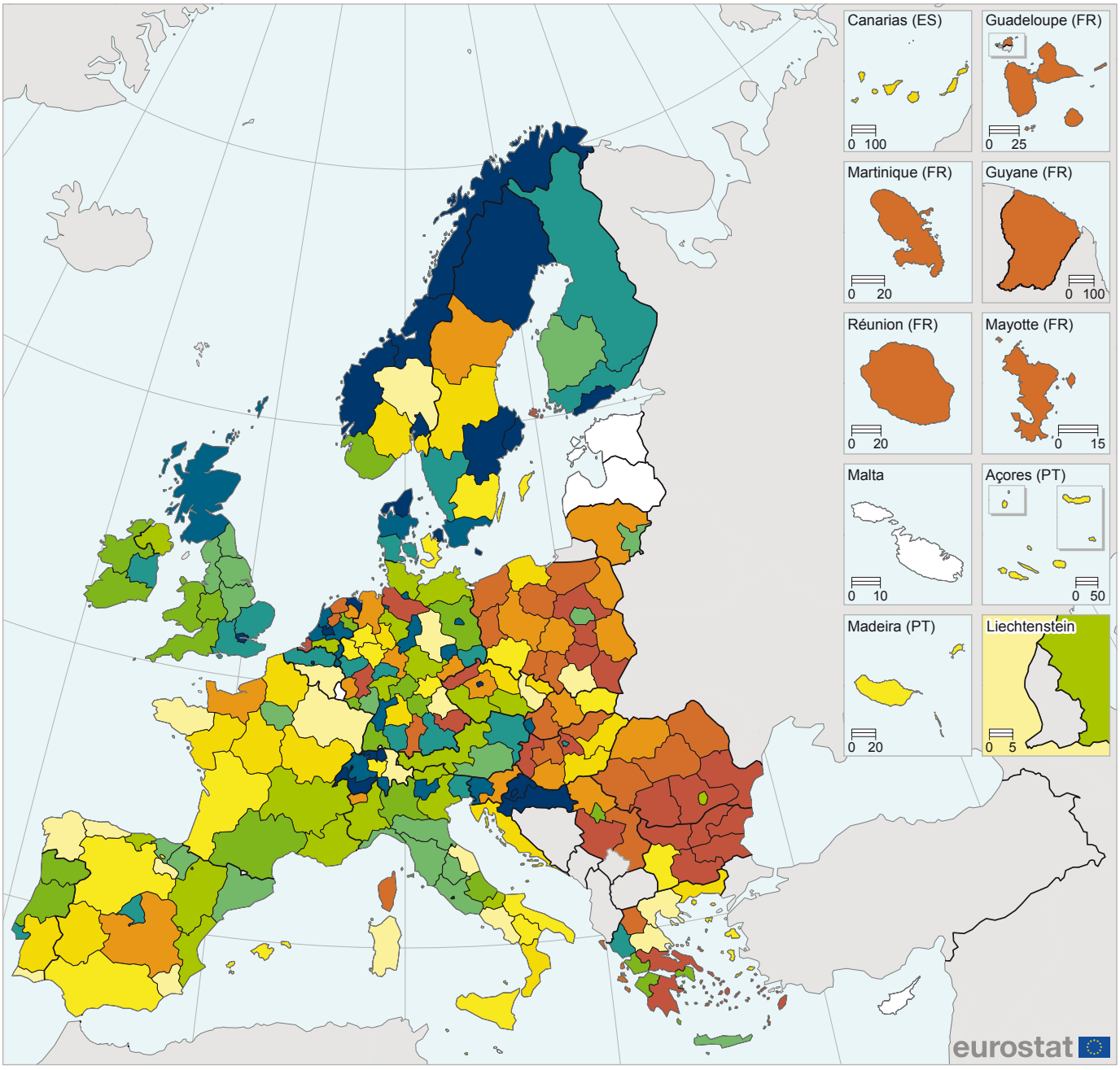
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Zürich (CH04)	248.6	37.8
2	Sydsverige (SE22)	248.6	35.8
3	Stockholm (SE11)	248.6	35.7
4	Västsverige (SE23)	248.6	34.8
5	Östra Mellansverige (SE12)	248.6	34.5
6	Nordwestschweiz (CH03)	248.6	33.9
7	Småland med öarna (SE21)	248.6	33.3
8	Helsinki-Uusimaa (FI1B)	248.6	32.6
9	Zentralschweiz (CH06)	248.6	32.4
10	Ostschweiz (CH05)	248.6	31.7
11	Mellersta Norrland (SE32)	248.6	31.1
12	Espace Mittelland (CH02)	248.6	31.0
13	Övre Norrland (SE33)	248.6	30.9
14	Norra Mellansverige (SE31)	248.6	30.5
15	Région lémanique (CH01)	248.6	28.9
16	Länsi-Suomi (FI19)	248.6	28.5
17	Hovedstaden (DK01)	248.6	27.8
18	Åland (FI2)	248.1	26.8
19	Etelä-Suomi (FI1C)	247.2	26.7
20	Pohjois-ja Itä-Suomi (FI1D)	244.4	26.4
21	Ticino (CH07)	228.7	24.7
22	Sjælland (DK02)	225.0	24.3
23	Syddanmark (DK03)	225.0	24.3
24	Auvergne - Rhône-Alpes (FRK)	224.1	24.2
25	Midtjylland (DK04)	222.2	24.0
26	Nordjylland (DK05)	217.6	23.5
27	Utrecht (NL31)	212.0	22.9
28	Groningen (NL11)	206.5	22.3
29	Pays de la Loire (FRG)	200.9	21.7
30	Bretagne (FRH)	200.0	21.6
31	Occitanie (FRJ)	200.0	21.6
32	Oslo og Akershus (NO01)	197.2	21.3
33	Noord-Holland (NL32)	190.7	20.6
34	Zuid-Holland (NL33)	189.8	20.5
35	Nouvelle-Aquitaine (FRI)	188.0	20.3
36	Centre - Val de Loire (FRB)	185.2	20.0
37	Grand Est (FRF)	185.2	20.0
38	Agder og Rogaland (NO04)	180.6	19.5
39	Trøndelag (NO06)	180.6	19.5
40	Gelderland (NL22)	178.7	19.3

International scientific co-publications per million population



Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

International scientific co-publications per million population

Regional performance on International scientific co-publications shows a significant degree of variation within countries with very high ratios between best and worst performing region for several countries.

Finland and Spain show high degrees of variety, which can be explained by very low performance for some of the very small regions in both countries, including *Ciudad de Melilla* (ES64) and *Åland* (FI2). There are also strong differences in performance groups within several countries. E.g, in Czechia, *Praha* (CZ01) is a top high performer whereas *Severozápad* (CZ04) is a bottom low performer. In Germany, six regions are middle high performers and three regions are bottom low performers. In the Netherlands, *Groningen* (NL11) is a top high performer and *Zeeland* (NL34) is a bottom low performer.

The top 40 best performing regions are shown on the right. Mainly metropolitan areas make up the top 40, although the best three performing regions are non-capital city regions – *Groningen* (NL11), *Trøndelag* (NO06), and *Zürich* (CH04). Strong regional performance is linked to the presence of universities which are more frequent and of larger size in metropolitan areas.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	4.1	3	0	NL	49.8	8	4
BG	22.9	0	6	AT	1.9	3	0
CZ	37.3	3	5	PL	38.0	1	16
DK	6.7	4	1	PT	3.9	3	4
DE	18.9	22	16	RO	42.1	1	7
IE	1.8	3	0	SI	5.5	1	1
EL	30.8	5	8	SK	7.1	1	3
ES	193.6	8	11	FI	139.6	4	1
FR	9.3	4	10	SE	8.2	5	3
HR	5.6	3	1	NO	10.2	5	2
IT	6.6	13	8	CH	8.1	5	2
LT	3.5	1	1	RS	10.0	1	3
HU	14.4	1	7	UK	2.6	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

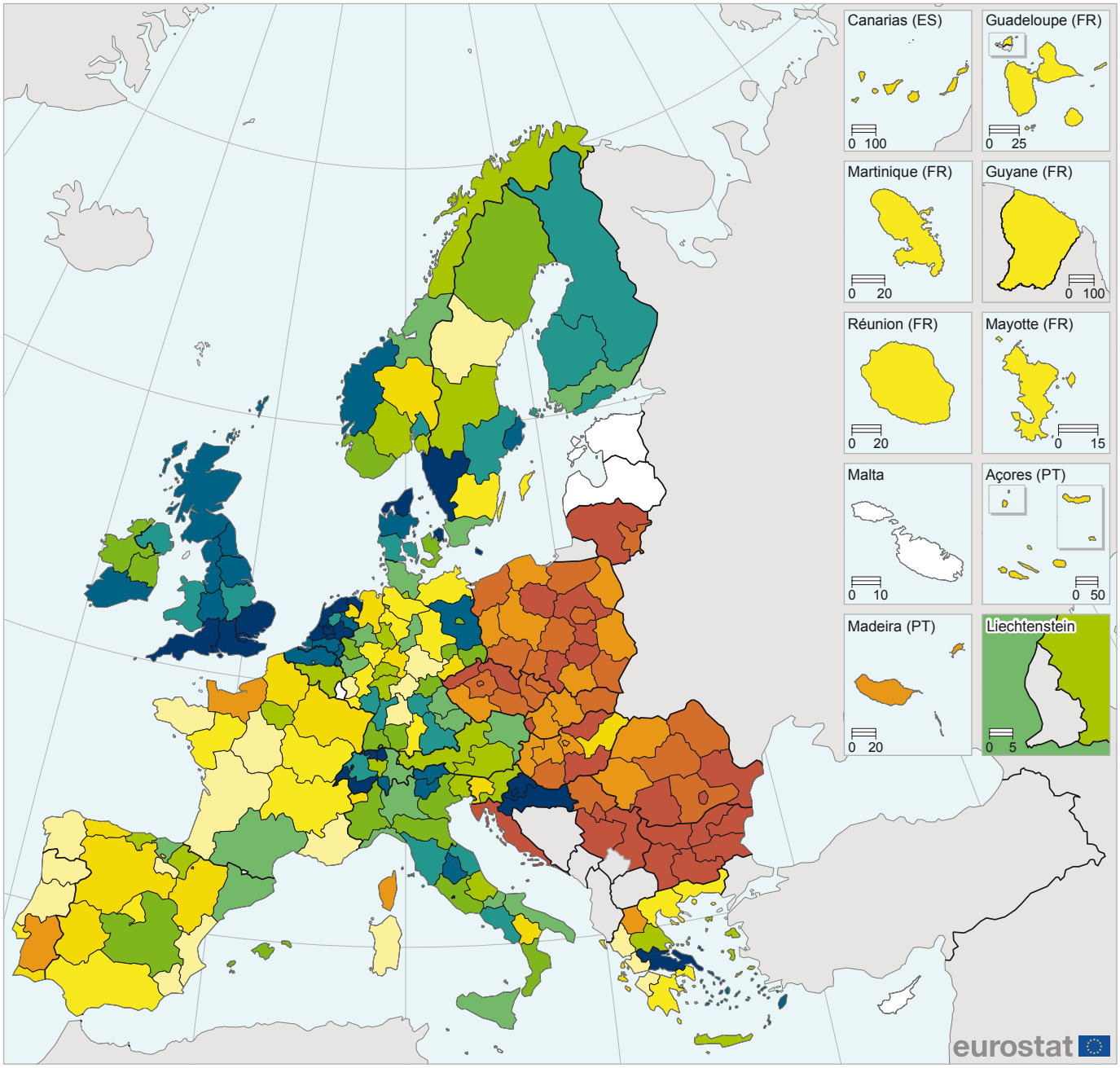
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Groningen (NL11)	178.1	8047.9
2	Trøndelag (NO06)	178.1	7961.1
3	Zürich (CH04)	178.1	7786.1
4	Région lémanique (CH01)	178.1	7438.0
5	Hovedstaden (DK01)	178.1	6641.8
6	Oslo og Akershus (NO01)	178.1	5614.0
7	Utrecht (NL31)	178.1	5557.0
8	Praha (CZ01)	178.1	5286.7
9	Nordwestschweiz (CH03)	178.1	5255.5
10	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	178.1	5224.9
11	Stockholm (SE11)	178.1	4975.4
12	Helsinki-Uusimaa (FI1B)	178.1	4670.6
13	Övre Norrland (SE33)	178.1	4620.3
14	Östra Mellansverige (SE12)	178.1	4362.1
15	Grad Zagreb (HR05)	178.1	4355.6
16	Panonska Hrvatska (HR02)	178.1	4355.6
17	Sjeverna Hrvatska (HR06)	178.1	4355.6
18	Nordjylland (DK05)	178.1	3925.8
19	Nord-Norge (NO07)	178.1	3861.3
20	London (UKI)	178.1	3847.8
21	Vestlandet (NO05)	178.1	3813.0
22	Midtjylland (DK04)	174.7	3665.7
23	Noord-Holland (NL32)	174.3	3647.8
24	Provincia Autonoma Trento (ITH2)	171.7	3538.5
25	Gelderland (NL22)	169.5	3450.7
26	Sydsverige (SE22)	168.5	3409.6
27	Zuid-Holland (NL33)	167.4	3364.8
28	Karlsruhe (DE12)	166.8	3341.7
29	Limburg (NL42)	166.4	3325.3
30	Ticino (CH07)	165.4	3286.0
31	Zahodna Slovenija (SI04)	164.4	3244.5
32	Espace Mittelland (CH02)	163.0	3192.0
33	Bratislavský kraj (SK01)	162.2	3157.1
34	Berlin (DE3)	162.0	3149.2
35	Bremen (DE5)	160.8	3103.3
36	Leipzig (DED5)	157.1	2963.7
37	Braunschweig (DE91)	156.7	2948.7
38	Scotland (UKM)	156.0	2920.3
39	Hamburg (DE6)	155.6	2907.6
40	Ostösterreich (AT1)	155.2	2890.8

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



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Cartography: Eurostat — GISCO, 05/2021

- Bottom low performers
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- Top low performers
- Bottom moderate performers
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- Data not available
- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

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

Performance is not equally distributed within each country. On average, the best performing region performs 2.2 times higher than the worst performing region. In several countries this ratio is much higher, in particular in Bulgaria.

Regional performance is closely linked to national performance in several countries. In the United Kingdom, all regions are high performers, and in Croatia, Denmark, Finland and the Netherlands only one region is not a high performer. In Austria all regions are strong performers. In Czechia, Poland, Romania, Serbia and Slovakia, all regions are low performers. In France, Germany and Spain, most regions are either strong or moderate performers. In several countries there is a high variety in the number of performance groups. In both Germany and Sweden, regions belong to any of eight different performance groups, and in Greece, Italy and Spain, regions belong to any of seven different performance groups.

The top 40 best performing regions are shown on the right. The top 10 countries include regions from Croatia, the Netherlands, Switzerland, and United Kingdom. The best performing regions are *Zürich* (CH04), *East of England* (UKH), *Grad Zagreb* (HR05), *Panonska Hrvatska* (HR02), and *Sjeverna Hrvatska* (HR06), scoring equal to or above 173.6% of the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.3	3	0	NL	2.3	11	1
BG	9.9	0	6	AT	1.2	2	1
CZ	2.4	0	8	PL	2.8	0	17
DK	1.4	5	0	PT	1.6	0	7
DE	1.8	23	15	RO	3.7	0	8
IE	1.2	3	0	SI	1.3	1	1
EL	2.8	5	8	SK	1.4	0	4
ES	--	5	14	FI	1.1	5	0
FR	1.7	1	13	SE	1.6	6	2
HR	3.7	3	1	NO	1.9	6	1
IT	1.7	17	4	CH	1.7	7	0
LT	1.0	0	2	RS	1.2	0	4
HU	1.7	0	8	UK	1.4	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

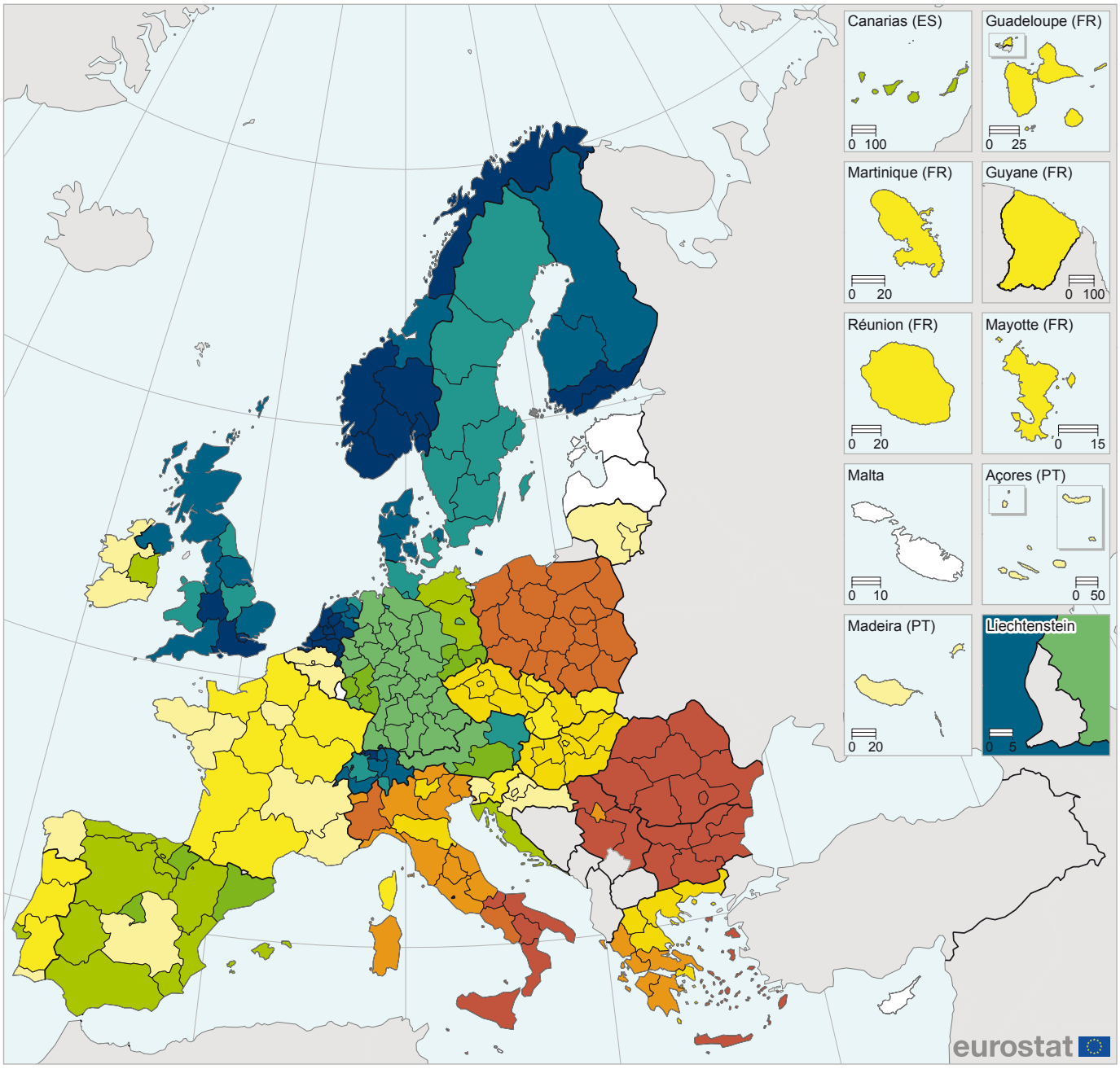
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Zürich (CH04)	178.1	16.7
2	East of England (UKH)	176.8	16.6
3	Grad Zagreb (HR05)	173.6	16.3
4	Panonska Hrvatska (HR02)	173.6	16.3
5	Sjeverna Hrvatska (HR06)	173.6	16.3
6	Utrecht (NL31)	171.9	16.1
7	Sterea Ellada (EL64)	170.2	16.0
8	London (UKI)	168.7	15.8
9	Noord-Holland (NL32)	167.6	15.8
10	Gelderland (NL22)	163.5	15.4
11	Zuid-Holland (NL33)	161.1	15.2
12	Friesland (NL12)	158.5	15.0
13	Hovedstaden (DK01)	154.7	14.6
14	South East (UKJ)	154.2	14.6
15	South West (UKK)	154.1	14.6
16	Région lémanique (CH01)	152.6	14.5
17	Västsverige (SE23)	152.2	14.4
18	Nordjylland (DK05)	151.9	14.4
19	Groningen (NL11)	151.9	14.4
20	Nordwestschweiz (CH03)	151.5	14.4
21	Limburg (NL42)	147.7	14.0
22	Stockholm (SE11)	146.3	13.9
23	Yorkshire and The Humber (UKE)	146.2	13.9
24	Scotland (UKM)	145.6	13.8
25	Zeeland (NL34)	144.9	13.8
26	North West (UKD)	143.6	13.7
27	Vestlandet (NO05)	143.3	13.6
28	Midtjylland (DK04)	143.2	13.6
29	Overijssel (NL21)	142.1	13.5
30	North East (UKC)	141.4	13.5
31	Vlaams Gewest (BE2)	139.7	13.3
32	Provincia Autonoma Bolzano/Bozen (ITH1)	138.7	13.2
33	Brandenburg (DE4)	138.5	13.2
34	Noord-Brabant (NL41)	138.5	13.2
35	Umbria (ITI2)	138.3	13.2
36	Ticino (CH07)	137.8	13.2
37	Notio Aigaio (EL42)	137.2	13.1
38	West Midlands (UKG)	136.9	13.1
39	Provincia Autonoma Trento (ITH2)	135.3	12.9
40	Southern (IE05)	135.1	12.9

Individuals who have above basic overall digital skills



Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Individuals who have above basic overall digital skills

This is a new indicator in the RIS measuring digital competences and skills of individuals. Regions belonging to the top high performing group are located in just a few countries. There is a strong country effect with regions belonging to similar performance groups. All regions in Denmark, Finland, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom, are high performers. Most regions in Austria, Germany and Spain, are strong performers. All regions in Belgium, Czechia, France, Hungary, Lithuania, Slovakia and Slovenia, are moderate performers. All regions in Bulgaria, Poland, Romania and Serbia, and almost all regions in Italy, are low performers. Overall, the average ratio across all countries between best and worst performing region is 1.9, with 100 regions performing above the EU average and 139 regions below the EU average.

The top 40 best performing regions are shown on the right. Regions in Denmark, Finland, the Netherlands, and Norway make up the majority of the top 40 best performing regions. The top-4 regions are all from Norway.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.3	3	0	NL	2.0	9	3
BG	2.5	1	5	AT	1.2	2	1
CZ	3.0	1	7	PL	2.2	10	7
DK	2.2	2	3	PT	2.5	1	6
DE	2.4	4	34	RO	3.1	1	7
IE	1.2	3	0	SI	1.2	2	0
EL	1.7	5	8	SK	1.7	1	3
ES	2.1	13	6	FI	1.4	1	3
FR	2.2	9	5	SE	1.7	6	2
HR	1.1	0	4	NO	1.6	5	2
IT	1.7	0	21	CH	1.4	7	0
LT	1.4	2	0	RS	1.8	1	3
HU	2.3	1	7	UK	1.9	10	2

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

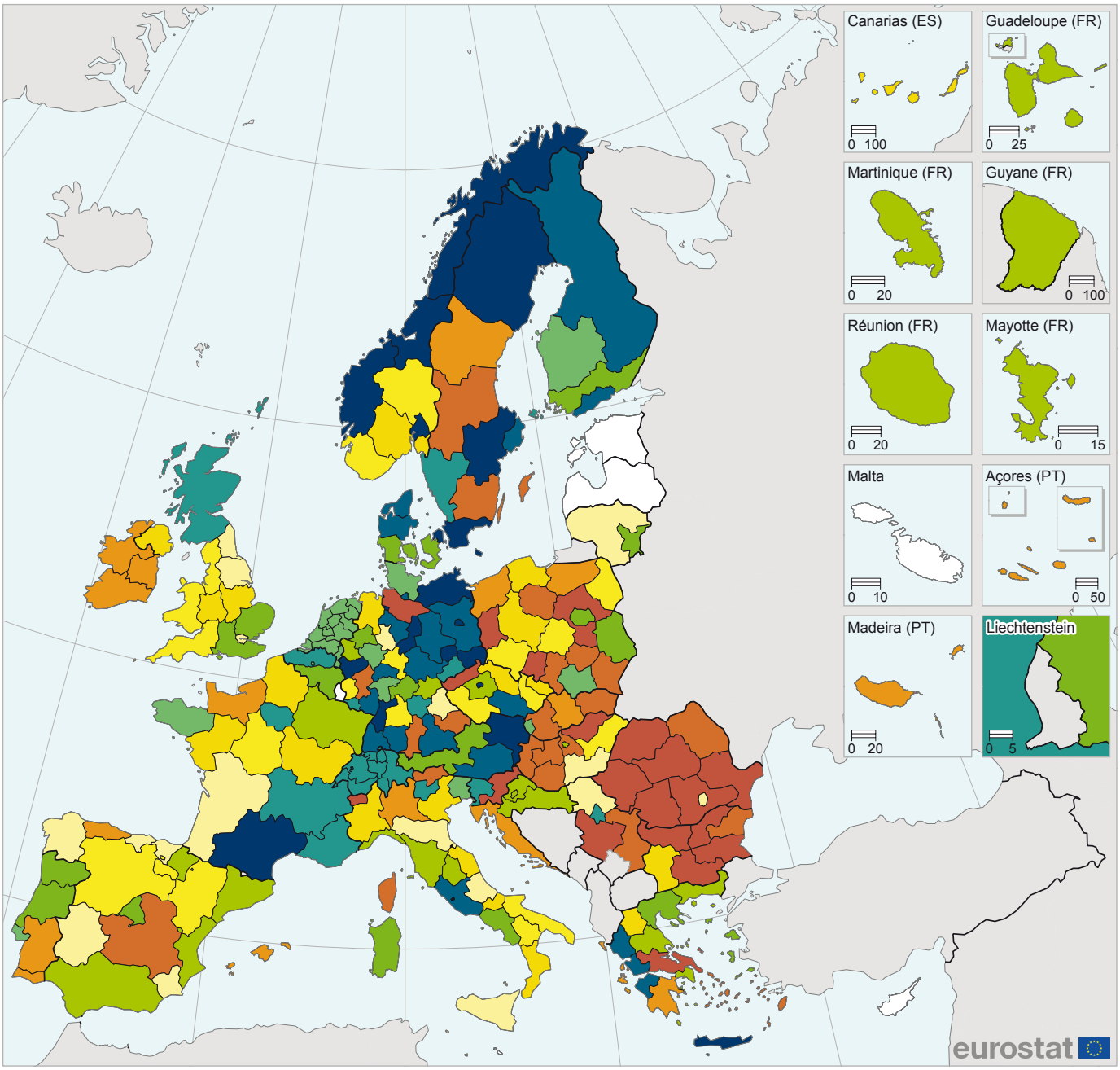
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Innlandet (NO02)	190.0	52.6
2	Sør-Østlandet (NO03)	190.0	52.1
3	Agder og Rogaland (NO04)	188.2	51.5
4	Oslo og Akershus (NO01)	188.2	51.5
5	Helsinki-Uusimaa (FI1B)	186.3	51.1
6	Nord-Norge (NO07)	185.9	51.0
7	Vestlandet (NO05)	185.9	51.0
8	Etelä-Suomi (FI1C)	184.0	50.5
9	South East (UKJ)	183.9	50.5
10	Flevoland (NL23)	183.8	50.5
11	Limburg (NL42)	183.8	50.5
12	Zeeland (NL34)	183.8	50.5
13	Nordwestschweiz (CH03)	181.8	50.0
14	London (UKI)	181.7	50.0
15	West Midlands (UKG)	181.7	50.0
16	Åland (FI2)	181.6	50.0
17	Gelderland (NL22)	181.6	50.0
18	Noord-Brabant (NL41)	181.6	50.0
19	Noord-Holland (NL32)	181.6	50.0
20	Utrecht (NL31)	181.6	50.0
21	Zuid-Holland (NL33)	181.6	50.0
22	Ostschweiz (CH05)	179.6	49.5
23	Région lémanique (CH01)	179.6	49.5
24	Zentralschweiz (CH06)	179.6	49.5
25	Zürich (CH04)	179.6	49.5
26	East of England (UKH)	179.5	49.5
27	Friesland (NL12)	179.5	49.5
28	Länsi-Suomi (FI19)	179.3	49.5
29	Hovedstaden (DK01)	177.3	49.0
30	Midtjylland (DK04)	177.3	49.0
31	South West (UKK)	177.3	49.0
32	Drenthe (NL13)	177.3	49.0
33	Overijssel (NL21)	177.3	49.0
34	Pohjois-ja Itä-Suomi (FI1D)	177.0	48.9
35	North West (UKD)	175.2	48.5
36	Yorkshire and The Humber (UKE)	175.2	48.5
37	Nordjylland (DK05)	175.1	48.5
38	Syddanmark (DK03)	175.1	48.5
39	Trøndelag (NO06)	174.6	48.4
40	Northern Ireland (UKN)	173.0	48.0
41	Scotland (UKM)	173.0	48.0

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



Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

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

Performance is not equally distributed within each country. On average, the best performing region performs almost 7 times higher than the worst performing region. In several countries this ratio is very high, in particular in Bulgaria, Czechia, Germany, Romania, and Spain.

Most regions in Austria, Denmark, Finland, Germany, Norway, Sweden and Switzerland are high performers. Positive outliers are seen in several Eastern European regions, including *Praha* (CZ01) and *Jihovýchod* (CZ06) in Czechia. In Southern Europe two regions in Italy (*Provincia Autonoma Trento* (ITH2) and *Lazio* (IT4)) and three regions in Greece (*Kriti* (EL43), *Ipeiros* (EL54) and *Dytiki Ellada* (EL63)) are high performers. High shares of strong performers are observed in Belgium, Croatia, and the Netherlands. High shares of moderate performers are observed in Czechia, Italy, Spain, and the United Kingdom. High shares of low performers are observed in Bulgaria, Hungary, Ireland, Poland, Portugal, Romania, Serbia, and Slovakia.

The top 40 best performing regions are shown on the right. There is a strong domination of German regions, with *Dresden* (DED2), *Berlin* (DE3), *Braunschweig* (DE91), and *Bremen* (DE5), being in the top 5. Besides three more German regions, two Norwegian regions - *Trøndelag* (NO06) and *Oslo og Akershus* (NO01) -, and one Swedish region - *Övre Norrland* (SE33) – make up the top 10.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.4	2	1	NL	1.0	0	12
BG	16.5	0	6	AT	1.8	2	1
CZ	20.1	2	6	PL	9.9	1	16
DK	2.3	3	2	PT	3.0	1	6
DE	14.9	24	14	RO	16.3	0	8
IE	1.0	0	3	SI	7.2	1	1
EL	10.5	3	10	SK	4.9	1	3
ES	17.3	0	19	FI	1.5	4	1
FR	6.6	5	9	SE	7.6	5	3
HR	1.9	0	4	NO	6.1	4	3
IT	10.5	3	18	CH	1.0	7	0
LT	1.4	0	2	RS	7.7	1	3
HU	3.8	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

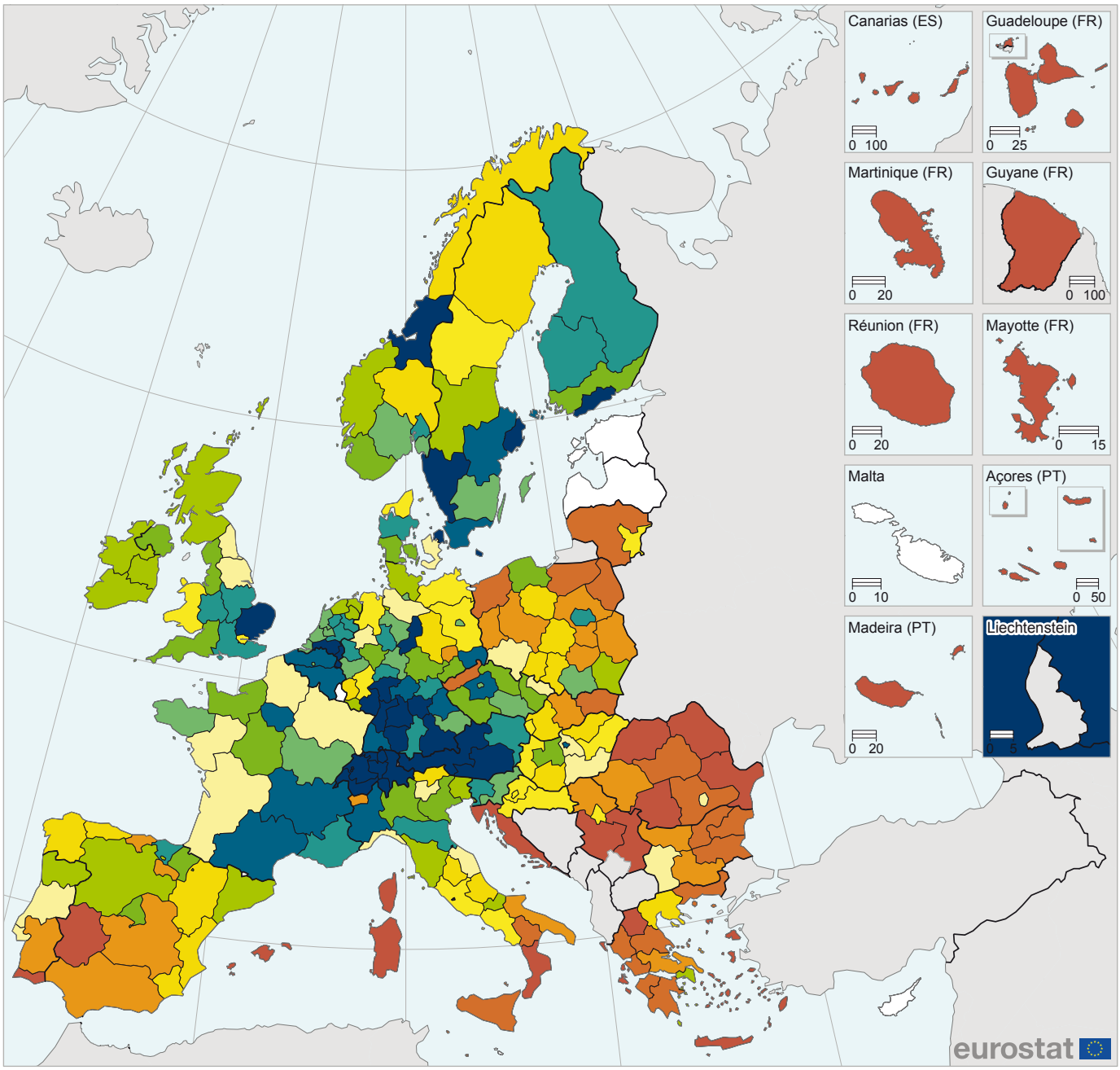
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Dresden (DED2)	206.8	2.24
2	Trøndelag (NO06)	206.8	2.13
3	Berlin (DE3)	206.8	2.12
4	Braunschweig (DE91)	206.8	2.05
5	Bremen (DE5)	206.8	1.90
6	Övre Norrland (SE33)	206.8	1.75
7	Köln (DEA2)	206.8	1.74
8	Leipzig (DED5)	206.8	1.72
9	Karlsruhe (DE12)	206.8	1.63
10	Oslo og Akershus (NO01)	206.8	1.61
11	Hovedstaden (DK01)	206.8	1.47
12	Östra Mellansverige (SE12)	206.8	1.47
13	Occitanie (FRJ)	204.7	1.45
14	Nord-Norge (NO07)	200.0	1.42
15	Praha (CZ01)	198.6	1.41
16	Vestlandet (NO05)	184.3	1.31
17	Kriti (EL43)	177.1	1.26
18	Mecklenburg-Vorpommern (DE8)	171.4	1.22
19	Ostösterreich (AT1)	165.7	1.18
20	Sydsverige (SE22)	164.3	1.17
21	Gießen (DE72)	162.9	1.16
22	Sachsen-Anhalt (DEE)	160.0	1.14
23	Thüringen (DEG)	157.1	1.12
24	Helsinki-Uusimaa (FI1B)	154.3	1.10
25	Oberbayern (DE21)	152.9	1.09
26	Brandenburg (DE4)	151.4	1.08
27	Rheinhessen-Pfalz (DEB3)	150.0	1.07
28	Ipeiros (EL54)	147.1	1.05
29	Nordjylland (DK05)	147.1	1.05
30	Lazio (ITI4)	147.1	1.05
31	Freiburg (DE13)	145.7	1.04
32	Südösterreich (AT2)	142.9	1.02
33	Dytiki Ellada (EL63)	140.0	1.00
34	Tübingen (DE14)	140.0	1.00
35	Hannover (DE92)	138.6	0.99
36	Stockholm (SE11)	137.1	0.98
37	Midtjylland (DK04)	134.3	0.96
38	Pohjois-ja Itä-Suomi (FI1D)	134.3	0.96
39	Hamburg (DE6)	132.9	0.95
40	Jihovýchod (CZ06)	132.9	0.95

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



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Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 05/2021

- Bottom low performers
- Middle low performers
- Top low performers
- Bottom moderate performers
- Middle moderate performers
- Top moderate performers
- Data not available
- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

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

Performance is not equally distributed within each country. On average, the best performing region performs 14 times higher than the worst performing region. In several countries this ratio is very high, in particular in France, Greece, and Serbia.

High performers are observed in 17 countries, with high shares (40% or above) in Austria, Belgium, Finland, Germany, Sweden, and Switzerland. High shares of strong performers are observed in Czechia, Ireland, the Netherlands, and Norway. High shares of moderate performers are observed in Croatia and high shares of low performers in Bulgaria, Greece, Spain, Poland, Portugal, Romania, and Serbia. Within most countries there is a significant degree of variation in performance groups, with regions in at least five performance groups in 12 countries.

The top 40 best performing regions are shown on the right. Six German regions - *Stuttgart* (DE11), *Braunschweig* (DE91), *Tübingen* (DE14), *Oberbayern* (DE21), *Karlsruhe* (DE12), *Rheinhessen-Pfalz* (DEB3) – are in the top 10. The top 20 includes regions from Austria, Finland, Norway, Sweden, and Switzerland, with all of them scoring equal or above 155.9% of the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.7	2	1	NL	2.6	2	10
BG	3.2	0	6	AT	2.1	3	0
CZ	8.0	1	7	PL	7.3	1	16
DK	6.0	2	3	PT	20.8	0	7
DE	17.3	16	22	RO	--	0	8
IE	1.0	0	3	SI	1.1	1	1
EL	92.0	0	13	SK	2.7	0	4
ES	25.5	1	18	FI	2.3	4	1
FR	55.9	4	10	SE	7.7	4	4
HR	4.1	0	4	NO	5.5	2	5
IT	15.0	2	19	CH	1.0	7	0
LT	2.9	0	2	RS	59.0	0	4
HU	4.8	1	7	UK	4.9	3	9

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

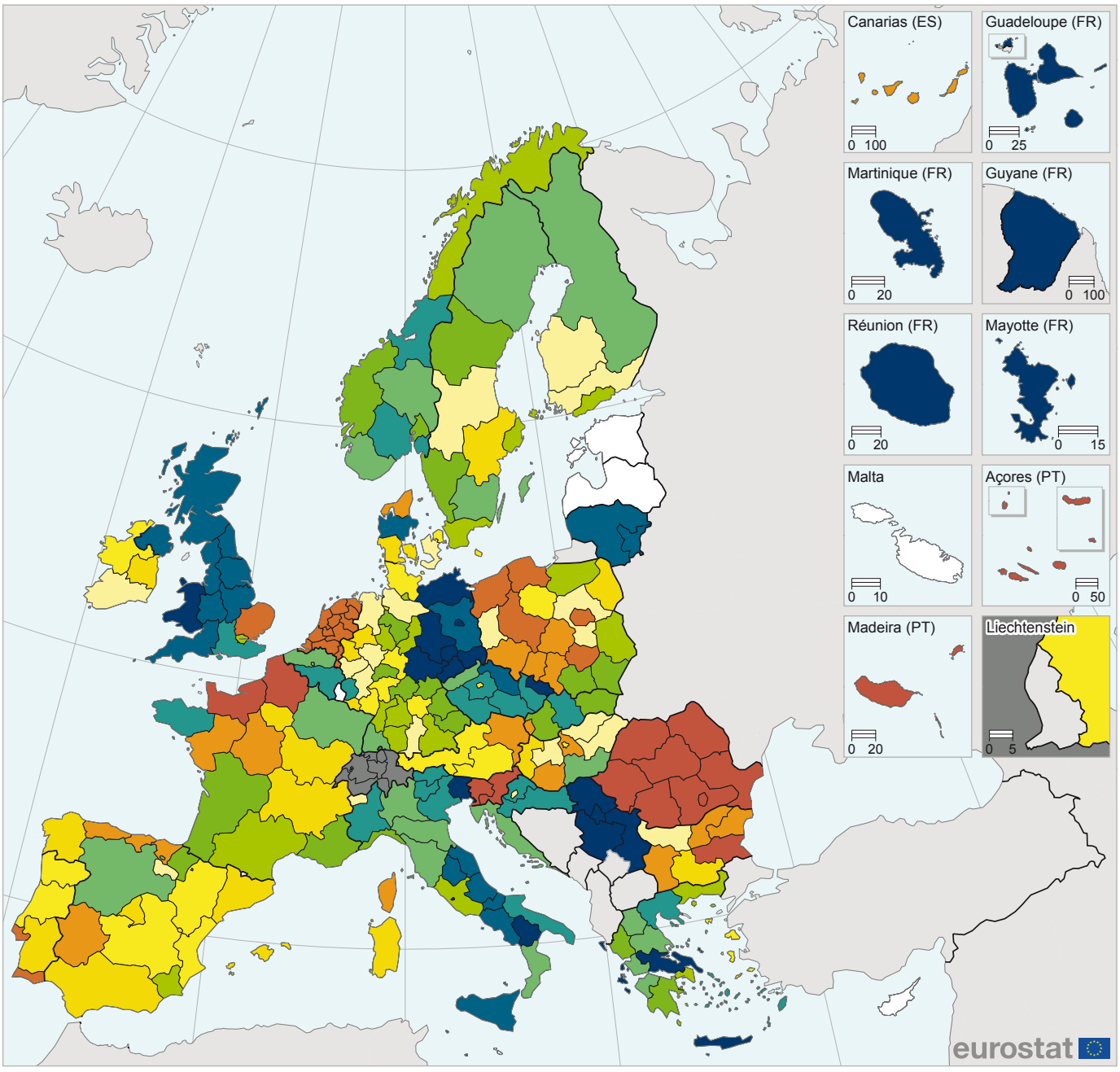
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Stuttgart (DE11)	192.2	7.25
2	Braunschweig (DE91)	192.2	6.46
3	Västsverige (SE23)	192.2	3.94
4	Tübingen (DE14)	192.2	3.84
5	Südösterreich (AT2)	192.2	3.38
6	Karlsruhe (DE12)	192.2	3.34
7	Hovedstaden (DK01)	192.2	3.25
8	Oberbayern (DE21)	192.2	3.03
9	Rheinhessen-Pfalz (DEB3)	192.2	2.96
10	East of England (UKH)	191.7	2.78
11	Stockholm (SE11)	187.6	2.72
12	Mittelfranken (DE25)	184.8	2.68
13	Trøndelag (NO06)	180.7	2.62
14	Darmstadt (DE71)	179.3	2.60
15	Helsinki-Uusimaa (FI1B)	161.4	2.34
16	Westösterreich (AT3)	157.9	2.29
17	Espace Mittelland (CH02)	155.9	2.26
18	Limburg (NL42)	155.9	2.26
19	Noord-Brabant (NL41)	155.9	2.26
20	Nordwestschweiz (CH03)	155.9	2.26
21	Ostschweiz (CH05)	155.9	2.26
22	Région lémanique (CH01)	155.9	2.26
23	Ticino (CH07)	155.9	2.26
24	Zentralschweiz (CH06)	155.9	2.26
25	Zürich (CH04)	155.9	2.26
26	Unterfranken (DE26)	154.5	2.24
27	Occitanie (FRJ)	154.2	2.24
28	Střední Čechy (CZ02)	144.1	2.09
29	Région wallonne (BE3)	140.7	2.04
30	Sydsverige (SE22)	138.6	2.01
31	Budapest (HU11)	138.6	2.01
32	Östra Mellansverige (SE12)	137.9	2.00
33	Vlaams Gewest (BE2)	137.9	2.00
34	Dresden (DED2)	137.9	2.00
35	Oberpfalz (DE23)	137.9	2.00
36	Île de France (FR1)	137.2	1.99
37	Åland (FI2)	124.8	1.81
38	Auvergne - Rhône-Alpes (FRK)	124.8	1.81
39	Piemonte (ITC1)	124.1	1.80
40	Freiburg (DE13)	122.8	1.78

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



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Cartography: Eurostat — GISCO, 05/2021

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- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

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

Performance is not equally distributed within each country. On average, the best performing region performs 9.5 times higher than the worst performing region. In France and the United Kingdom this ratio is very high, in all other countries it is below 10.

Regions showing highest performance are found in Czechia (6 regions belong to the high performers), Germany (9 regions), Greece (5 regions), Italy (13 regions), Serbia (all 4 regions), and the United Kingdom (10 regions). Low performance is observed in all regions in the Netherlands and Romania, and parts of France, Poland, Portugal, and Spain.

The top 40 best performing regions are shown on the right. For the top-4 regions the indicator values are very high at 10% or more. For calculating the normalised values for the regional innovation index, these values are treated as statistical outliers and replaced by lower values as can be seen in the relative to EU scores.

There are 21 regions in the 40 from Eastern and Southern Europe, with 9 regions in Italy, 4 each in Greece and Serbia, and 2 each in Czechia and Lithuania. In addition, there are 9 regions each from Germany and the United Kingdom and one from France.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.2	3	0	NL	1.0	0	12
BG	2.5	0	6	AT	1.6	0	3
CZ	4.0	7	1	PL	3.6	2	15
DK	4.2	1	4	PT	6.3	0	7
DE	5.8	16	22	RO	--	0	8
IE	1.2	0	3	SI	1.2	0	2
EL	6.8	10	3	SK	3.1	3	1
ES	--	2	17	FI	1.5	1	4
FR	65.1	6	8	SE	2.3	4	4
HR	2.2	3	1	NO	1.8	7	0
IT	4.9	18	3	CH	--	--	--
LT	1.0	2	0	RS	9.2	4	0
HU	3.2	1	7	UK	84.7	10	2

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

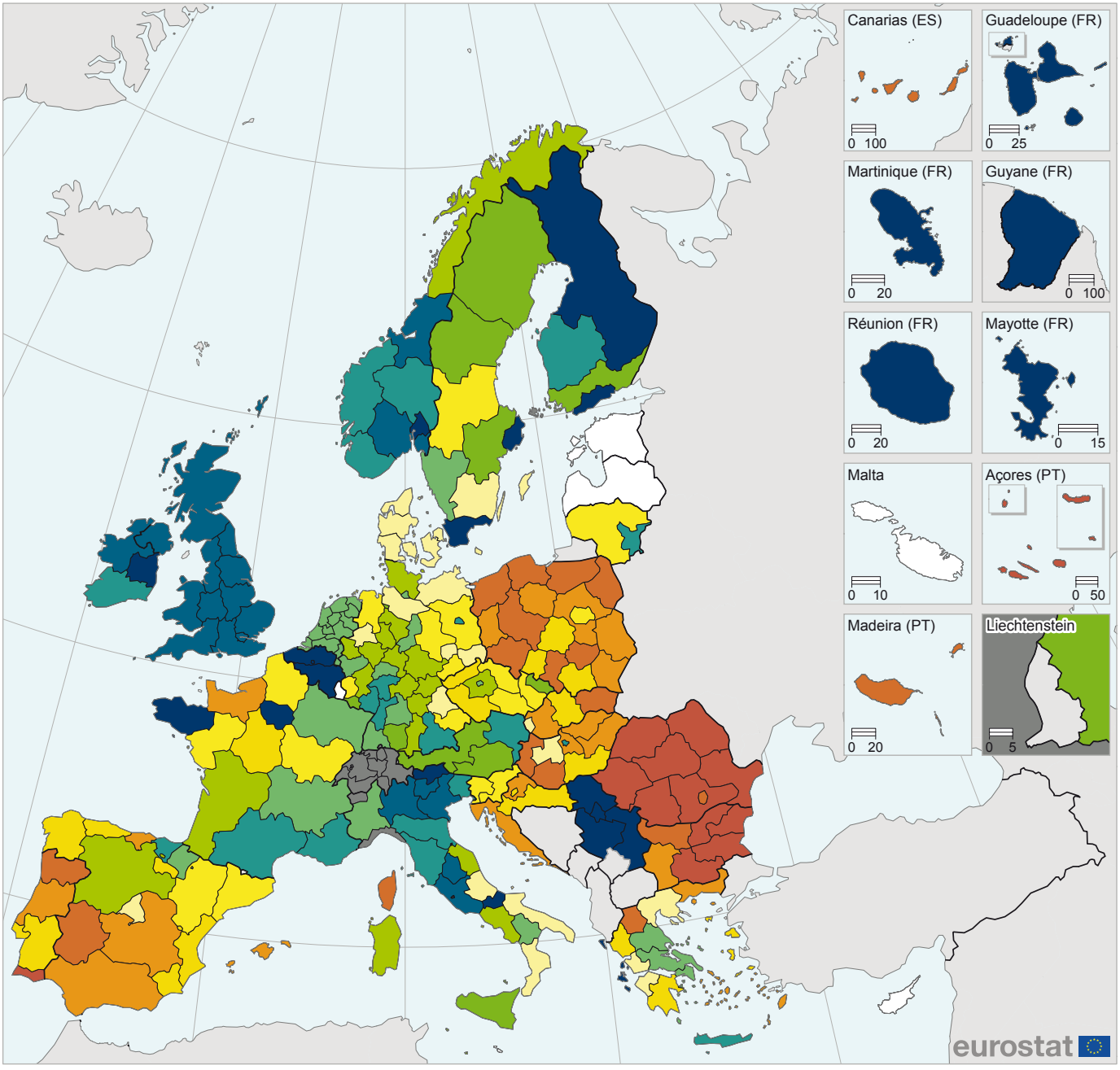
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Region Juzne i Istocne Srbije (RS22)	232.7	23.45
2	Wales (UKL)	232.7	22.33
3	Region Sumadije i Zapadne Srbije (RS21)	232.7	16.65
4	Régions ultrapériphériques françaises (FRY)	232.7	10.88
5	Region Vojvodine (RS12)	232.7	4.89
6	Ionia Nisia (EL62)	217.5	3.23
7	Beogradski region (RS11)	193.1	2.54
8	Basilicata (ITF5)	177.0	2.14
9	Friuli-Venezia Giulia (ITH4)	176.1	2.11
10	Leipzig (DED5)	175.7	2.10
11	Kriti (EL43)	175.3	2.10
12	Sachsen-Anhalt (DEE)	173.8	2.06
13	Dresden (DED2)	171.3	2.00
14	Berlin (DE3)	170.1	1.97
15	Thüringen (DEG)	169.8	1.96
16	Chemnitz (DED4)	163.6	1.83
17	Sterea Ellada (EL64)	163.1	1.81
18	Moravskoslezsko (CZ08)	163.1	1.81
19	Mecklenburg-Vorpommern (DE8)	161.3	1.77
20	Brandenburg (DE4)	160.7	1.76
21	Marche (ITI3)	154.7	1.63
22	Yorkshire and The Humber (UKE)	153.0	1.60
23	North East (UKC)	152.9	1.59
24	West Midlands (UKG)	150.6	1.55
25	Sicilia (ITG1)	149.6	1.53
26	Abruzzo (ITF1)	149.6	1.53
27	North West (UKD)	148.3	1.50
28	South West (UKK)	147.0	1.47
29	Molise (ITF2)	145.7	1.45
30	Severovýchod (CZ05)	143.7	1.41
31	Northern Ireland (UKN)	143.6	1.41
32	Sostines regionas (LT01)	143.5	1.40
33	Vidurio ir vakaru Lietuvos regionas (LT02)	143.2	1.40
34	Umbria (ITI2)	143.0	1.39
35	Campania (ITF3)	141.7	1.37
36	East Midlands (UKF)	141.1	1.36
37	Scotland (UKM)	141.0	1.36
38	Midtjylland (DK04)	139.1	1.32
39	Provincia Autonoma Trento (ITH2)	138.1	1.30
40	Kentriki Makedonia (EL52)	137.0	1.28

Innovation expenditures per person employed (SMEs)



Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Innovation expenditures per person employed (SMEs)

This is a new indicator in the RIS and captures differences in the relative amounts of innovation spent per person employed. Performance is not equally distributed within each country. On average, the best performing region performs 7 times higher than the worst performing region. In France and Romania differences are very high.

Most of the high performers are regions in Belgium (all 3), Finland (3), France (5), Germany (5), Greece (2), Ireland (all 3), Italy (10), Norway (6), Serbia (all 4), Sweden (2), and the United Kingdom (all 12). Most of the low performers are regions in Bulgaria (all 6), Greece (3), Hungary (5), Poland (13), Portugal (5), Romania (all 8) and Spain (6).

The top 40 best performing regions are shown on the right. For several regions, among others the Serbian regions, the indicator values are very high at PPS 10,000 or more. For calculating the normalised values for the regional innovation index, most of these values are treated as statistical outliers and replaced by lower values as can be seen in the relative to EU scores.

The top 40 regions are dominated by regions from Belgium, Italy, Serbia and the United Kingdom. Regional data for the UK are not available for this indicator, therefore for all regions the same national UK performance score has been used. The UK scores well above average which explains why all UK regions are included in the top 40.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.6	3	0	NL	--	--	--
BG	2.7	1	5	AT	1.3	3	0
CZ	1.9	8	0	PL	3.8	14	3
DK	--	--	--	PT	9.0	4	3
DE	1.7	38	0	RO	76.3	0	8
IE	2.0	3	0	SI	--	--	--
EL	7.8	13	0	SK	2.5	4	0
ES	4.0	17	0	FI	2.6	4	0
FR	36.5	14	0	SE	2.8	8	0
HR	1.7	4	0	NO	2.5	7	0
IT	3.9	19	0	CH	--	--	--
LT	1.7	2	0	RS	4.0	4	0
HU	3.9	8	0	UK	--	--	--

Definition of the indicator

Numerator: Sum of total innovation expenditure for SMEs 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

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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Régions ultrapériphériques françaises (FRY)	351.2	39271.0
2	Region Sumadije i Zapadne Srbije (RS21)	351.2	28354.8
3	Region Juzne i Istocne Srbije (RS22)	351.2	25863.0
4	Région wallonne (BE3)	351.2	17117.4
5	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	351.2	15488.3
6	Provincia Autonoma Bolzano/Bozen (ITH1)	351.2	12684.2
7	Eastern and Midland (IE06)	351.2	11493.2
8	Helsinki-Uusimaa (FI1B)	349.8	10631.9
9	Vlaams Gewest (BE2)	346.4	10430.3
10	Region Vojvodine (RS12)	335.1	9781.2
11	Bretagne (FRH)	327.6	9364.7
12	Oslo og Akershus (NO01)	322.2	9067.7
13	Ionia Nisia (EL62)	313.8	8615.2
14	Stockholm (SE11)	311.0	8465.8
15	Sydsverige (SE22)	309.8	8404.6
16	Molise (ITF2)	295.3	7657.4
17	Île de France (FR1)	293.5	7567.6
18	Beogradski region (RS11)	283.7	7086.9
19	Pohjois-ja Itä-Suomi (FI1D)	279.0	6862.1
20	Umbria (ITI2)	275.3	6691.4
21	Provincia Autonoma Trento (ITH2)	274.6	6658.3
22	United Kingdom – all 12 regions	272.1	6542.6
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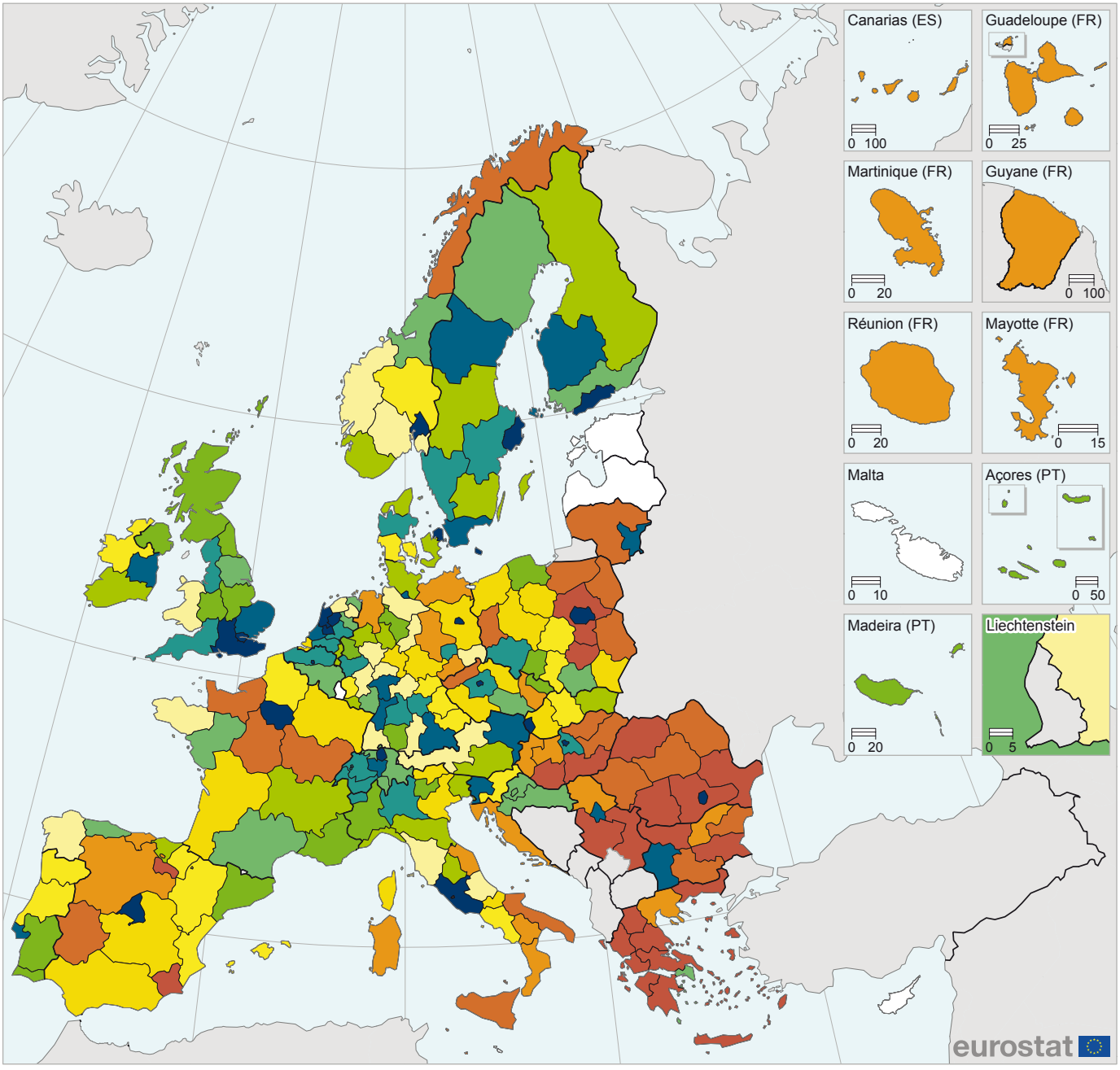
34	Trøndelag (NO06)	270.7	6474.9
35	Sør-Østlandet (NO03)	267.3	6321.9
36	Veneto (ITH3)	266.2	6271.5
37	Northern and Western (IE04)	264.0	6170.3
38	Lombardia (ITC4)	262.3	6094.9
39	Lazio (ITI4)	259.4	5963.8
40	Friuli-Venezia Giulia (ITH4)	253.0	5685.0

Employed ICT specialists as a percentage of total employment



Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Employed ICT specialists as a percentage of total employment

This is a new indicator in the RIS and measures the presence of ICT specialists. There is widespread variation in regional performance, not only across countries but also within countries. There is a strong capital region effect present with most of the capital regions in Europe being part of the high and strong performing regions.

Belgium, Finland, the Netherlands, Sweden, and Switzerland are well represented with high shares of regions being high performers. Bulgaria, Czechia, France, Germany, Italy, Lithuania, Norway, Poland, Romania, Serbia and Spain, show widespread variation within their countries with regions belonging to any of the high performing groups and regions belonging to any of the low performing groups.

Except for capital regions, most of the regions in Eastern Europe belong to the moderate and low performing groups. High shares of low performers are observed in Bulgaria, Greece, Hungary, Romania, and Serbia.

The top 40 best performing regions are shown on the right. It mostly consists of capital regions with a few exceptions in the top-25 such as regions in the Netherlands (*Utrecht* (NL31) and *Flevoland* (NL23)), Finland (*Åland* (FI2)) and Germany (*Hamburg* (DE6) and *Oberbayern* (DE21)).

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.9	3	0	NL	4.0	8	4
BG	6.1	1	5	AT	2.1	1	2
CZ	8.3	2	6	PL	12.3	2	15
DK	3.2	2	3	PT	2.8	1	6
DE	5.1	10	28	RO	11.0	1	7
IE	2.6	1	2	SI	2.0	1	1
EL	8.2	1	12	SK	4.5	1	3
ES	7.1	2	17	FI	3.4	4	1
FR	6.3	2	12	SE	4.2	5	3
HR	2.1	0	4	NO	5.6	2	5
IT	4.8	3	18	CH	2.4	6	1
LT	4.3	1	1	RS	5.4	1	3
HU	7.6	2	6	UK	3.5	6	6

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. As regional data are not available, estimates are based on the regional variation in Employment in information and communication (NACE J)

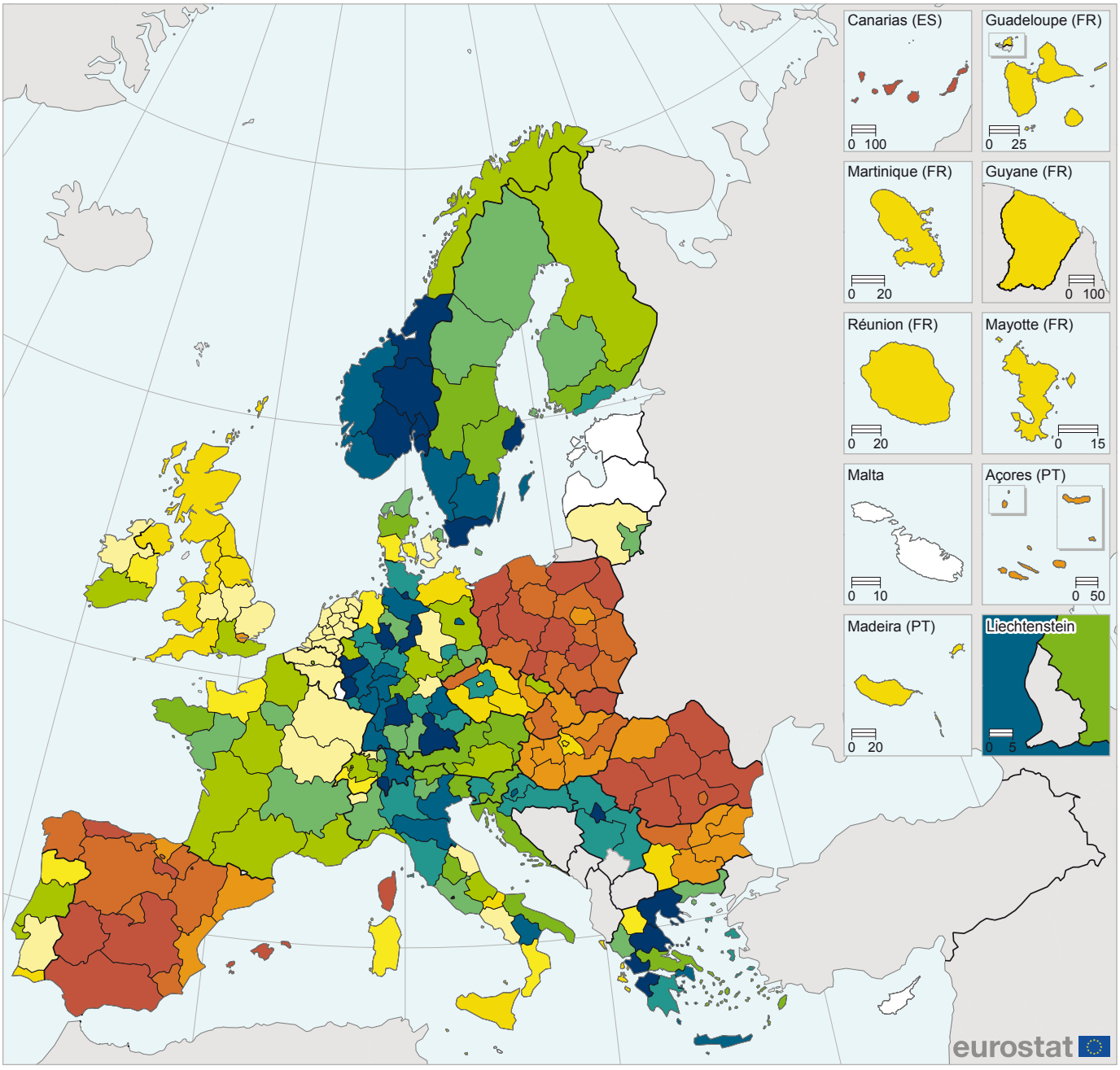
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Stockholm (SE11)	200.4	13.7
2	Helsinki-Uusimaa (FI1B)	200.4	11.5
3	Praha (CZ01)	200.4	11.3
4	London (UKI)	200.4	10.3
5	Bratislavský kraj (SK01)	200.4	10.0
6	Île de France (FR1)	200.4	9.6
7	Oslo og Akershus (NO01)	200.4	9.3
8	Warszawski stoleczny (PL91)	200.4	9.3
9	Zürich (CH04)	200.4	9.3
10	Budapest (HU11)	200.4	9.2
11	Bucuresti - Ilfov (RO32)	200.4	9.0
12	Berlin (DE3)	200.4	9.0
13	Utrecht (NL31)	200.4	8.8
14	Comunidad de Madrid (ES3)	200.4	8.8
15	Hovedstaden (DK01)	200.4	8.6
16	South East (UKJ)	200.4	8.2
17	Noord-Holland (NL32)	200.4	8.0
18	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	200.4	7.4
19	Lazio (ITI4)	199.4	7.4
20	Flevoland (NL23)	194.1	7.2
21	Lisboa (PT17)	191.3	7.1
22	Åland (FI2)	183.5	6.8
23	Eastern and Midland (IE06)	181.2	6.7
24	Hamburg (DE6)	179.2	6.7
25	Oberbayern (DE21)	176.7	6.6
26	Yugozapaden (BG41)	173.7	6.5
27	Sostines regionas (LT01)	172.2	6.4
28	Karlsruhe (DE12)	170.4	6.3
29	Ostösterreich (AT1)	161.6	6.0
30	East of England (UKH)	160.9	6.0
31	Sydsverige (SE22)	160.8	6.0
32	Beogradski region (RS11)	156.6	5.9
33	Länsi-Suomi (FI19)	148.6	5.6
34	Zuid-Holland (NL33)	147.3	5.5
35	Mellersta Norrland (SE32)	141.8	5.4
36	Darmstadt (DE71)	140.9	5.3
37	Zahodna Slovenija (SI04)	140.4	5.3
38	Zentralschweiz (CH06)	137.5	5.2
39	Östra Mellansverige (SE12)	137.4	5.2
40	Köln (DEA2)	136.3	5.2

SMEs introducing product innovations as percentage of SMEs



Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

SMEs introducing product innovations as percentage of SMEs

Performance is not equally distributed within each country. On average, the best performing region performs 2 times higher than the worst performing region. In Spain and Romania differences are high.

Most of the high performers are regions in Croatia (3), Germany (24), Greece (7), Italy (5), Norway (6), Serbia (all 4), and Sweden (4). Most of the low performers are in the South and East of Europe, particularly regions in Bulgaria (5), Hungary (6), Poland (all 17), Romania (all 8), Slovakia (all 4), and Spain (all 19). In several countries all regions belong to similar performance groups including Austria (all strong performers), the Netherlands (all moderate performers as there are no regional CIS data), Poland, Romania, Slovakia, and Spain (all low performers).

The top 40 best performing regions are shown on the right. Almost half of the regions are from Germany (17), 6 from Norway, 5 from Greece, and 4 from Sweden. *Trier* (DEB2) is the best performing region, followed by *Innlandet* (NO02) and *Beogradski region* (RS11). The first 8 regions all perform almost 100% above the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.1	3	0	NL	--	--	--
BG	1.5	0	6	AT	1.1	3	0
CZ	2.7	5	3	PL	1.7	0	17
DK	1.3	5	0	PT	1.7	5	2
DE	2.4	38	0	RO	5.7	0	8
IE	1.1	3	0	SI	1.2	2	0
EL	2.1	12	1	SK	1.4	0	4
ES	11.1	0	19	FI	1.3	5	0
FR	4.1	13	1	SE	1.5	8	0
HR	1.3	4	0	NO	1.2	7	0
IT	1.9	20	1	CH	1.7	7	0
LT	1.3	2	0	RS	1.3	4	0
HU	1.8	1	7	UK	1.4	6	6

Definition of the indicator

Numerator: Number of SMEs that 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

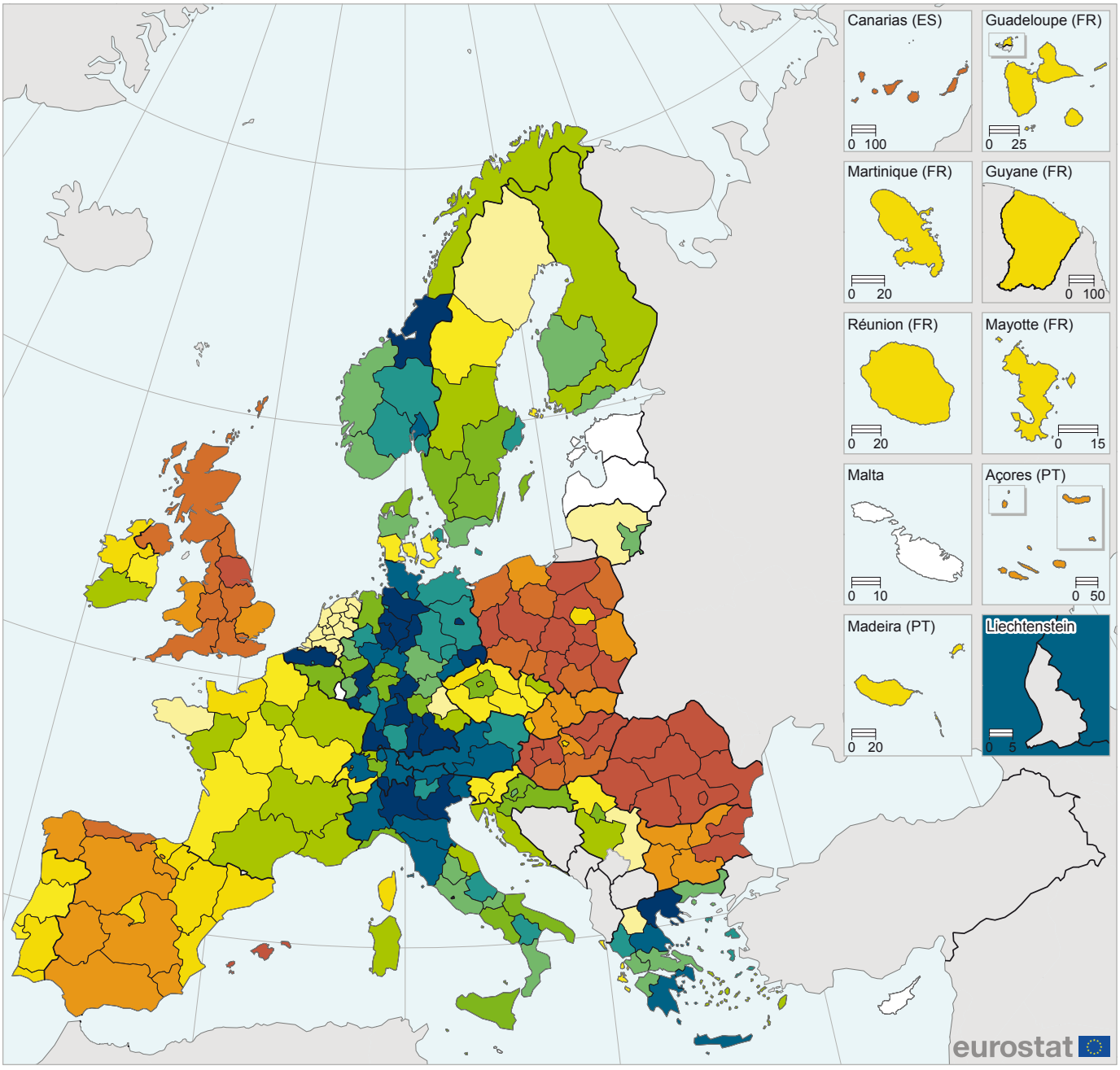
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Trier (DEB2)	196.3	59.1
2	Innlandet (NO02)	196.3	49.9
3	Beogradski region (RS11)	196.3	48.6
4	Stockholm (SE11)	196.3	47.5
5	Braunschweig (DE91)	196.3	47.1
6	Kentriki Makedonia (EL52)	196.3	47.0
7	Detmold (DEA4)	196.3	47.0
8	Oslo og Akershus (NO01)	196.3	46.8
9	Ticino (CH07)	195.7	45.5
10	Köln (DEA2)	195.6	45.5
11	Agder og Rogaland (NO04)	195.0	45.4
12	Oberbayern (DE21)	194.9	45.4
13	Dytiki Ellada (EL63)	193.9	45.1
14	Hamburg (DE6)	193.3	45.0
15	Sydsverige (SE22)	192.2	44.8
16	Trøndelag (NO06)	191.6	44.6
17	Thessalia (EL61)	187.7	43.8
18	Stuttgart (DE11)	186.3	43.4
19	Gießen (DE72)	185.5	43.3
20	Sør-Østlandet (NO03)	185.5	43.3
21	Berlin (DE3)	184.9	43.1
22	Västsverige (SE23)	183.3	42.8
23	Koblenz (DEB1)	183.1	42.7
24	Attiki (EL3)	182.5	42.6
25	Grad Zagreb (HR05)	182.3	42.5
26	Darmstadt (DE71)	181.5	42.4
27	Karlsruhe (DE12)	180.7	42.2
28	Vestlandet (NO05)	180.3	42.1
29	Nord-Norge (NO07)	180.0	42.0
30	Veneto (ITH3)	179.7	42.0
31	Småland med öarna (SE21)	174.4	40.8
32	Oberpfalz (DE23)	174.2	40.7
33	Lüneburg (DE93)	172.0	40.2
34	Basilicata (ITF5)	171.8	40.2
35	Ostschweiz (CH05)	171.7	40.2
36	Freiburg (DE13)	169.8	39.8
37	Kriti (EL43)	169.5	39.7
38	Rheinhessen-Pfalz (DEB3)	169.5	39.7
39	Emilia-Romagna (ITH5)	169.4	39.7
40	Kassel (DE73)	168.6	39.5

SMEs introducing business process innovations as percentage of SMEs



Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

SMEs introducing business process innovations as percentage of SMEs

Performance is not equally distributed within each country. On average, the best performing region performs 1.9 times higher than the worst performing region. In Romania differences are very high.

Most of the high performers are regions in Germany (26), Greece (7), Italy (10), Norway (4), and Switzerland (4). Most of the low performers are in East of Europe, in particular regions in Bulgaria (all 6), Hungary (7), Poland (16), Romania (all 8), and Slovakia (3). High numbers of high performers are also seen in Spain (12) and the United Kingdom (all 12 regions). In several countries all regions belong to similar performance groups, including Austria (all high performers), Croatia (all strong performers), the Netherlands and Slovenia (all moderate performers, in the case of the Netherlands as there are no regional CIS data), Bulgaria, Romania, and the United Kingdom (all low performers).

The top 40 best performing regions are shown on the right. Almost half of the regions are from Germany (18), 7 from Italy, 5 from Greece, and 4 from Switzerland. *Unterfranken* (DE26) and *Koblenz* (DEB1) are the two best performing regions, and there are 4 German regions in the top 5. The first 18 regions all perform close to 87% above the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.3	3	0	NL	--	--	--
BG	1.3	0	6	AT	1.1	3	0
CZ	1.7	7	1	PL	2.2	0	17
DK	1.5	4	1	PT	1.6	0	7
DE	1.6	38	0	RO	10.4	0	8
IE	1.3	2	1	SI	1.1	1	1
EL	1.7	12	1	SK	1.3	0	4
ES	3.5	0	19	FI	1.5	4	1
FR	1.7	9	5	SE	1.3	8	0
HR	1.2	4	0	NO	1.2	7	0
IT	1.3	21	0	CH	1.8	6	1
LT	1.2	2	0	RS	1.2	4	0
HU	1.8	0	8	UK	1.2	0	12

Definition of the indicator

Numerator: Number of SMEs that 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

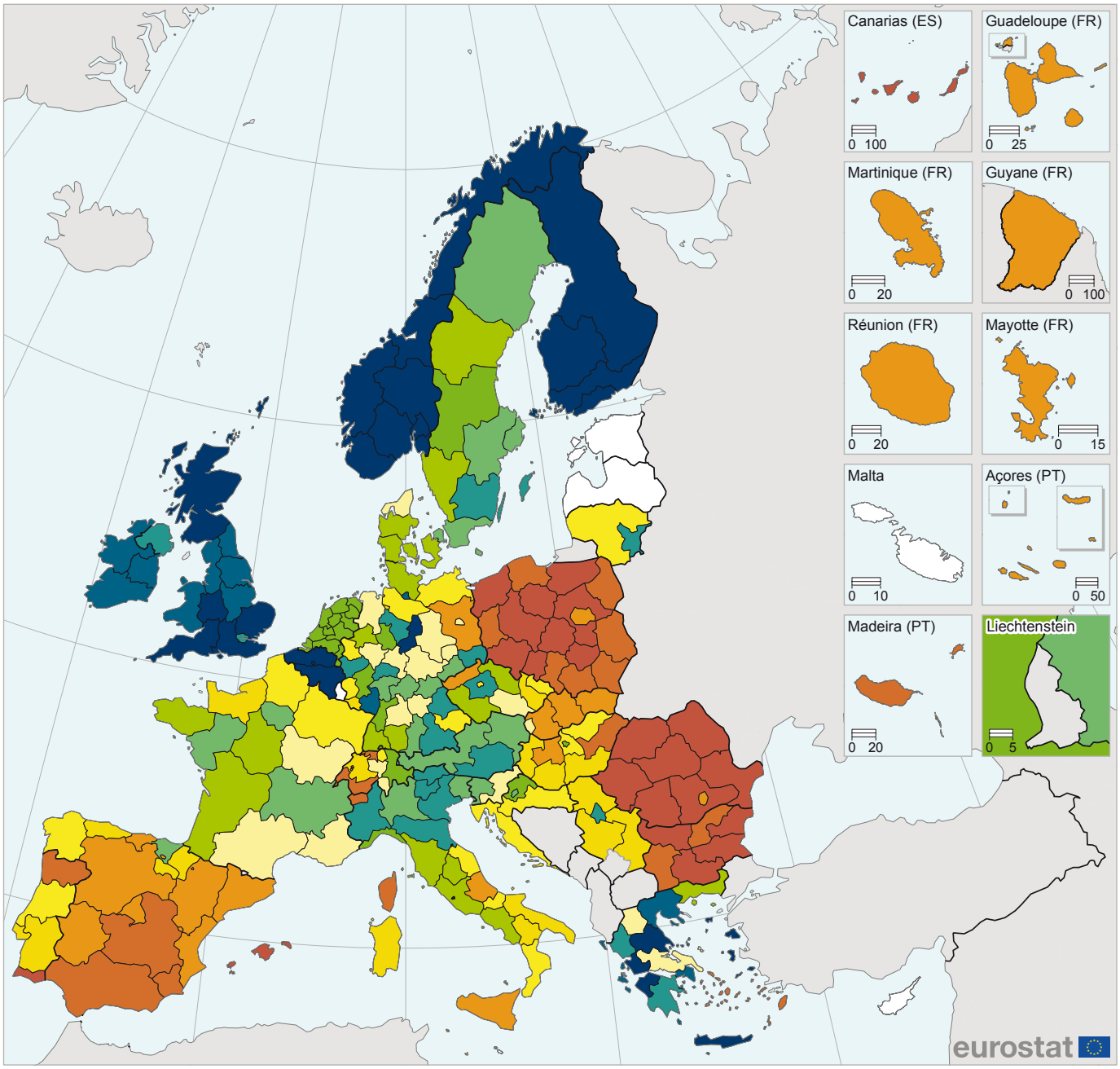
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Unterfranken (DE26)	186.7	64.9
2	Koblenz (DEB1)	186.7	64.4
3	Ticino (CH07)	186.7	62.6
4	Oberbayern (DE21)	186.7	62.5
5	Schwaben (DE27)	186.7	62.2
6	Vlaams Gewest (BE2)	186.7	60.1
7	Detmold (DEA4)	186.7	59.5
8	Hannover (DE92)	186.7	59.5
9	Lüneburg (DE93)	186.7	59.3
10	Berlin (DE3)	186.7	59.2
11	Saarland (DEC)	186.7	59.0
12	Stuttgart (DE11)	186.7	58.7
13	Dresden (DED2)	186.7	58.6
14	Freiburg (DE13)	186.7	58.5
15	Veneto (ITH3)	186.7	58.2
16	Lombardia (ITC4)	186.7	57.1
17	Kentriki Makedonia (EL52)	186.7	57.1
18	Braunschweig (DE91)	186.7	56.9
19	Emilia-Romagna (ITH5)	186.1	56.7
20	Westösterreich (AT3)	184.3	56.3
21	Innlandet (NO02)	183.0	55.9
22	Espace Mittelland (CH02)	182.7	55.9
23	Trøndelag (NO06)	182.4	55.8
24	Attiki (EL3)	182.3	55.8
25	Kriti (EL43)	181.1	55.5
26	Friuli-Venezia Giulia (ITH4)	180.9	55.4
27	Kassel (DE73)	180.6	55.3
28	Karlsruhe (DE12)	180.6	55.3
29	Chemnitz (DED4)	180.2	55.2
30	Ostschweiz (CH05)	177.3	54.5
31	Oslo og Akershus (NO01)	176.6	54.3
32	Zürich (CH04)	176.4	54.3
33	Peloponnisos (EL65)	176.0	54.2
34	Arnsberg (DEA5)	175.9	54.2
35	Provincia Autonoma Bolzano/Bozen (ITH1)	175.1	54.0
36	Toscana (ITI1)	173.5	53.6
37	Piemonte (ITC1)	172.6	53.3
38	Südösterreich (AT2)	172.1	53.2
39	Thessalia (EL61)	171.5	53.1
40	Schleswig-Holstein (DEF)	171.2	53.0

Innovative SMEs collaborating with others as percentage of SMEs



0 200 400 600 800 km

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 05/2021

- Bottom low performers
- Middle low performers
- Top low performers
- Bottom moderate performers
- Middle moderate performers
- Top moderate performers
- Data not available
- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Innovative SMEs collaborating with others as percentage of SMEs

Regional performance on SMEs with innovation co-operation activities is widely spread across different EU regions. Regions in Belgium, Finland, Ireland, Norway, and the United Kingdom, stand out in performance on this indicator with all regions belonging to the high performers group. High shares of strong performers are seen in Austria, Denmark, the Netherlands, and Sweden. High shares of moderate performers are seen in Czechia, Hungary, Serbia, and Switzerland. High shares of low performers are seen in Bulgaria, Poland, Portugal and Spain.

Performance is not equally distributed within each country. On average, the best performing region performs 2.9 times higher than the worst performing region. In Romania differences are very high with the best performing region performing 16 times higher than the worst performing region.

The top 40 best performing regions are shown on the right. The list is dominated by regions in Finland, Greece, Norway, and the United Kingdom. *Trøndelag* (NO06) in Norway ranks first, followed by *Dytiki Ellada* (EL63) in Greece, and *Nord-Norge* (NO07) in Norway.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.1	3	0	NL	--	--	--
BG	2.5	0	6	AT	1.1	3	0
CZ	2.4	3	5	PL	2.7	0	17
DK	1.2	4	1	PT	4.2	0	7
DE	3.5	23	15	RO	16.2	0	8
IE	1.1	3	0	SI	1.3	1	1
EL	6.0	11	2	SK	1.9	1	3
ES	--	1	18	FI	1.1	5	0
FR	4.3	8	6	SE	1.2	8	0
HR	1.7	2	2	NO	1.6	7	0
IT	5.2	12	9	CH	3.3	1	6
LT	1.6	1	1	RS	2.1	1	3
HU	2.6	1	7	UK	1.5	12	0

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

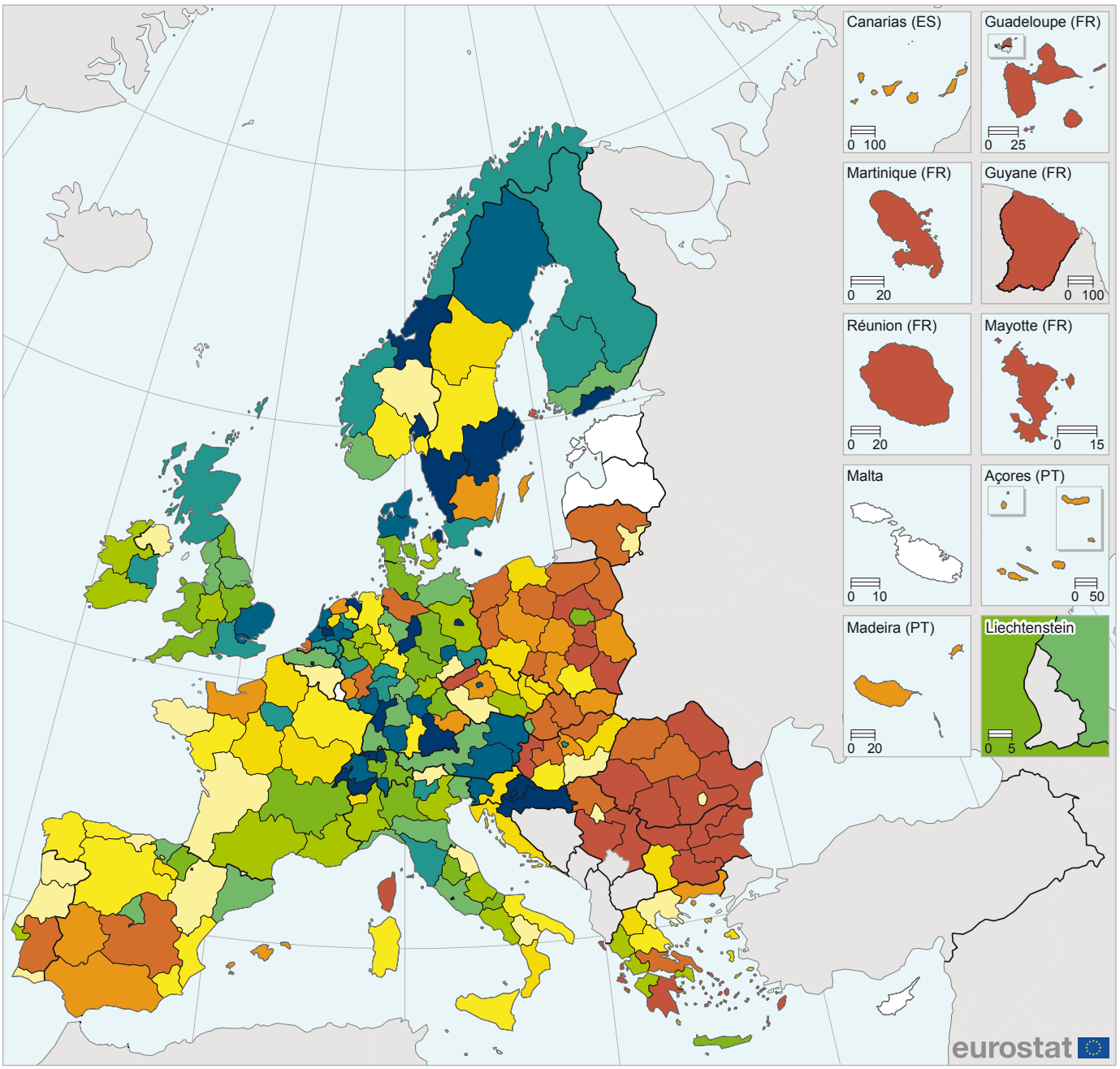
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Trøndelag (NO06)	191.7	38.6
2	Dytiki Ellada (EL63)	191.7	32.5
3	Nord-Norge (NO07)	191.7	31.0
4	Agder og Rogaland (NO04)	191.7	29.8
5	Voreio Aigaio (EL41)	191.7	29.2
6	Länsi-Suomi (FI19)	191.7	29.2
7	Vestlandet (NO05)	191.7	29.0
8	Etelä-Suomi (FI1C)	191.7	28.3
9	South East (UKJ)	191.7	28.1
10	Åland (FI2)	191.7	27.6
11	West Midlands (UKG)	191.7	27.1
12	Helsinki-Uusimaa (FI1B)	191.7	27.1
13	Vlaams Gewest (BE2)	191.7	27.0
14	East of England (UKH)	191.7	26.8
15	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	191.7	26.8
16	Pohjois-ja Itä-Suomi (FI1D)	191.7	26.4
17	Sør-Østlandet (NO03)	191.7	26.1
18	Braunschweig (DE91)	191.7	25.6
19	Kriti (EL43)	191.7	25.6
20	Oslo og Akershus (NO01)	191.7	24.7
21	Innlandet (NO02)	191.7	24.6
22	Thessalia (EL61)	191.7	24.2
23	Région wallonne (BE3)	191.7	24.1
24	South West (UKK)	191.7	24.0
25	Scotland (UKM)	191.7	23.6
26	Yorkshire and The Humber (UKE)	191.3	23.5
27	Northern and Western (IE04)	186.8	23.0
28	Southern (IE05)	183.9	22.6
29	East Midlands (UKF)	178.5	22.0
30	Hamburg (DE6)	177.7	21.9
31	Wales (UKL)	176.2	21.7
32	Rheinhessen-Pfalz (DEB3)	173.6	21.4
33	North East (UKC)	172.0	21.2
34	Attiki (EL3)	171.8	21.1
35	North West (UKD)	171.0	21.0
36	Kentriki Makedonia (EL52)	168.8	20.8
37	Eastern and Midland (IE06)	167.2	20.6
38	Ionia Nisia (EL62)	166.9	20.5
39	London (UKI)	162.4	20.0
40	Provincia Autonoma Trento (ITH2)	162.2	20.0

Public-private co-publications per million population



Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Public-private co-publications per million population

Performance on public-private co-publications is strongly affected by the presence of a university or research institute in the region. Capital regions score well on this indicator. This also explains the wide spread in performance within countries between the best and worst performing region. In total 124 regions perform above and 116 regions below the EU average.

High shares (50% or above) of high performers are observed in Austria, Croatia, Denmark, Finland, the Netherlands, Norway, Sweden, and Switzerland. High shares of strong performers are observed in Ireland, Italy, and the United Kingdom. High shares of moderate performers are observed in Czechia and France. High shares of low performers are observed in Bulgaria, Hungary, Poland, Romania, Serbia, and Slovakia.

The top 40 best performing regions are shown on the right. The top-40 is dominated by regions in Germany (10 regions), Netherlands (5), Switzerland (5), Sweden (4), Croatia (3) and Denmark (3). *Nordwestschweiz* (CH03) is the overall best performing region, followed by *Trøndelag* (NO06) and *Zürich* (CH04). Of note, the data is highly skewed given the nature of the indicator with high performance in urban regions. The ratio of best to worst region is in several countries high.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	4.0	3	0	NL	25.5	8	4
BG	14.8	0	6	AT	2.0	3	0
CZ	21.9	2	6	PL	33.0	1	16
DK	6.0	5	0	PT	4.5	1	6
DE	14.7	29	9	RO	23.0	1	7
IE	1.7	3	0	SI	5.0	1	1
EL	28.7	5	8	SK	6.9	1	3
ES	--	5	14	FI	--	4	1
FR	18.2	4	10	SE	8.7	5	3
HR	7.3	3	1	NO	8.8	5	2
IT	4.7	14	7	CH	5.9	7	0
LT	4.8	1	1	RS	10.1	0	4
HU	13.7	1	7	UK	3.0	12	0

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

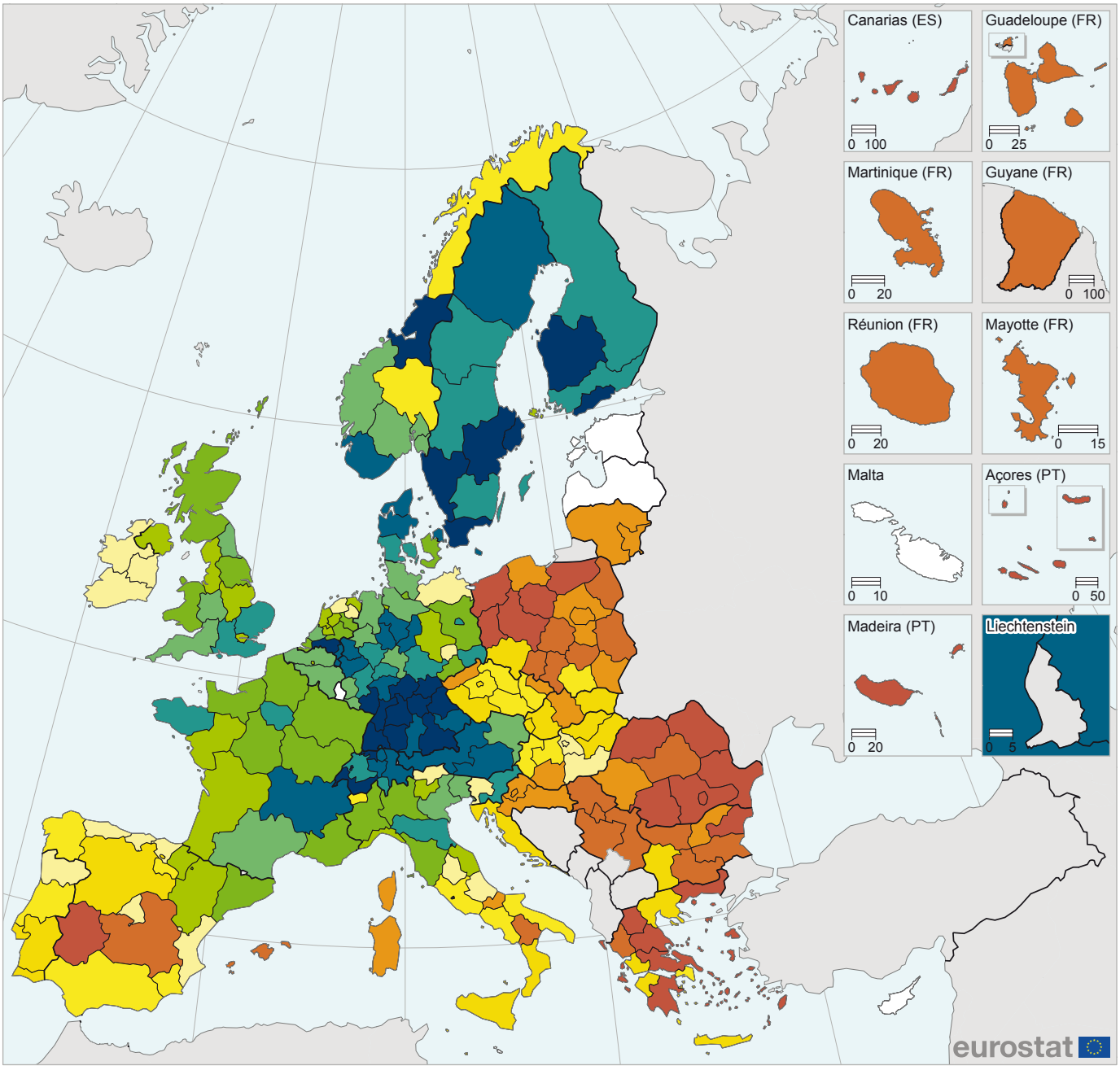
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Nordwestschweiz (CH03)	201.8	1662.5
2	Trøndelag (NO06)	201.8	1483.4
3	Zürich (CH04)	201.8	1390.9
4	Hovedstaden (DK01)	201.8	1380.8
5	Groningen (NL11)	201.8	1198.2
6	Région lémanique (CH01)	201.8	1196.6
7	Utrecht (NL31)	201.8	1105.9
8	Oslo og Akershus (NO01)	201.8	998.0
9	Stockholm (SE11)	201.8	871.7
10	Västsverige (SE23)	201.8	858.4
11	Helsinki-Uusimaa (FI1B)	201.8	842.7
12	Grad Zagreb (HR05)	201.8	800.2
13	Panonska Hrvatska (HR02)	201.8	800.2
14	Sjeverna Hrvatska (HR06)	201.8	800.2
15	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	201.8	799.4
16	Oberbayern (DE21)	201.8	795.6
17	Berlin (DE3)	201.8	794.1
18	Karlsruhe (DE12)	200.0	778.4
19	Braunschweig (DE91)	197.1	756.1
20	Östra Mellansverige (SE12)	193.0	724.8
21	Südösterreich (AT2)	191.6	714.7
22	Praha (CZ01)	190.7	707.6
23	Tübingen (DE14)	189.9	701.7
24	Zuid-Holland (NL33)	189.0	695.5
25	Nordjylland (DK05)	184.8	664.5
26	Hamburg (DE6)	184.3	661.0
27	Noord-Holland (NL32)	182.5	648.0
28	Övre Norrland (SE33)	181.1	638.1
29	Bremen (DE5)	180.1	631.2
30	Gelderland (NL22)	178.2	617.9
31	Midtjylland (DK04)	176.4	605.4
32	Leipzig (DED5)	175.8	601.5
33	Zahodna Slovenija (SI04)	174.9	595.5
34	London (UKI)	174.7	593.9
35	Mittelfranken (DE25)	172.8	580.8
36	Ostösterreich (AT1)	172.5	579.2
37	East of England (UKH)	171.0	569.1
38	Espace Mittelland (CH02)	170.6	566.6
39	Rheinhessen-Pfalz (DEB3)	170.6	566.3
40	Ticino (CH07)	169.3	557.6

PCT patent applications per billion regional GDP



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- Bottom low performers
- Middle low performers
- Top low performers
- Bottom moderate performers
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Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

PCT patent applications per billion regional GDP

Performance is not equally distributed within each country. On average, the best performing region performs more than 7 times higher than the worst performing region. In several countries this ratio is much higher, in particular in Portugal.

Top high performing regions are found in 6 countries: Germany (10), Sweden (4), Finland and Switzerland (2 each), and the Netherlands and Norway (1 each). There is a strong geographical concentration in most countries with high shares of regions belonging to similar performance groups. All regions in Sweden and Switzerland, and more than half of the regions in Austria, Denmark, Finland and Germany are high performers. All regions in Belgium, and more than half of the regions in France, the Netherlands and the United Kingdom are strong performers. All regions in Ireland, and more than half of the regions in Czechia, Hungary, Portugal, Slovakia, and Spain are moderate performers. All regions in Lithuania, Romania and Serbia, and more than half of the regions in Bulgaria, Croatia, Greece, and Poland are low performers.

The top 40 best performing regions are shown on the right. The top 40 is dominated by regions in Denmark, Germany, the Netherlands, Sweden, and Switzerland. The best performing region is *Noord-Brabant* (NL41) in the Netherlands due to the presence of several large R&D-intensive multinationals. France and Italy are the only countries having regions in both the high and low performers group.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	2.1	1	2	NL	10.9	3	9
BG	2.7	0	6	AT	1.7	2	1
CZ	2.3	0	8	PL	13.1	0	17
DK	2.5	4	1	PT	50.3	0	7
DE	8.8	25	13	RO	5.8	0	8
IE	1.0	0	3	SI	4.0	1	1
EL	17.5	0	13	SK	1.1	0	4
ES	--	0	19	FI	5.3	4	1
FR	22.9	3	11	SE	3.3	8	0
HR	1.1	0	4	NO	8.4	3	4
IT	10.2	1	20	CH	1.9	7	0
LT	1.0	0	2	RS	1.0	0	4
HU	3.4	0	8	UK	3.1	4	8

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

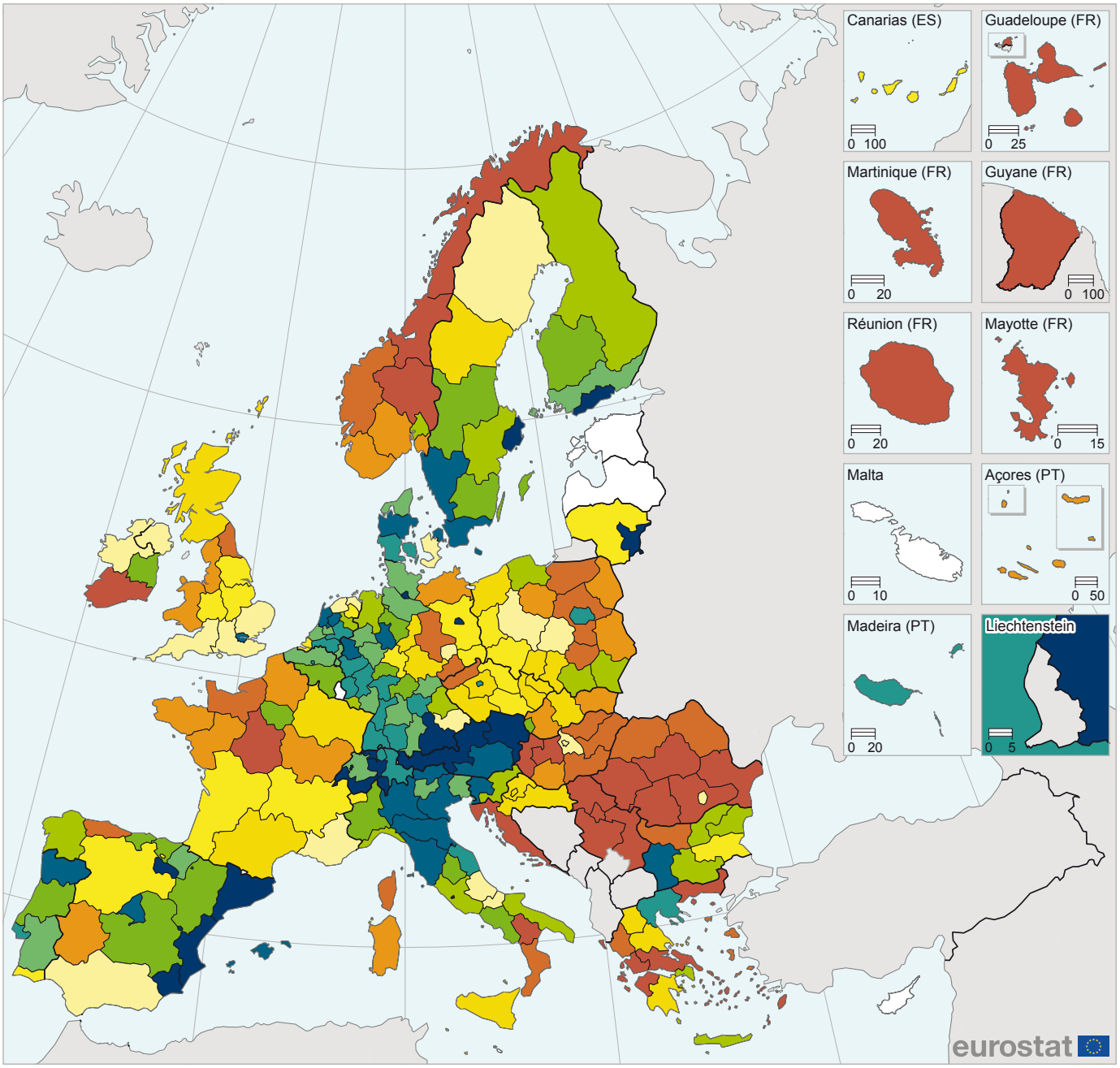
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Noord-Brabant (NL41)	161.4	17.30
2	Sydsverige (SE22)	161.4	13.85
3	Oberpfalz (DE23)	161.4	12.73
4	Stuttgart (DE11)	161.4	11.29
5	Oberbayern (DE21)	161.4	10.73
6	Mittelfranken (DE25)	161.4	10.72
7	Stockholm (SE11)	161.4	10.70
8	Rheinhessen-Pfalz (DEB3)	161.4	9.94
9	Helsinki-Uusimaa (FI1B)	161.4	9.41
10	Nordwestschweiz (CH03)	161.4	9.31
11	Tübingen (DE14)	161.4	9.26
12	Östra Mellansverige (SE12)	161.4	9.11
13	Västsverige (SE23)	158.5	8.59
14	Länsi-Suomi (FI19)	157.4	8.47
15	Karlsruhe (DE12)	152.6	7.96
16	Oberfranken (DE24)	150.1	7.70
17	Trøndelag (NO06)	149.1	7.59
18	Freiburg (DE13)	148.7	7.56
19	Unterfranken (DE26)	147.3	7.41
20	Région lémanique (CH01)	145.8	7.26
21	Hovedstaden (DK01)	143.7	7.06
22	Schwaben (DE27)	141.8	6.88
23	Zürich (CH04)	141.1	6.81
24	Agder og Rogaland (NO04)	139.5	6.65
25	Limburg (NL42)	138.0	6.51
26	Midtjylland (DK04)	137.6	6.47
27	Hannover (DE92)	137.1	6.42
28	Auvergne - Rhône-Alpes (FRK)	136.9	6.40
29	Ostschweiz (CH05)	135.2	6.24
30	Övre Norrland (SE33)	129.2	5.71
31	Zentralschweiz (CH06)	128.8	5.67
32	Detmold (DEA4)	128.6	5.65
33	Westösterreich (AT3)	128.0	5.60
34	Düsseldorf (DEA1)	127.7	5.57
35	Köln (DEA2)	127.2	5.53
36	Darmstadt (DE71)	126.1	5.44
37	Braunschweig (DE91)	125.4	5.37
38	Südösterreich (AT2)	125.2	5.36
39	Nordjylland (DK05)	125.2	5.36
40	Niederbayern (DE22)	125.2	5.36

Trademark applications per billion regional GDP



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Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Trademark applications per billion regional GDP

The overall performance on trademark applications is widely spread across Europe and within countries. Performance is relatively strong in several regions, particularly in urban and capital regions as seen in Austria, Belgium, Bulgaria, Czechia, Denmark, Finland, Germany, Italy, Lithuania, the Netherlands, Poland, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom. Overall, the average ratio between the best and worst performing regions is 9.9, with 72 regions performing above and 168 regions performing below the EU average.

Regional differences in Spain are high, with 6 regions in the high performers group and 4 regions in the low performers group. Also, Bulgaria, Czechia, Germany, Greece, Italy, Poland, Portugal, Spain and the United Kingdom, have regions in the high and low performers group, showing there are significant regional performance differences within countries.

The top 40 best performing regions are shown on the right. In total 15 countries are represented in the top 40, including 6 regions each from Italy and Spain, 5 from Germany, and 4 from Switzerland.

Zentralschweiz (CH06) and *Ticino* (CH07) are the two best performing regions. Noteworthy are the high rank positions for several regions in Eastern Europe including *Sostinės regionas* (LT01), *Zahodna Slovenija* (SI04), *Yugozapaden* (BG41), and *Warszawski stoleczny* (PL91).

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.3	1	2	NL	2.8	6	6
BG	4.1	1	5	AT	1.3	3	0
CZ	3.6	1	7	PL	4.3	1	16
DK	2.4	4	1	PT	3.5	4	3
DE	6.4	21	17	RO	5.7	0	8
IE	3.2	0	3	SI	1.8	1	1
EL	5.3	1	12	SK	2.1	0	4
ES	9.0	7	12	FI	2.5	2	3
FR	167.3	0	14	SE	4.1	3	5
HR	1.6	0	4	NO	4.2	0	7
IT	5.6	7	14	CH	3.9	7	0
LT	3.2	1	1	RS	1.4	0	4
HU	3.0	0	8	UK	4.7	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

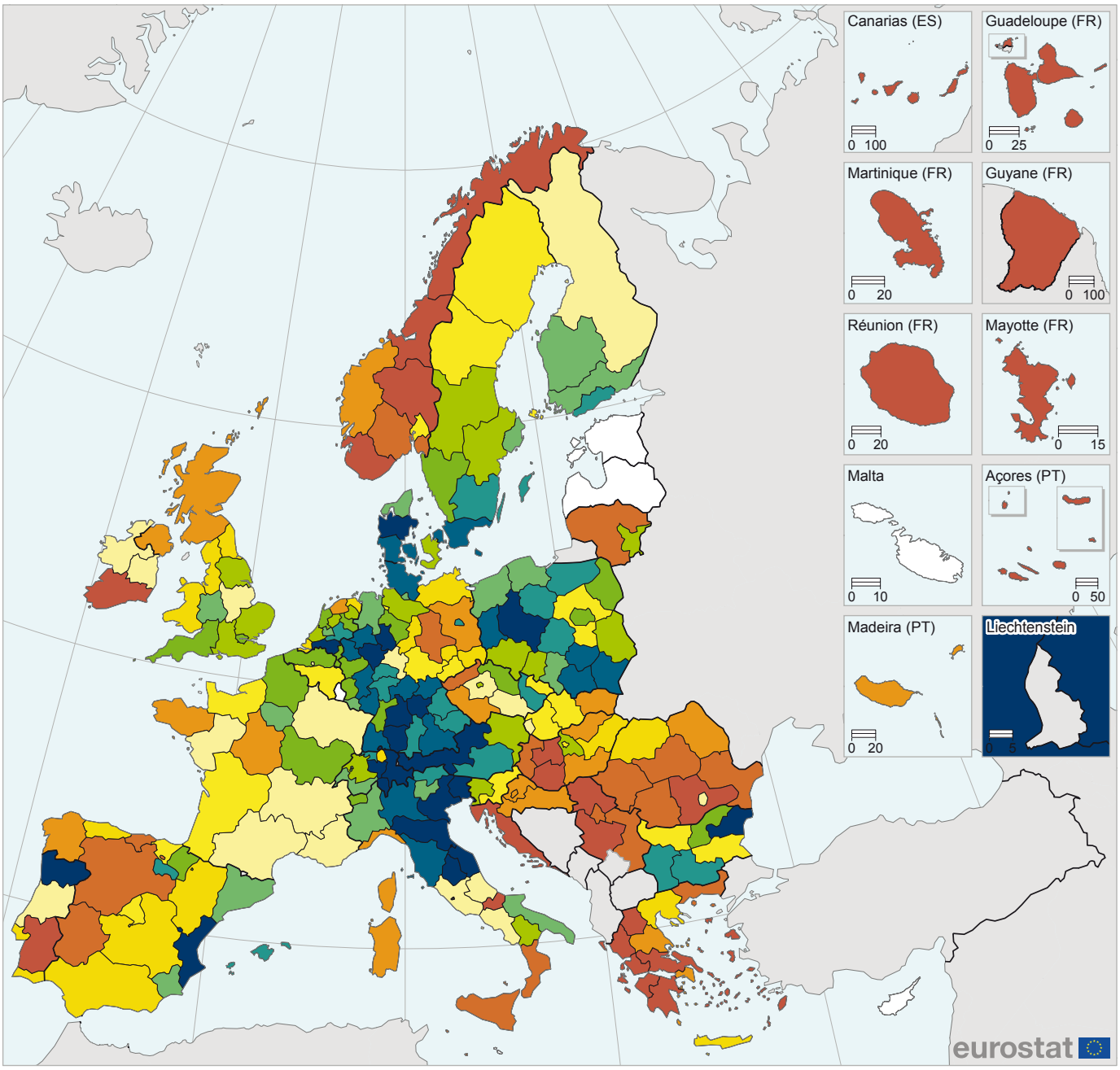
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Zentralschweiz (CH06)	219.1	24.1
2	Ticino (CH07)	219.1	19.4
3	Stockholm (SE11)	209.5	13.0
4	Helsinki-Uusimaa (FI1B)	203.0	12.6
5	Berlin (DE3)	194.1	12.0
6	Comunitat Valenciana (ES52)	192.6	11.9
7	Nordwestschweiz (CH03)	182.7	11.3
8	La Rioja (ES23)	181.1	11.2
9	Hamburg (DE6)	178.4	11.0
10	Sostines regionas (LT01)	173.4	10.7
11	Ostösterreich (AT1)	172.3	10.7
12	Westösterreich (AT3)	172.3	10.7
13	Cataluña (ES51)	170.6	10.6
14	Région lémanique (CH01)	170.5	10.6
15	Región de Murcia (ES62)	165.4	10.2
16	Oberbayern (DE21)	165.0	10.2
17	Hovedstaden (DK01)	162.3	10.1
18	Sydsverige (SE22)	158.8	9.8
19	Noord-Holland (NL32)	158.0	9.8
20	Veneto (ITH3)	155.5	9.6
21	Illes Balears (ES53)	153.3	9.5
22	Flevoland (NL23)	150.6	9.3
23	Lombardia (ITC4)	145.1	9.0
24	Zahodna Slovenija (SI04)	142.6	8.8
25	Emilia-Romagna (ITH5)	141.9	8.8
26	Detmold (DEA4)	140.8	8.7
27	London (UKI)	139.8	8.7
28	Norte (PT11)	139.7	8.7
29	Comunidad de Madrid (ES3)	139.2	8.6
30	Västsverige (SE23)	138.5	8.6
31	Midtjylland (DK04)	137.7	8.5
32	Provincia Autonoma Bolzano/Bozen (ITH1)	135.3	8.4
33	Südösterreich (AT2)	135.2	8.4
34	Toscana (ITI1)	132.2	8.2
35	Yugozapaden (BG41)	131.5	8.2
36	Düsseldorf (DEA1)	129.7	8.0
37	Warszawski stoleczny (PL91)	128.3	8.0
38	Noord-Brabant (NL41)	125.9	7.8
39	Região Autónoma da Madeira (PT3)	125.6	7.8
40	Marche (ITI3)	125.2	7.8

Design applications per billion regional GDP



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- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Design applications per billion regional GDP

Performance on design applications is widely spread across Europe and within countries. Overall, there are 63 regions performing above the EU average and 177 below the EU average, with the average ratio between the best and worst performing region above 15, and even close to 100 for Italy.

At least two high performing regions are found in Austria, Bulgaria, Denmark, Germany, Italy, the Netherlands, Poland, Spain, Sweden and Switzerland. Most strong performing regions are found in Germany, Italy, the Netherlands, Poland, Sweden and the United Kingdom. Most moderate performing regions are found in France, Germany, Spain and the United Kingdom, Most low performing regions are found in Greece, Hungary, Italy, Norway, Romania and Spain.

Large differences within countries are observed in Czechia, Germany, Italy, the Netherlands, Portugal, and Spain, which all have at least one region in the high performing group and one region in the low performing group.

The top 40 best performing regions are shown on the right. Germany is well represented in the top 40 with 14 regions as well as Italy with 7 and Poland with 6. Overall, *Ostschweiz* (CH05) is the best performing region, followed by *Umbria* (IT12) and *Detmold* (DEA4).

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	2.2	0	3	NL	17.9	2	10
BG	8.4	3	3	AT	4.2	2	1
CZ	7.8	1	7	PL	6.8	9	8
DK	5.1	4	1	PT	27.1	1	6
DE	24.7	21	17	RO	9.8	0	8
IE	7.0	0	3	SI	1.9	0	2
EL	--	0	13	SK	2.5	0	4
ES	--	3	16	FI	3.3	2	3
FR	--	1	13	SE	4.8	2	6
HR	1.9	0	4	NO	53.4	0	7
IT	98.3	8	13	CH	25.7	4	3
LT	5.9	0	2	RS	--	0	4
HU	10.4	0	8	UK	4.8	0	12

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

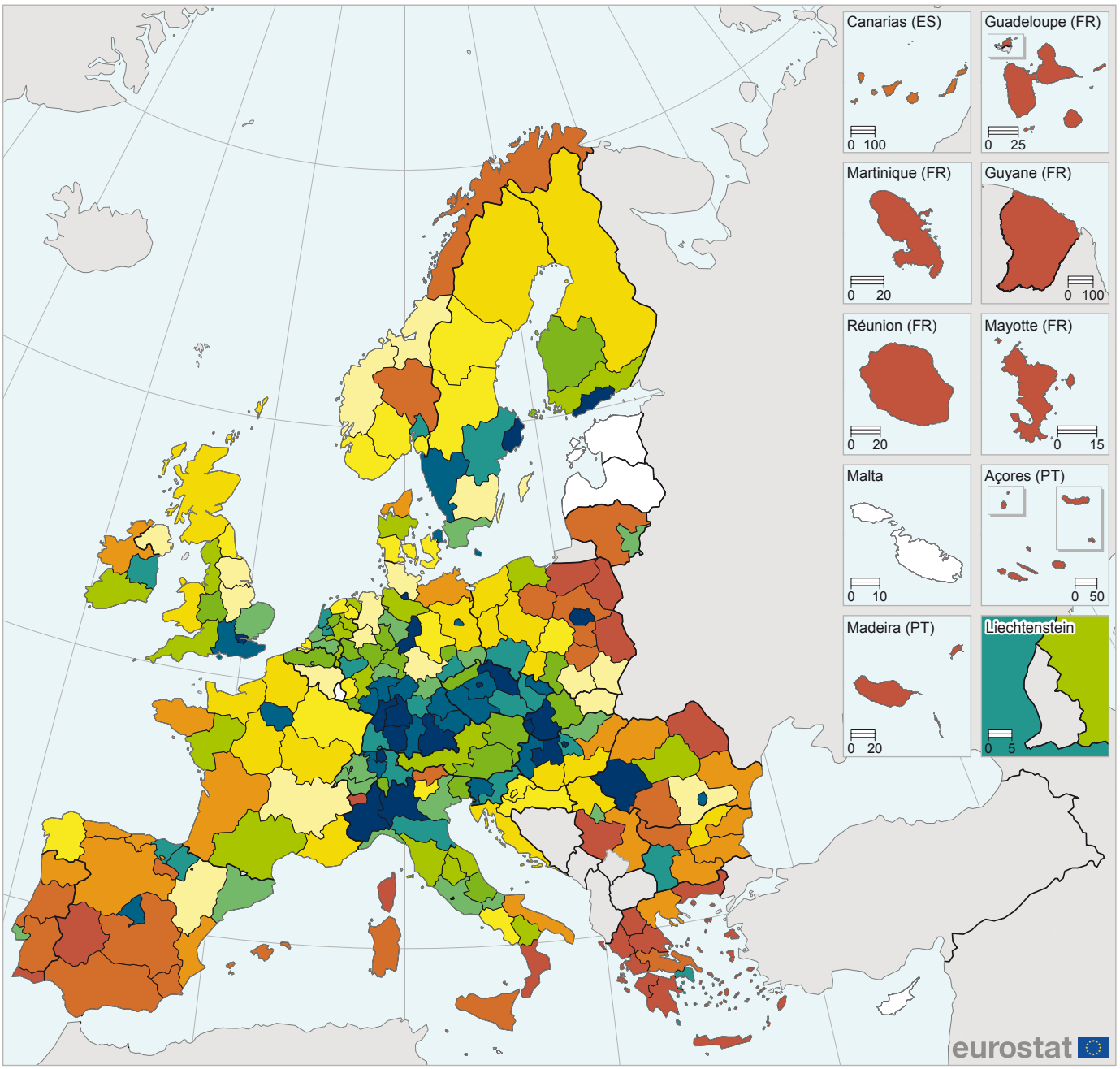
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Ostschweiz (CH05)	174.3	23.64
2	Umbria (ITI2)	174.3	22.73
3	Detmold (DEA4)	174.3	14.64
4	Marche (ITI3)	174.3	13.23
5	Midtjylland (DK04)	174.3	12.77
6	Severoiztochen (BG33)	174.3	12.71
7	Zentralschweiz (CH06)	174.3	12.49
8	Mittelfranken (DE25)	174.3	12.14
9	Veneto (ITH3)	171.4	11.70
10	Arnsberg (DEA5)	170.0	11.51
11	Noord-Brabant (NL41)	167.9	11.23
12	Friuli-Venezia Giulia (ITH4)	167.6	11.18
13	Westösterreich (AT3)	164.6	10.79
14	Emilia-Romagna (ITH5)	163.8	10.69
15	Stuttgart (DE11)	151.9	9.19
16	Wielkopolskie (PL41)	151.0	9.08
17	Comunitat Valenciana (ES52)	150.3	9.00
18	Ticino (CH07)	148.0	8.73
19	Tübingen (DE14)	145.4	8.42
20	Norte (PT11)	144.6	8.32
21	Malopolskie (PL21)	142.4	8.07
22	Freiburg (DE13)	140.9	7.90
23	Oberbayern (DE21)	139.4	7.74
24	Münster (DEA3)	133.1	7.06
25	Swietokrzyskie (PL72)	132.3	6.97
26	Syddanmark (DK03)	132.1	6.95
27	Oberfranken (DE24)	131.8	6.91
28	Hovedstaden (DK01)	128.2	6.54
29	Lubuskie (PL43)	127.3	6.45
30	Sydsverige (SE22)	125.4	6.26
31	Lombardia (ITC4)	124.8	6.20
32	Toscana (ITI1)	124.1	6.14
33	Schleswig-Holstein (DEF)	123.1	6.04
34	Unterfranken (DE26)	123.0	6.03
35	Koblenz (DEB1)	122.2	5.95
36	Düsseldorf (DEA1)	122.1	5.94
37	Rheinhessen-Pfalz (DEB3)	121.3	5.86
38	Podkarpackie (PL82)	120.7	5.81
39	Småland med öarna (SE21)	119.6	5.70
40	Warminsko-Mazurskie (PL62)	119.2	5.66

Employment in knowledge-intensive activities as percentage of total employment



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Cartography: Eurostat — GISCO, 05/2021

- Bottom low performers
- Middle low performers
- Top low performers
- Bottom moderate performers
- Middle moderate performers
- Top moderate performers
- Data not available
- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Employment in knowledge-intensive activities as percentage of total employment

Performance on employment in knowledge-intensive activities is widely spread across Europe and within countries. The best performing regions are located in Central and Northwest Europe. High shares of high performing regions are observed in Czechia, Germany, Hungary, Slovakia, Slovenia, and Switzerland.

The average score between the best and worst performing region is 2.5, with 97 regions performing above and 143 regions below the EU average. Relatively large performance differences within countries are observed in Greece, Portugal, and Romania.

Large differences within countries are observed in Bulgaria, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Norway, Poland, Romania and Spain, which all have at least one region in the high performing group and one region in the low performing group.

The top 40 best performing regions are shown on the right. *Stuttgart* (DE11), *Stockholm* (SE11) and *Vest* (RO42) are the three best performing regions. Germany is well represented in the top 40 with 13 regions. Several Eastern European countries are well represented in the top 40, with 5 regions from Czechia, 3 from Hungary, 2 from Romania and Slovakia and 1 region each from Poland and Slovenia.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.2	2	1	NL	1.5	5	7
BG	2.2	1	5	AT	1.0	2	1
CZ	1.6	7	1	PL	3.5	3	14
DK	1.9	1	4	PT	4.5	1	6
DE	2.5	27	11	RO	6.0	2	6
IE	1.7	1	2	SI	1.1	2	0
EL	5.5	1	12	SK	1.7	3	1
ES	3.8	4	15	FI	2.1	2	3
FR	3.3	1	13	SE	2.2	4	4
HR	1.1	0	4	NO	2.3	1	6
IT	3.9	9	12	CH	1.5	7	0
LT	2.0	1	1	RS	2.6	1	3
HU	2.1	5	3	UK	2.0	4	8

Definition of the indicator

Numerator: Number of employed persons in knowledge-intensive activities in business industries

Denominator: Total employment

Rationale: Knowledge-intensive activities provide services to consumers, such as telecommunications, and provide inputs to the innovative activities of other firms in all sectors of the economy. As regional data are not available, data on employment in medium-high and high-tech manufacturing and knowledge-intensive services have been used

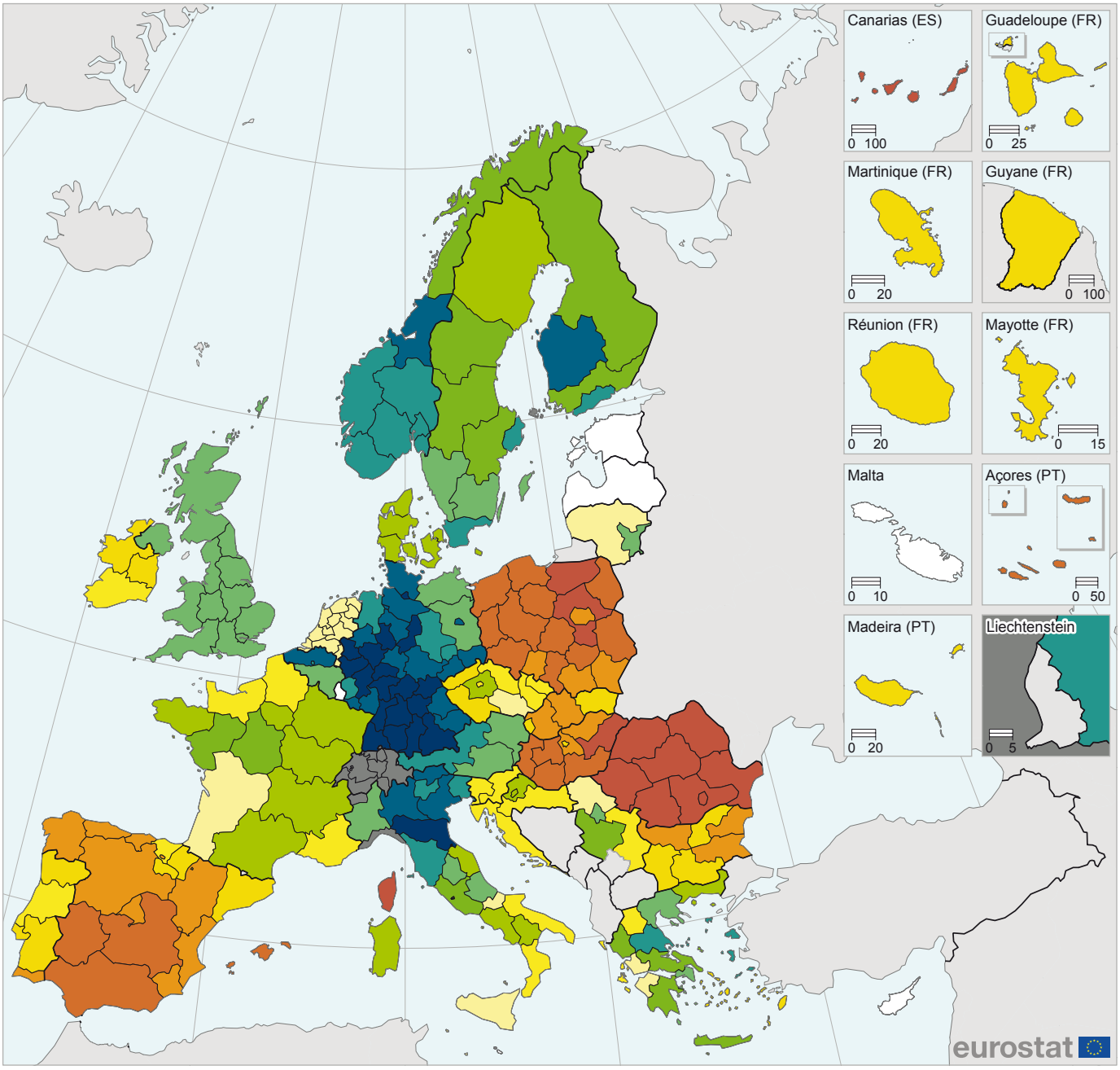
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Stuttgart (DE11)	167.9	27.5
2	Stockholm (SE11)	167.9	26.3
3	Vest (RO42)	167.9	26.0
4	Oberbayern (DE21)	167.9	25.2
5	Tübingen (DE14)	167.9	24.9
6	Braunschweig (DE91)	167.9	24.4
7	Praha (CZ01)	167.9	24.2
8	Zürich (CH04)	167.9	23.7
9	Helsinki-Uusimaa (FI1B)	166.7	23.4
10	Bratislavský kraj (SK01)	160.8	22.7
11	Budapest (HU11)	160.0	22.6
12	Karlsruhe (DE12)	160.0	22.6
13	London (UKI)	160.0	22.6
14	Západné Slovensko (SK02)	159.1	22.5
15	Severovýchod (CZ05)	158.3	22.4
16	Warszawski stoleczny (PL91)	157.4	22.3
17	Közép-Dunántúl (HU21)	155.7	22.1
18	Hamburg (DE6)	154.0	21.9
19	Piemonte (ITC1)	152.4	21.7
20	Lombardia (ITC4)	149.8	21.4
21	Nyugat-Dunántúl (HU22)	148.1	21.2
22	Bucuresti - Ilfov (RO32)	147.3	21.1
23	Niederbayern (DE22)	146.4	21.0
24	Unterfranken (DE26)	145.6	20.9
25	Västsverige (SE23)	145.6	20.9
26	Darmstadt (DE71)	143.9	20.7
27	Schwaben (DE27)	143.1	20.6
28	Nordwestschweiz (CH03)	143.1	20.6
29	Oberpfalz (DE23)	142.2	20.5
30	Île de France (FR1)	141.4	20.4
31	Rheinhessen-Pfalz (DEB3)	141.4	20.4
32	South East (UKJ)	140.5	20.3
33	Berlin (DE3)	138.8	20.1
34	Hovedstaden (DK01)	138.0	20.0
35	Jihozápad (CZ03)	137.2	19.9
36	Střední Cechy (CZ02)	137.2	19.9
37	Zahodna Slovenija (SI04)	135.5	19.7
38	Zentralschweiz (CH06)	134.6	19.6
39	Comunidad de Madrid (ES3)	133.8	19.5
40	Moravskoslezsko (CZ08)	132.9	19.4

Employment in innovative SMEs as percentage of total employment



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Cartography: Eurostat — GISCO, 05/2021

- Bottom low performers
- Middle low performers
- Top low performers
- Bottom moderate performers
- Middle moderate performers
- Top moderate performers
- Data not available
- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

Data not available for 12 regions including Ciudad de Ceuta (ES63), Ciudad de Melilla (ES64), Åland (FI2), Valle d'Aosta/Vallée d'Aoste (ITC2), Liguria (ITC3), and all Swiss regions.

Employment in innovative SMEs as percentage of total employment

Regional performance on employment in innovation-active enterprises shows variation across countries but to a lesser extent within countries. On average, the best performing region performs just 1.4 times higher than the worst performing region. The highest variation across regions within countries is observed in Romania and France.

High shares of high performing regions are observed in only a few countries including Belgium, Germany (36 out of 38 regions), and Norway. High shares of strong performers are observed in Austria, Denmark (all regions), France, Greece, Sweden, and the United Kingdom (all regions). High shares of moderate performers are observed in Czechia, Ireland (all regions), the Netherlands (all regions as regional CIS data are not available), Portugal, and Slovenia (all regions). High shares of low performers are observed in Hungary, Poland (all regions), Romania (all regions), and Spain.

Performance differences within countries are relatively small. There is not a single country with both high and low performing regions.

The top 40 best performing regions is dominated by German regions with 33 in total and the first 18 regions are all from Germany. The best performing region is *Karlsruhe* (DE12). *Stuttgart* (DE11) and *Oberbayern* (DE21) rank second and third. Just 5 countries are represented in the top 40 with, next to Germany, 4 regions in Italy and one region each in Belgium, Finland and Sweden.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.1	3	0	NL	--	--	--
BG	1.3	0	6	AT	1.1	3	0
CZ	1.3	1	7	PL	1.5	0	17
DK	--	--	--	PT	1.6	0	7
DE	1.1	38	0	RO	3.8	0	8
IE	1.3	0	3	SI	--	--	--
EL	1.6	10	3	SK	1.1	0	4
ES	2.0	0	17	FI	1.1	4	0
FR	3.0	8	6	SE	1.2	8	0
HR	1.2	2	2	NO	1.0	7	0
IT	1.4	16	3	CH	--	--	--
LT	1.2	1	1	RS	1.3	2	2
HU	1.7	0	8	UK	--	--	--

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

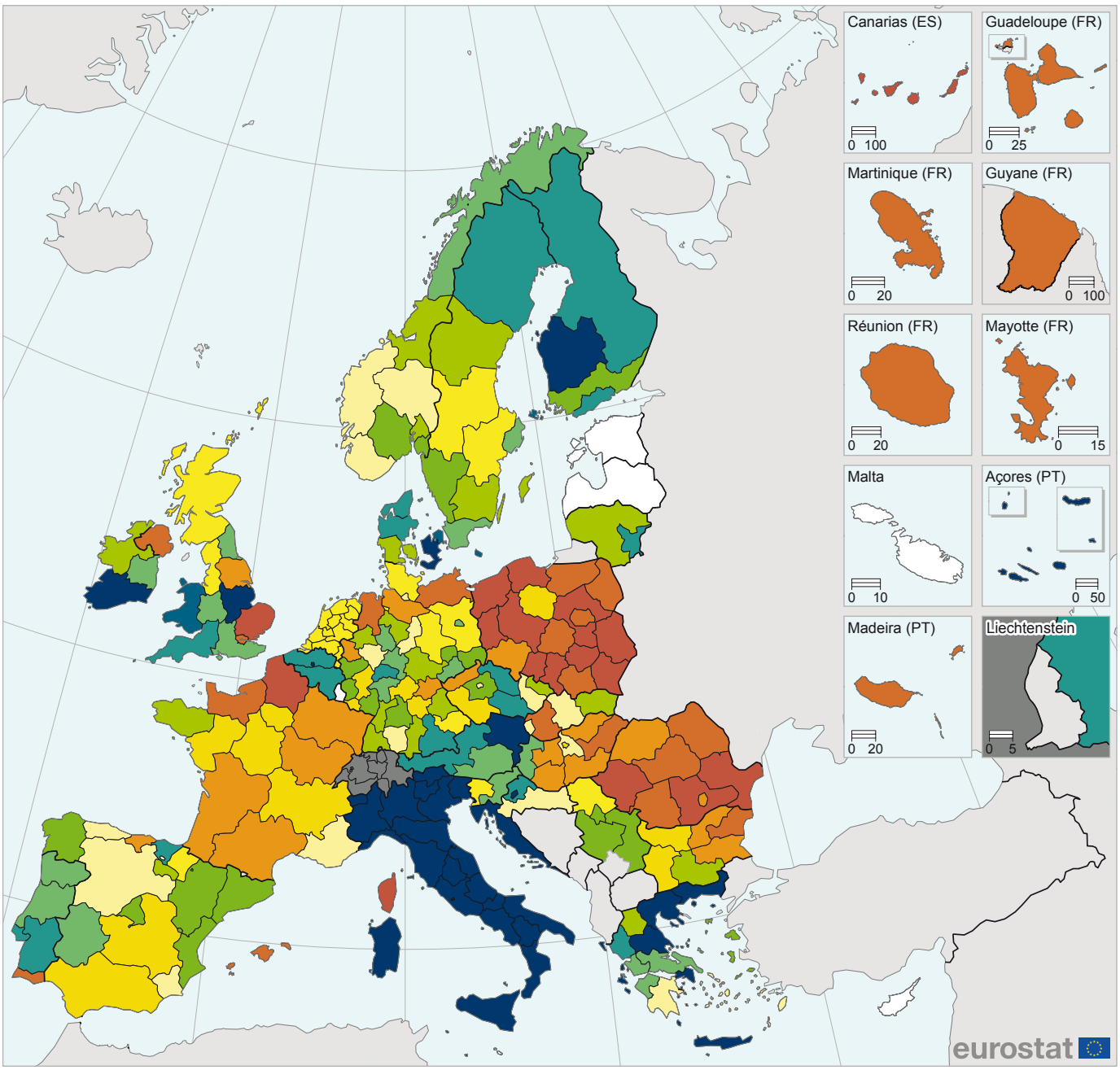
Top 40 regions

*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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Karlsruhe (DE12)	162.9	78.5
2	Stuttgart (DE11)	161.4	78.0
3	Oberbayern (DE21)	161.2	77.9
4	Freiburg (DE13)	161.1	77.9
5	Tübingen (DE14)	158.6	77.0
6	Darmstadt (DE71)	157.8	76.7
7	Detmold (DEA4)	157.6	76.7
8	Braunschweig (DE91)	157.6	76.7
9	Köln (DEA2)	157.2	76.5
10	Arnsberg (DEA5)	157.1	76.5
11	Gießen (DE72)	156.9	76.4
12	Hamburg (DE6)	155.9	76.1
13	Koblenz (DEB1)	155.3	75.9
14	Oberfranken (DE24)	154.7	75.7
15	Mittelfranken (DE25)	154.0	75.4
16	Unterfranken (DE26)	153.7	75.3
17	Schwaben (DE27)	153.1	75.1
18	Düsseldorf (DEA1)	152.9	75.1
19	Emilia-Romagna (ITH5)	152.6	75.0
20	Kassel (DE73)	152.4	74.9
21	Hannover (DE92)	152.0	74.7
22	Veneto (ITH3)	151.9	74.7
23	Rheinhessen-Pfalz (DEB3)	151.7	74.7
24	Vlaams Gewest (BE2)	151.7	74.7
25	Berlin (DE3)	151.7	74.6
26	Saarland (DEC)	151.4	74.5
27	Niederbayern (DE22)	150.5	74.2
28	Thüringen (DEG)	150.3	74.2
29	Länsi-Suomi (FI19)	150.0	74.0
30	Dresden (DED2)	149.4	73.9
31	Lüneburg (DE93)	148.8	73.7
32	Bremen (DE5)	148.6	73.6
33	Chemnitz (DED4)	148.3	73.5
34	Münster (DEA3)	147.9	73.3
35	Provincia Autonoma Bolzano/Bozen (ITH1)	147.4	73.2
36	Oberpfalz (DE23)	146.5	72.9
37	Schleswig-Holstein (DEF)	145.5	72.5
38	Lombardia (ITC4)	145.3	72.5
39	Sydsverige (SE22)	145.2	72.4
40	Weser-Ems (DE94)	144.8	72.3

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



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Cartography: Eurostat — GISCO, 05/2021

- Bottom low performers
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- Top moderate performers
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- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016 *No data for all Swiss regions.*
Source: European Commission – Regional Innovation Scoreboard 2021

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

Performance on Sales of new-to-market and new-to-enterprise innovations in SMEs as percentage of turnover is widely spread across Europe and within countries.

On average, the best performing region performs 3.6 times higher than the worst performing region. The highest variation across regions within countries is observed in France, Spain, and the United Kingdom.

High shares (50% or above) of high performers are found in Belgium,, Croatia, Denmark, Finland, Greece, and Italy. High shares of strong performers are found in Ireland, Norway, Serbia and Sweden. High shares of moderate performers are found in the Netherlands and high shares of low performers in France, Hungary, Poland and Romania.

Large differences within countries are observed in Czechia, Germany, Portugal, Spain and the United Kingdom, which all have at least one region in the high performing group and one region in the low performing group.

The top 40 best performing regions are shown on the right. Regional data for Italy are not available for this indicator, therefore for all regions the same national Italian performance score has been used. Italy scores well above average which explains why 21 regions are included in the top 40. Greece is also well represented with 6 regions. The best performing region is *Região Autónoma dos Açores* (PT2) and second *Ionia Nisia* (EL62) with both performance of close to 60% above the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.5	3	0	NL	--	--	--
BG	2.3	0	6	AT	1.8	3	0
CZ	2.6	2	6	PL	3.9	0	17
DK	2.2	4	1	PT	7.3	5	2
DE	3.4	10	28	RO	2.6	0	8
IE	2.2	2	1	SI	1.6	1	1
EL	3.4	10	3	SK	2.4	0	4
ES	16.3	3	16	FI	2.1	4	1
FR	9.4	0	14	SE	1.8	4	4
HR	2.2	3	1	NO	2.1	1	6
IT	--	--	--	CH	--	0	0
LT	1.3	1	1	RS	1.5	2	2
HU	2.5	1	7	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)

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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Região Autónoma dos Açores (PT2)	157.9	23.04
2	Ionia Nisia (EL62)	157.9	21.05
3	Kriti (EL43)	152.8	16.93
4	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1)	152.3	16.84
5	Sjælland (DK02)	150.4	16.46
6	Kentriki Makedonia (EL52)	149.7	16.30
7	Länsi-Suomi (FI19)	148.8	16.13
8	Ostösterreich (AT1)	146.0	15.58
9	Attiki (EL3)	145.2	15.41
10	Thessalia (EL61)	144.7	15.32
11	Southern (IE05)	144.7	15.32
12	Jadranska Hrvatska (HR03)	143.0	14.99
13	Grad Zagreb (HR05)	134.9	13.48
14	East Midlands (UKF)	128.5	12.35
15	Anatoliki Makedonia, Thraki (EL51)	127.8	12.22
16	Italy – all 21 regions	127.7	12.20
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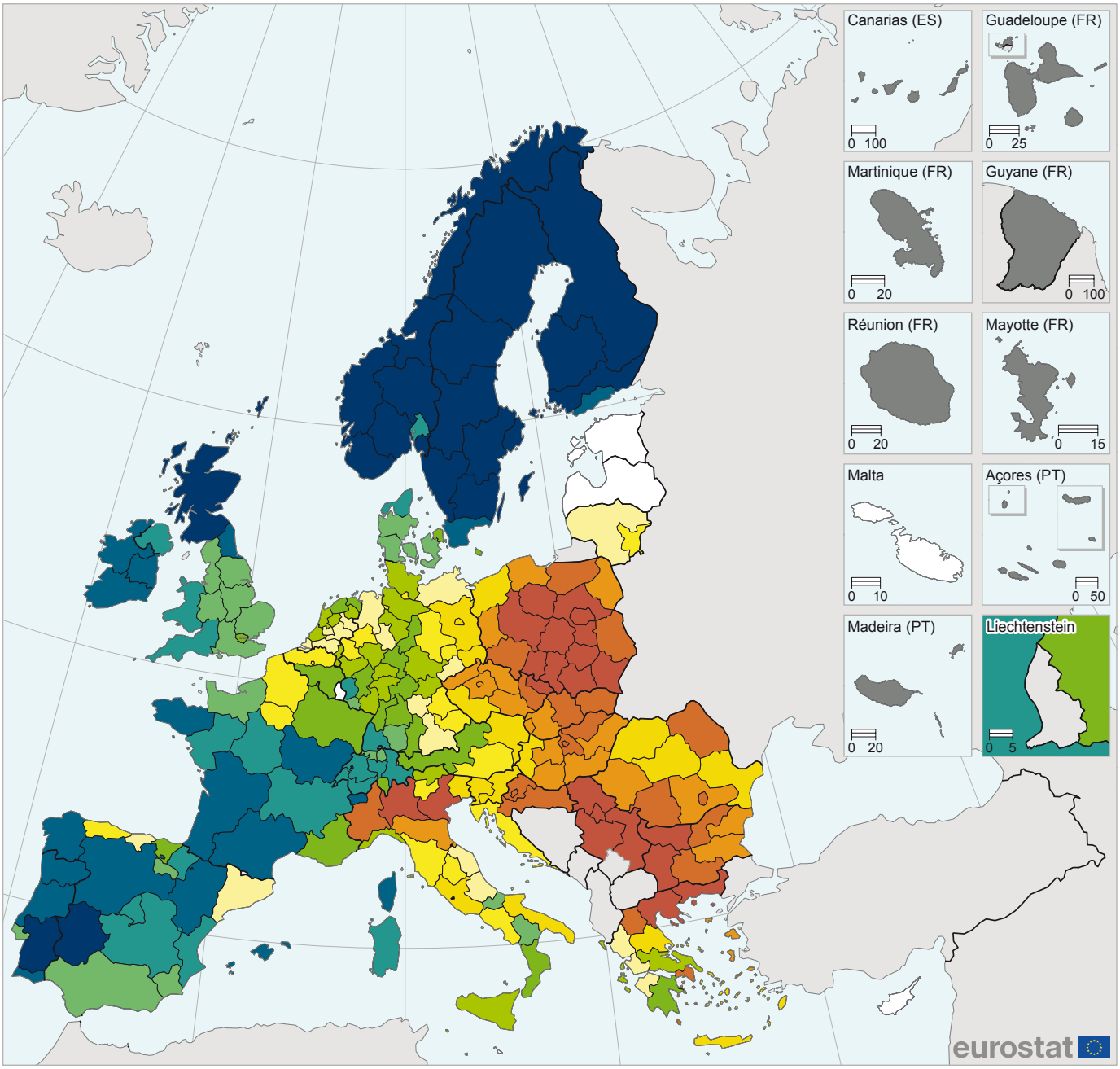
37	Hovedstaden (DK01)	126.9	12.07
38	Åland (FI2)	126.3	11.97
39	Wales (UKL)	125.8	11.89
40	Helsinki-Uusimaa (FI1B)	125.4	11.82

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



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Cartography: Eurostat — GISCO, 05/2021

- Bottom low performers
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- Top moderate performers
- Data not available
- Bottom strong performers
- Middle strong performers
- Top strong performers
- Bottom high performers
- Middle high performers
- Top high performers

Note: All regions NUTS 2021, except Norwegian regions NUTS 2016
Source: European Commission – Regional Innovation Scoreboard 2021

No data for 4 regions including Canarias (ES7), Régions ultrapériphériques françaises (FRY), Região Autónoma dos Açores (PT2), and Região Autónoma da Madeira (PT3).

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

This is a new indicator in the RIS and captures average concentration levels of fine particulate matter (PM2.5: particles with a diameter of 2.5 micro¬metres or less) to which the population is exposed.

Performance is less spread within countries but more across countries. The average ratio of best to worst performing region is only 1.6, and in only five countries this ratio is above 2. High shares of high performing regions are observed in Finland, France, Ireland, Norway, Portugal and Sweden. High shares of strong performing regions are observed in Denmark, Germany, the Netherlands and the United Kingdom. High shares of moderate performing regions are observed in Austria, Belgium, Lithuania and Slovenia. High shares of low performing regions are observed in Bulgaria, Croatia, Czechia, Hungary, Romania, Serbia and Slovakia.

Only Italy has both high and low performing regions. In 9 countries regions belong to similar performance groups. In Finland, Ireland, Norway and Sweden all regions are high performers. In Lithuania and Slovenia all regions are moderate performers. In Bulgaria, Serbia and Slovakia all regions are low performers. Most of the regions in Eastern Europe belong to the low performing groups.

The top 40 best performing regions are shown on the right. All the regions in Ireland, Finland and Sweden are included in the top 40. The top-20 is dominated by Scandinavian regions with 7 regions from Sweden, 6 from Norway and 4 from Finland. The top 3 regions include two Swedish regions (*Mellersta Norrland* (SE32) and *Övre Norrland* (SE33)) and one Finnish region (*Åland* (FI2) all performing close to 100% above the EU average.

	Ratio best/ worst region	Above EU average	Below EU average		Ratio best/ worst region	Above EU average	Below EU average
BE	1.2	0	3	NL	1.1	0	12
BG	1.5	6	0	AT	1.3	1	2
CZ	1.8	8	0	PL	1.7	17	0
DK	1.2	0	5	PT	1.7	0	5
DE	1.6	3	35	RO	1.3	8	0
IE	1.2	0	3	SI	1.0	2	0
EL	2.6	8	5	SK	1.1	4	0
ES	2.3	1	17	FI	1.9	0	5
FR	1.6	0	13	SE	2.3	0	8
HR	1.5	3	1	NO	2.3	0	7
IT	2.3	7	14	CH	1.2	0	7
LT	1.0	0	2	RS	1.2	4	0
HU	1.2	8	0	UK	1.7	0	12

Definition of the alternative indicator

Regional data are not available for this indicator. Instead, regional data have been made available by the European Environmental Agency (EEA) on Exposure to air emissions (PM2.5). An interactive map at NUTS 3 level is available at: https://eea.maps.arcgis.com/apps/InteractiveLegend/index.html?appid=f008e0dc0ce24edfae5463748de10f27

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 data values in the last column before normalising the data.

	Region	Relative to EU score	Indicator value
1	Mellersta Norrland (SE32)	197.4	3.8
2	Övre Norrland (SE33)	197.4	3.8
3	Åland (FI2)	194.4	4.1
4	Nord-Norge (NO07)	192.5	4.3
5	Norra Mellansverige (SE31)	191.5	4.4
6	Innlandet (NO02)	189.9	4.6
7	Pohjois-ja Itä-Suomi (FI1D)	189.1	4.6
8	Vestlandet (NO05)	188.9	4.7
9	Länsi-Suomi (FI19)	185.0	5.1
10	Östra Mellansverige (SE12)	184.3	5.1
11	Trøndelag (NO06)	184.0	5.2
12	Stockholm (SE11)	178.7	5.7
13	Etelä-Suomi (FI1C)	174.1	6.2
14	Extremadura (ES43)	173.7	6.2
15	Agder og Rogaland (NO04)	172.9	6.3
16	Scotland (UKM)	171.1	6.5
17	Sør-Østlandet (NO03)	171.0	6.5
18	Alentejo (PT18)	170.9	6.5
19	Småland med öarna (SE21)	167.6	6.8
20	Västsverige (SE23)	166.7	6.9
21	Northern and Western (IE04)	165.0	7.1
22	Algarve (PT15)	165.0	7.1
23	Centro (PT16)	164.2	7.2
24	Southern (IE05)	160.5	7.6
25	Helsinki-Uusimaa (FI1B)	160.1	7.6
26	Castilla y León (ES41)	159.8	7.6
27	Norte (PT11)	156.9	7.9
28	Eastern and Midland (IE06)	154.2	8.2
29	Occitanie (FRJ)	152.1	8.4
30	Corse (FRM)	151.8	8.4
31	Nouvelle-Aquitaine (FRI)	150.1	8.6
32	Aragón (ES24)	147.8	8.8
33	Bourgogne - Franche-Comté (FRC)	147.8	8.9
34	Sydsverige (SE22)	147.4	8.9
35	Illes Balears (ES53)	147.1	8.9
36	Valle d'Aosta/Vallée d'Aoste (ITC2)	146.3	9.0
37	Bretagne (FRH)	146.2	9.0
38	North East (UKC)	145.8	9.1
39	Galicia (ES11)	145.6	9.1
40	Northern Ireland (UKN)	145.4	9.1

5. RIS methodology

5.1 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.

5.2 Composite indicators

5.2.1 Normalising data

For the calculation of composite indicators, the individual indicators should ideally follow a normal distribution, but 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: International scientific co-publications, Non-R&D innovation expenditures, Innovation expenditures per person employed, Public-private co-publications, PCT patent applications, Design applications, and Sales of new-to-market and new-to-enterprise innovations.

Following this transformation, the data are normalised using the min-max procedure. The minimum score 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.

5.2.2 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 for calculating the Regional Innovation Index:

1. Calculate the ratios of the EIS 2021 innovation index at country level with that of the EU: EIS_index_CTR / EIS_index_EU

2. Calculate the ratios of the RIS 2021 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)

4. 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 2014, the first year of the 8-years for which data are used in the RIS.

5.3 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 above 125% of the EU average in 2021; Strong Innovators are all regions with a relative performance between 100% and 125% of the EU average in 2021; Moderate Innovators are all regions with a relative performance between 70% and 100% of the EU average in 2021; Catching-up Innovators are all regions with a relative performance below 70% of the EU average in 2021.

Annex 1: RIS 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 30 to 34 and will relatively quickly reflect changes in educational policies leading to more tertiary graduates
Included in EIS	Yes
Data source	Eurostat, regional statistics
Data availability	NUTS 2: 2012 - 2019

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: 2012 - 2019

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: 2013 - 2020

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: 2011 - 2018

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	Own estimates combining EIS country level with regional data (Eurostat) on Households with broadband access
Data source	Eurostat
Data availability	NUTS 2: 2015 - 2019

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: 2011 - 2018

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: 2011 - 2018

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	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 2012, CIS 2014, CIS 2016, CIS 2018

Innovation expenditures per person employed in innovative SMEs	
Numerator	Sum of total innovation expenditure by enterprises in all size classes in Purchasing Power Standards (PPS)
Denominator	Total employment in innovative enterprises SMEs
Rationale	The indicator measures the monetary input directly related to innovation activities.
Included in EIS	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 2012, CIS 2014, CIS 2016, CIS 2018

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	Own estimates combining EIS country level with regional data (Eurostat) on Employment in information and communication (NACE J)
Data source	Eurostat
Data availability	NUTS 1 and 2 for different countries for 2012 - 2019

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 markers 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 2012, CIS 2014, CIS 2016, CIS 2018

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 2012, CIS 2014, CIS 2016, CIS 2018

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 2012, CIS 2014, CIS 2016, CIS 2018

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: 2013 - 2020

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 2012 - 2019

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 2012 - 2019

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	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 2012 - 2019

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	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: 2012 - 2019

Employment in innovative SMEs	
Numerator	Number of employed persons in innovative SMEs
Denominator	Total employment in innovative SMEs
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 Own estimates for 2012, 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	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 2012, CIS 2014, CIS 2016, CIS 2018

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/m^3 for fine particulate matter in Directive 2008/50/EC1[11] 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/m^3 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	Alternative data used for Exposure to fine particulates (PM 2.5)
Data source	European Environmental Agency
Data availability	NUTS 2: 2014 - 2018

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

Annex 2: Regional innovation performance groups

		2021 relative to EU in 2014	2021 relative to EU in 2021	Change over time compared to EU in 2014	Performance subgroup
EU27	EU27	114.8	100.0	14.8	
BE	Belgium				
BE1	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest	155.2	135.1	24.9	Innovation leader
BE2	Vlaams Gewest	149.8	130.5	21.0	Innovation leader -
BE3	Région Wallonne	130.9	114.0	20.2	Strong innovator
BG	Bulgaria				
BG31	Severozapaden	29.9	26.0	4.7	Emerging innovator -
BG32	Severen tsentralen	40.1	34.9	2.1	Emerging innovator
BG33	Severoiztochen	40.8	35.5	8.4	Emerging innovator
BG34	Yugoiztochen	31.2	27.2	0.7	Emerging innovator -
BG41	Yugozapaden	63.8	55.6	11.4	Emerging innovator +
BG42	Yuzhen tsentralen	41.0	35.7	6.2	Emerging innovator
CZ	Czech Republic				
CZ01	Praha	123.5	107.5	15.9	Strong innovator -
CZ02	Střední Čechy	101.9	88.8	23.8	Moderate innovator
CZ03	Jihozápad	85.0	74.0	8.2	Moderate innovator -
CZ04	Severozápad	54.9	47.8	-5.4	Emerging innovator
CZ05	Severovýchod	91.2	79.4	6.9	Moderate innovator -
CZ06	Jihovýchod	101.8	88.6	11.9	Moderate innovator
CZ07	Střední Morava	84.6	73.6	3.7	Moderate innovator -
CZ08	Moravskoslezsko	85.9	74.8	20.0	Moderate innovator -
DK	Denmark				
DK01	Hovedstaden	171.1	149.0	-4.0	Innovation leader +
DK02	Sjælland	113.8	99.1	-14.4	Moderate innovator +
DK03	Syddanmark	125.2	109.0	-2.0	Strong innovator
DK04	Midtjylland	151.9	132.2	6.1	Innovation leader -
DK05	Nordjylland	134.3	116.9	5.3	Strong innovator +
DE	Germany				
DE11	Stuttgart	148.8	129.6	8.0	Innovation leader -
DE12	Karlsruhe	165.4	144.0	7.1	Innovation leader
DE13	Freiburg	144.7	126.0	6.5	Innovation leader -
DE14	Tübingen	154.7	134.7	9.1	Innovation leader -
DE21	Oberbayern	173.5	151.1	14.6	Innovation leader +
DE22	Niederbayern	112.8	98.2	6.5	Moderate innovator +
DE23	Oberpfalz	133.1	115.9	6.2	Strong innovator
DE24	Oberfranken	127.5	111.1	3.8	Strong innovator
DE25	Mittelfranken	147.5	128.5	8.8	Innovation leader -
DE26	Unterfranken	137.7	119.9	7.5	Strong innovator +
DE27	Schwaben	123.8	107.8	6.1	Strong innovator -
DE3	Berlin	165.2	143.8	16.1	Innovation leader
DE4	Brandenburg	110.1	95.9	-0.8	Moderate innovator +
DE5	Bremen	129.5	112.8	2.3	Strong innovator
DE6	Hamburg	153.1	133.3	12.4	Innovation leader -

		2021 relative to EU in 2014	2021 relative to EU in 2021	Change over time compared to EU in 2014	Performance subgroup
DE71	Darmstadt	147.2	128.2	8.2	Innovation leader -
DE72	Gießen	142.1	123.8	24.7	Strong innovator +
DE73	Kassel	113.4	98.8	1.4	Moderate innovator +
DE8	Mecklenburg-Vorpommern	107.5	93.6	2.4	Moderate innovator +
DE91	Braunschweig	154.6	134.6	17.2	Innovation leader -
DE92	Hannover	134.8	117.4	12.1	Strong innovator +
DE93	Lüneburg	104.7	91.1	-2.4	Moderate innovator +
DE94	Weser-Ems	98.8	86.1	3.3	Moderate innovator
DEA1	Düsseldorf	123.9	107.9	5.8	Strong innovator -
DEA2	Köln	148.9	129.7	11.4	Innovation leader -
DEA3	Münster	121.9	106.1	4.0	Strong innovator -
DEA4	Detmold	133.9	116.6	18.7	Strong innovator
DEA5	Arnsberg	126.5	110.2	10.2	Strong innovator
DEB1	Koblenz	112.7	98.2	12.1	Moderate innovator +
DEB2	Trier	115.4	100.5	-5.2	Strong innovator -
DEB3	Rheinhessen-Pfalz	153.7	133.8	15.0	Innovation leader -
DEC	Saarland	122.9	107.0	6.4	Strong innovator -
DED2	Dresden	141.9	123.6	6.2	Strong innovator +
DED4	Chemnitz	114.8	100.0	9.8	Strong innovator -
DED5	Leipzig	135.2	117.7	16.7	Strong innovator +
DEE	Sachsen-Anhalt	107.1	93.3	8.0	Moderate innovator +
DEF	Schleswig-Holstein	123.8	107.8	6.0	Strong innovator -
DEG	Thüringen	123.0	107.1	7.3	Strong innovator -
EE	Estonia				
IE	Ireland				
IE04	Northern and Western	111.1	96.7	3.8	Moderate innovator +
IE05	Southern	118.1	102.8	2.9	Strong innovator -
IE06	Eastern and Midland	131.9	114.9	3.3	Strong innovator
EL	Greece				
EL3	Attiki	99.7	86.9	27.3	Moderate innovator
EL41	Voreio Aigaio	72.8	63.4	26.2	Emerging innovator +
EL42	Notio Aigaio	54.7	47.6	15.6	Emerging innovator
EL43	Kriti	94.3	82.1	24.8	Moderate innovator
EL51	Anatoliki Makedonia, Thraki	64.7	56.4	22.8	Emerging innovator +
EL52	Kentriki Makedonia	89.4	77.8	30.0	Moderate innovator -
EL53	Dytiki Makedonia	56.8	49.5	12.2	Emerging innovator
EL54	Ipeiros	81.6	71.0	36.0	Moderate innovator -
EL61	Thessalia	85.4	74.4	30.8	Moderate innovator -
EL62	Ionia Nisia	69.1	60.2	35.6	Emerging innovator +
EL63	Dytiki Ellada	82.4	71.8	23.9	Moderate innovator -
EL64	Sterea Ellada	71.9	62.6	14.9	Emerging innovator +
EL65	Peloponnisos	67.8	59.0	22.2	Emerging innovator +
ES	Spain				
ES11	Galicia	90.7	78.9	16.0	Moderate innovator -
ES12	Principado de Asturias	84.6	73.7	8.9	Moderate innovator -
ES13	Cantabria	84.4	73.5	9.5	Moderate innovator -
ES21	País Vasco	119.0	103.6	14.7	Strong innovator -
ES22	Comunidad Foral de Navarra	112.6	98.1	17.5	Moderate innovator +
ES23	La Rioja	92.6	80.7	7.9	Moderate innovator

		2021 relative to EU in 2014	2021 relative to EU in 2021	Change over time compared to EU in 2014	Performance subgroup
ES24	Aragón	92.9	80.9	9.1	Moderate innovator
ES3	Comunidad de Madrid	116.0	101.0	13.7	Strong innovator -
ES41	Castilla y León	88.3	76.9	17.4	Moderate innovator -
ES42	Castilla-la Mancha	73.9	64.4	12.3	Emerging innovator +
ES43	Extremadura	70.2	61.1	14.1	Emerging innovator +
ES51	Cataluña	113.6	98.9	16.9	Moderate innovator +
ES52	Comunidad Valenciana	104.9	91.3	18.3	Moderate innovator +
ES53	Illes Balears	77.4	67.4	9.9	Emerging innovator +
ES61	Andalucía	77.6	67.5	10.6	Emerging innovator +
ES62	Región de Murcia	87.6	76.3	17.5	Moderate innovator -
ES63	Ciudad Autónoma de Ceuta	38.6	33.6	4.2	Emerging innovator -
ES64	Ciudad Autónoma de Melilla	46.6	40.6	12.5	Emerging innovator
ES7	Canarias	56.0	48.8	10.7	Emerging innovator
FR	France				
FR1	Île de France	149.2	130.0	2.2	Innovation leader -
FRB	Centre - Val de Loire	101.4	88.3	-4.1	Moderate innovator
FRC	Bourgogne - Franche-Comté	102.9	89.6	-4.9	Moderate innovator
FRD	Normandie	88.6	77.2	-8.5	Moderate innovator -
FRE	Hauts-de-France	95.7	83.3	3.6	Moderate innovator
FRF	Grand Est	108.4	94.4	3.1	Moderate innovator +
FRG	Pays de la Loire	113.9	99.2	9.4	Moderate innovator +
FRH	Bretagne	124.4	108.3	6.6	Strong innovator
FRI	Nouvelle-Aquitaine	107.0	93.1	1.7	Moderate innovator +
FRJ	Occitanie	134.5	117.2	1.3	Strong innovator +
FRK	Auvergne - Rhône-Alpes	133.2	116.0	1.3	Strong innovator
FRL	Provence-Alpes-Côte d'Azur	120.4	104.9	4.2	Strong innovator -
FRM	Corse	54.9	47.8	-3.2	Emerging innovator
FRY	Régions ultra¬périphériques françaisesc	78.1	68.0	10.9	Emerging innovator +
HR	Croatia				
HR02	Panonska Hrvatska	92.7	80.8	22.9	Moderate innovator
HR03	Jadranska Hrvatska	71.9	62.6	23.0	Emerging innovator +
HR05	Grad Zagreb	98.9	86.1	26.0	Moderate innovator
HR06	Sjeverna Hrvatska	96.1	83.7	21.4	Moderate innovator
IT	Italy				
ITC1	Piemonte	112.3	97.8	25.0	Moderate innovator +
ITC2	Valle d'Aosta/Vallée d'Aoste	77.4	67.4	14.7	Emerging innovator +
ITC3	Liguria	101.4	88.3	28.2	Moderate innovator
ITC4	Lombardia	117.5	102.3	27.9	Strong innovator -
ITH1	Provincia Autonoma Bolzano/Bozen	108.9	94.8	23.8	Moderate innovator +
ITH2	Provincia Autonoma Trento	123.0	107.1	29.8	Strong innovator -
ITH3	Veneto	118.0	102.8	29.0	Strong innovator -
ITH4	Friuli-Venezia Giulia	122.5	106.6	25.1	Strong innovator -
ITH5	Emilia-Romagna	125.7	109.4	34.2	Strong innovator
ITI1	Toscana	116.3	101.3	27.9	Strong innovator -
ITI2	Umbria	113.4	98.8	29.2	Moderate innovator +
ITI3	Marche	104.0	90.6	26.6	Moderate innovator +
ITI4	Lazio	115.2	100.4	26.6	Strong innovator -
ITF1	Abruzzo	97.3	84.7	22.7	Moderate innovator

		2021 relative to EU in 2014	2021 relative to EU in 2021	Change over time compared to EU in 2014	Performance subgroup
ITF2	Molise	95.2	82.9	26.4	Moderate innovator
ITF3	Campania	95.7	83.3	30.0	Moderate innovator
ITF4	Puglia	85.1	74.1	21.6	Moderate innovator -
ITF5	Basilicata	91.6	79.7	30.1	Moderate innovator -
ITF6	Calabria	78.3	68.2	20.1	Emerging innovator +
ITG1	Sicilia	80.7	70.3	21.9	Moderate innovator -
ITG2	Sardegna	80.9	70.4	19.5	Moderate innovator -
CY	Cyprus				
LV	Latvia				
LT	Lithuania				
LT01	Sostinės regionas	117.9	102.7	47.8	Strong innovator -
LT02	Vidurio ir vakarų Lietuvos regionas	77.9	67.8	31.3	Emerging innovator +
LU	Luxembourg				
HU	Hungary				
HU11	Budapest	112.0	97.6	20.6	Moderate innovator +
HU12	Pest	75.8	66.0	14.8	Emerging innovator +
HU21	Közép-Dunántúl	66.3	57.7	4.9	Emerging innovator +
HU22	Nyugat-Dunántúl	62.9	54.8	2.4	Emerging innovator +
HU23	Dél-Dunántúl	56.1	48.9	1.1	Emerging innovator
HU31	Észak-Magyarország	56.3	49.1	2.7	Emerging innovator
HU32	Észak-Alföld	58.5	50.9	6.8	Emerging innovator
HU33	Dél-Alföld	65.8	57.3	3.1	Emerging innovator +
MT	Malta				
NL	Netherlands				
NL11	Groningen	132.9	115.7	13.3	Strong innovator
NL12	Friesland	111.8	97.4	10.6	Moderate innovator +
NL13	Drenthe	108.6	94.5	5.3	Moderate innovator +
NL21	Overijssel	129.0	112.3	8.6	Strong innovator
NL22	Gelderland	140.3	122.2	12.9	Strong innovator +
NL23	Flevoland	126.0	109.7	7.1	Strong innovator
NL31	Utrecht	149.6	130.3	11.2	Innovation leader -
NL32	Noord-Holland	149.6	130.3	15.0	Innovation leader -
NL33	Zuid-Holland	141.8	123.5	13.8	Strong innovator +
NL34	Zeeland	108.8	94.7	10.6	Moderate innovator +
NL41	Noord-Brabant	147.4	128.3	14.8	Innovation leader -
NL42	Limburg	140.2	122.1	17.7	Strong innovator +
AT	Austria				
AT1	Ostösterreich	139.0	121.1	10.6	Strong innovator +
AT2	Südösterreich	134.2	116.8	9.9	Strong innovator +
AT3	Westösterreich	132.2	115.1	12.0	Strong innovator
PL	Poland				
PL21	Malopolskie	81.7	71.1	25.2	Moderate innovator -
PL22	Slaskie	58.0	50.5	12.0	Emerging innovator
PL41	Wielkopolskie	60.0	52.3	16.1	Emerging innovator +
PL42	Zachodniopomorskie	54.3	47.3	11.1	Emerging innovator
PL43	Lubuskie	54.6	47.5	11.8	Emerging innovator
PL51	Dolnoslaskie	74.1	64.5	22.1	Emerging innovator +
PL52	Opolskie	55.6	48.4	15.4	Emerging innovator

		2021 relative to EU in 2014	2021 relative to EU in 2021	Change over time compared to EU in 2014	Performance subgroup
PL61	Kujawsko-Pomorskie	56.6	49.3	16.7	Emerging innovator
PL62	Warminsko-Mazurskie	48.8	42.5	12.0	Emerging innovator
PL63	Pomorskie	73.0	63.6	20.2	Emerging innovator +
PL71	Lódzkie	60.7	52.8	15.2	Emerging innovator +
PL72	Swietokrzyskie	46.8	40.7	11.0	Emerging innovator
PL81	Lubelskie	60.8	53.0	19.3	Emerging innovator +
PL82	Podkarpackie	65.5	57.0	14.4	Emerging innovator +
PL84	Podlaskie	56.6	49.3	13.4	Emerging innovator
PL91	Warszawski stoleczny	101.2	88.1	29.9	Moderate innovator
PL92	Mazowiecki regionalny	41.7	36.3	11.8	Emerging innovator
PT	Portugal				
PT11	Norte	92.2	80.3	11.8	Moderate innovator
PT15	Algarve	66.2	57.6	4.9	Emerging innovator +
PT16	Centro	90.5	78.8	8.0	Moderate innovator -
PT17	Lisboa	103.0	89.7	6.2	Moderate innovator
PT18	Alentejo	76.6	66.7	8.6	Emerging innovator +
PT2	Região Autónoma dos Açores	52.8	46.0	6.5	Emerging innovator
PT3	Região Autónoma da Madeira	61.5	53.6	0.4	Emerging innovator +
RO	Romania				
RO11	Nord-Vest	36.0	31.4	9.2	Emerging innovator -
RO12	Centru	30.4	26.5	5.4	Emerging innovator -
RO21	Nord-Est	23.9	20.9	-1.0	Emerging innovator -
RO22	Sud-Est	20.0	17.4	-2.7	Emerging innovator -
RO31	Sud - Muntenia	20.7	18.0	1.3	Emerging innovator -
RO32	Bucuresti - Ilfov	65.4	56.9	12.4	Emerging innovator +
RO41	Sud-Vest Oltenia	19.2	16.7	4.4	Emerging innovator -
RO42	Vest	34.8	30.3	8.8	Emerging innovator -
SI	Slovenia				
SI03	Vzhodna Slovenija	91.6	79.8	4.5	Moderate innovator -
SI04	Zahodna Slovenija	112.7	98.1	5.7	Moderate innovator +
SK	Slovakia				
SK01	Bratislavský kraj	100.4	87.5	-0.6	Moderate innovator
SK02	Západné Slovensko	63.8	55.5	9.5	Emerging innovator +
SK03	Stredné Slovensko	66.0	57.5	10.0	Emerging innovator +
SK04	Východné Slovensko	62.7	54.6	4.3	Emerging innovator +
FI	Finland				
FI1B	Helsinki-Uusimaa	174.2	151.7	20.6	Innovation leader +
FI1C	Helsinki-Uusimaa	134.4	117.0	19.0	Strong innovator +
FI19	Etelä-Suomi	150.1	130.7	24.7	Innovation leader -
FI1D	Pohjois- ja Länsi-Suomi	136.2	118.6	18.7	Strong innovator +
FI2	Åland	125.5	109.3	20.9	Strong innovator
SE	Sweden				
SE11	Stockholm	177.5	154.5	17.4	Innovation leader +
SE12	Östra Mellansverige	152.5	132.8	12.5	Innovation leader -
SE21	Småland med öarna	126.8	110.5	16.0	Strong innovator
SE22	Sydsverige	162.9	141.8	13.4	Innovation leader
SE23	Västsverige	158.2	137.8	13.4	Innovation leader
SE31	Norra Mellansverige	115.7	100.7	15.5	Strong innovator -

		2021 relative to EU in 2014	2021 relative to EU in 2021	Change over time compared to EU in 2014	Performance subgroup
SE32	Mellersta Norrland	116.1	101.1	8.9	Strong innovator -
SE33	Övre Norrland	136.9	119.2	6.5	Strong innovator +
NO	Norway				
NO01	Oslo og Akershus	154.2	134.3	23.7	Innovation leader -
NO02	Hedmark og Oppland	107.3	93.5	27.2	Moderate innovator +
NO03	Sør-Østlandet	119.1	103.7	26.3	Strong innovator -
NO04	Agder og Rogaland	122.5	106.7	26.1	Strong innovator -
NO05	Vestlandet	133.4	116.2	26.9	Strong innovator
NO06	Trøndelag	148.9	129.7	20.3	Innovation leader -
NO07	Nord-Norge	115.5	100.6	15.5	Strong innovator -
CH	Switzerland				
CH01	Région lémanique	153.4	133.6	2.2	Innovation leader -
CH02	Espace Mittelland	148.6	129.4	12.7	Innovation leader -
CH03	Nordwestschweiz	158.6	138.1	0.8	Innovation leader
CH04	Zürich	168.2	146.4	-2.5	Innovation leader +
CH05	Ostschweiz	153.7	133.8	10.8	Innovation leader -
CH06	Zentralschweiz	156.1	136.0	9.5	Innovation leader
CH07	Ticino	163.9	142.7	20.2	Innovation leader
RS	Serbia				
RS11	Belgrade	92.1	80.2	26.2	Moderate innovator
RS12	Vojvodina	66.8	58.2	10.1	Emerging innovator +
RS21	Šumadija and Western Serbia	60.8	52.9	10.6	Emerging innovator +
RS22	Southern and Eastern Serbia	61.5	53.6	16.3	Emerging innovator +
UK	United Kingdom				
UKC	North East	128.6	112.0	19.9	Strong innovator
UKD	North West	130.9	114.0	10.8	Strong innovator
UKE	Yorkshire and The Humber	130.1	113.3	18.2	Strong innovator
UKF	East Midlands	135.0	117.6	10.9	Strong innovator +
UKG	West Midlands	139.1	121.1	20.6	Strong innovator +
UKH	East of England	149.9	130.5	15.6	Innovation leader -
UKI	London	152.7	133.0	11.0	Innovation leader -
UKJ	South East	158.0	137.6	17.6	Innovation leader
UKK	South West	143.2	124.7	13.3	Strong innovator +
UKL	Wales	131.5	114.5	21.2	Strong innovator
UKM	Scotland	140.3	122.2	19.2	Strong innovator +
UKN	Northern Ireland	122.6	106.8	20.4	Strong innovator -

Annex 3: RIS normalised database

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	Life-long 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
EU27	EU27																					
BE	Belgium																					
BE1	Région de Bruxelles-Capitale	0.915	0.398	1.000	0.652	0.586	0.518	0.438	0.524	1.000	1.000	0.689	0.891	1.000	1.000	0.436	0.534	0.392	0.681	0.836	0.965	0.521
BE2	Vlaams Gewest	0.809	0.320	0.800	0.759	0.603	0.573	0.718	0.477	0.986	0.674	0.600	1.000	1.000	0.714	0.637	0.452	0.539	0.626	0.909	0.763	0.501
BE3	Région wallonne	0.604	0.246	0.576	0.554	0.568	0.408	0.732	0.530	1.000	0.503	0.618	0.789	1.000	0.503	0.577	0.405	0.360	0.510	0.763	0.776	0.613
BG	Bulgaria																					
BG31	Severozapaden	0.071	0.041	0.104	0.000	0.061	0.048	0.144	0.373	0.254	0.115	0.282	0.190	0.099	0.102	0.173	0.145	0.353	0.243	0.284	0.483	0.135
BG32	Severen tsentralen	0.445	0.060	0.165	0.015	0.067	0.000	0.104	0.296	0.225	0.212	0.336	0.183	0.167	0.099	0.217	0.385	0.514	0.414	0.380	0.468	0.215
BG33	Severoiztochen	0.263	0.048	0.223	0.109	0.071	0.097	0.093	0.278	0.224	0.152	0.319	0.126	0.140	0.177	0.161	0.366	1.000	0.334	0.207	0.364	0.295
BG34	Yugoiztochen	0.182	0.045	0.159	0.000	0.074	0.035	0.090	0.237	0.208	0.090	0.317	0.134	0.124	0.149	0.166	0.240	0.356	0.314	0.225	0.408	0.317
BG41	Yugozapaden	0.728	0.127	0.497	0.102	0.084	0.214	0.287	0.279	0.361	0.866	0.429	0.240	0.250	0.381	0.267	0.600	0.654	0.736	0.302	0.494	0.000
BG42	Yuzhen tsentralen	0.286	0.052	0.232	0.088	0.074	0.055	0.122	0.313	0.244	0.150	0.317	0.186	0.127	0.208	0.195	0.397	0.613	0.334	0.297	0.590	0.192
CZ	Czechia																					
CZ01	Praha	0.998	0.387	1.000	0.259	0.454	0.960	0.456	0.351	0.613	1.000	0.550	0.649	0.441	0.945	0.258	0.513	0.453	1.000	0.564	0.577	0.285
CZ02	Střední Čechy	0.343	0.287	0.380	0.253	0.420	0.366	0.750	0.558	0.588	0.544	0.812	0.791	0.757	0.328	0.296	0.204	0.420	0.817	0.623	0.627	0.333
CZ03	Jihozápad	0.263	0.223	0.588	0.301	0.407	0.304	0.362	0.543	0.477	0.256	0.439	0.589	0.595	0.482	0.259	0.204	0.264	0.817	0.459	0.470	0.449
CZ04	Severozápad	0.087	0.190	0.193	0.080	0.359	0.035	0.093	0.475	0.437	0.135	0.274	0.385	0.309	0.202	0.235	0.141	0.221	0.595	0.401	0.456	0.354
CZ05	Severovýchod	0.310	0.287	0.419	0.177	0.407	0.214	0.398	0.617	0.528	0.287	0.536	0.613	0.554	0.390	0.357	0.240	0.511	0.942	0.559	0.722	0.323
CZ06	Jihovýchod	0.548	0.376	0.635	0.246	0.420	0.643	0.488	0.541	0.532	0.499	0.531	0.558	0.516	0.542	0.345	0.235	0.409	0.766	0.576	0.782	0.292
CZ07	Střední Morava	0.286	0.298	0.522	0.264	0.393	0.283	0.402	0.565	0.505	0.194	0.423	0.552	0.380	0.392	0.346	0.213	0.619	0.776	0.553	0.555	0.186
CZ08	Moravskoslezsko	0.267	0.320	0.433	0.227	0.434	0.235	0.269	0.701	0.604	0.441	0.633	0.731	0.441	0.370	0.241	0.213	0.363	0.792	0.518	0.613	0.000
DK	Denmark																					
DK01	Hovedstaden	1.000	1.000	1.000	0.841	0.934	1.000	1.000	0.366	0.559	1.000	0.735	0.905	0.635	1.000	0.890	0.741	0.735	0.822	0.670	0.804	0.624
DK02	Sjælland	0.284	0.905	0.508	0.589	0.898	0.449	0.262	0.385	0.559	0.397	0.582	0.520	0.549	0.541	0.558	0.307	0.457	0.455	0.670	0.953	0.647
DK03	Syddanmark	0.536	0.905	0.776	0.668	0.922	0.435	0.391	0.328	0.559	0.326	0.568	0.608	0.570	0.643	0.725	0.557	0.758	0.445	0.670	0.608	0.629
DK04	Midtjylland	0.690	0.894	0.981	0.779	0.934	0.649	0.535	0.598	0.559	0.591	0.704	0.815	0.597	0.874	0.853	0.628	1.000	0.550	0.670	0.763	0.656
DK05	Nordjylland	0.486	0.875	1.000	0.826	0.922	0.712	0.194	0.291	0.559	0.404	0.731	0.750	0.521	0.916	0.776	0.462	0.597	0.359	0.670	0.793	0.704

		Population with tertiary education	Life-long 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
DE	Germany																					
DE11	Stuttgart	0.600	0.331	0.442	0.505	0.707	0.304	1.000	0.420	0.610	0.599	0.950	1.000	0.536	0.663	1.000	0.501	0.871	1.000	0.967	0.637	0.600
DE12	Karlsruhe	0.574	0.350	0.937	0.681	0.707	1.000	1.000	0.410	0.650	0.850	0.921	0.967	0.607	0.991	0.945	0.564	0.545	0.952	0.976	0.593	0.612
DE13	Freiburg	0.441	0.298	0.663	0.571	0.707	0.705	0.639	0.475	0.626	0.356	0.866	1.000	0.559	0.672	0.921	0.541	0.808	0.776	0.965	0.587	0.672
DE14	Tübingen	0.526	0.328	0.826	0.587	0.707	0.677	1.000	0.399	0.609	0.437	0.770	0.899	0.603	0.941	1.000	0.538	0.834	1.000	0.950	0.545	0.632
DE21	Oberbayern	0.763	0.313	0.858	0.683	0.707	0.739	1.000	0.421	0.649	0.881	0.994	1.000	0.795	1.000	1.000	0.753	0.800	1.000	0.966	0.741	0.544
DE22	Niederbayern	0.298	0.201	0.241	0.645	0.707	0.097	0.441	0.465	0.521	0.330	0.831	0.717	0.456	0.326	0.776	0.320	0.603	0.872	0.902	0.521	0.528
DE23	Oberpfalz	0.441	0.238	0.533	0.643	0.707	0.345	0.718	0.470	0.555	0.293	0.888	0.637	0.834	0.600	1.000	0.354	0.615	0.847	0.877	0.602	0.540
DE24	Oberfranken	0.417	0.283	0.517	0.580	0.707	0.401	0.563	0.434	0.562	0.295	0.614	0.829	0.665	0.560	0.930	0.510	0.756	0.666	0.927	0.421	0.573
DE25	Mittelfranken	0.450	0.261	0.664	0.667	0.707	0.629	0.962	0.364	0.590	0.630	0.836	0.799	0.474	0.856	1.000	0.546	1.000	0.746	0.922	0.472	0.547
DE26	Unterfranken	0.396	0.328	0.641	0.527	0.707	0.435	0.804	0.453	0.585	0.333	0.723	1.000	0.657	0.669	0.912	0.421	0.706	0.867	0.921	0.492	0.608
DE27	Schwaben	0.358	0.216	0.312	0.444	0.707	0.145	0.520	0.387	0.563	0.385	0.771	1.000	0.658	0.403	0.879	0.508	0.640	0.852	0.917	0.589	0.598
DE3	Berlin	0.804	0.380	0.909	0.597	0.717	1.000	0.506	0.731	0.670	1.000	0.943	1.000	0.474	1.000	0.721	0.886	0.651	0.827	0.908	0.688	0.401
DE4	Brandenburg	0.151	0.242	0.657	0.753	0.632	0.732	0.219	0.690	0.504	0.289	0.641	0.890	0.309	0.569	0.540	0.245	0.268	0.384	0.811	0.538	0.479
DE5	Bremen	0.343	0.384	0.903	0.577	0.745	1.000	0.334	0.319	0.597	0.478	0.704	0.900	0.392	0.893	0.505	0.428	0.353	0.611	0.890	0.507	0.536
DE6	Hamburg	0.578	0.387	0.874	0.561	0.726	0.643	0.463	0.405	0.615	0.894	0.986	0.866	0.927	0.913	0.516	0.814	0.563	0.917	0.934	0.578	0.497
DE71	Darmstadt	0.552	0.343	0.631	0.558	0.707	0.497	0.933	0.352	0.647	0.703	0.926	0.795	0.663	0.798	0.781	0.538	0.612	0.857	0.945	0.673	0.583
DE72	Gießen	0.422	0.432	0.786	0.556	0.707	0.788	0.538	0.452	0.611	0.373	0.946	0.757	0.722	0.788	0.704	0.449	0.659	0.646	0.940	0.741	0.592
DE73	Kassel	0.308	0.320	0.347	0.395	0.707	0.263	0.459	0.354	0.591	0.265	0.860	0.968	0.515	0.443	0.575	0.244	0.412	0.631	0.913	0.686	0.604
DE8	Mecklenburg-Vorpommern	0.230	0.294	0.634	0.454	0.660	0.829	0.222	0.693	0.534	0.221	0.519	0.870	0.415	0.675	0.402	0.195	0.320	0.369	0.815	0.388	0.556
DE91	Braunschweig	0.431	0.346	0.880	0.637	0.717	1.000	1.000	0.403	0.635	0.383	1.000	1.000	1.000	0.977	0.777	0.228	0.300	1.000	0.944	0.550	0.595
DE92	Hannover	0.339	0.331	0.617	0.470	0.717	0.670	0.484	0.464	0.590	0.460	0.793	1.000	0.729	0.713	0.849	0.431	0.512	0.651	0.910	0.606	0.571
DE93	Lüneburg	0.189	0.238	0.215	0.465	0.717	0.090	0.276	0.371	0.540	0.343	0.877	1.000	0.432	0.261	0.597	0.471	0.452	0.550	0.892	0.467	0.577
DE94	Weser-Ems	0.206	0.227	0.355	0.417	0.717	0.242	0.219	0.375	0.532	0.189	0.549	0.747	0.490	0.420	0.586	0.366	0.548	0.490	0.868	0.361	0.558
DEA1	Düsseldorf	0.308	0.264	0.498	0.602	0.707	0.352	0.549	0.334	0.593	0.451	0.664	0.851	0.453	0.615	0.791	0.592	0.700	0.631	0.916	0.451	0.539
DEA2	Köln	0.467	0.305	0.800	0.649	0.707	1.000	0.477	0.380	0.634	0.680	0.998	0.789	0.841	0.826	0.788	0.535	0.526	0.691	0.942	0.627	0.590
DEA3	Münster	0.327	0.324	0.497	0.659	0.707	0.408	0.240	0.335	0.559	0.391	0.807	0.883	0.560	0.541	0.646	0.508	0.764	0.500	0.886	0.615	0.513
DEA4	Detmold	0.251	0.272	0.420	0.560	0.707	0.339	0.545	0.418	0.572	0.421	1.000	1.000	0.613	0.440	0.797	0.643	1.000	0.621	0.944	0.694	0.563
DEA5	Arnsberg	0.225	0.317	0.502	0.479	0.707	0.504	0.380	0.373	0.583	0.384	0.811	0.942	0.523	0.538	0.685	0.465	0.975	0.626	0.941	0.572	0.578
DEB1	Koblenz	0.263	0.268	0.232	0.447	0.698	0.104	0.205	0.373	0.562	0.343	0.934	1.000	0.613	0.286	0.657	0.521	0.701	0.555	0.930	0.487	0.613
DEB2	Trier	0.472	0.272	0.385	0.519	0.698	0.269	0.187	0.538	0.517	0.320	1.000	0.865	0.434	0.315	0.565	0.537	0.539	0.455	0.836	0.632	0.693

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DEB3	Rheinhessen-Pfalz	0.408	0.320	0.710	0.667	0.698	0.725	1.000	0.344	0.640	0.521	0.865	0.887	0.906	0.845	1.000	0.505	0.696	0.842	0.909	0.629	0.594
DEC	Saarland	0.317	0.279	0.640	0.452	0.717	0.580	0.326	0.313	0.609	0.419	0.839	1.000	0.389	0.715	0.613	0.352	0.597	0.590	0.907	0.479	0.630
DED2	Dresden	0.422	0.350	0.849	0.591	0.670	1.000	0.718	0.736	0.540	0.383	0.786	1.000	0.743	0.837	0.756	0.272	0.319	0.641	0.895	0.652	0.428
DED4	Chemnitz	0.258	0.264	0.399	0.390	0.670	0.580	0.377	0.703	0.521	0.220	0.708	0.966	0.634	0.485	0.538	0.169	0.332	0.691	0.889	0.660	0.541
DED5	Leipzig	0.559	0.391	0.882	0.597	0.670	1.000	0.151	0.755	0.552	0.616	0.819	0.903	0.521	0.871	0.425	0.288	0.290	0.636	0.863	0.649	0.502
DEE	Sachsen-Anhalt	0.116	0.246	0.560	0.485	0.707	0.774	0.161	0.747	0.525	0.203	0.606	0.871	0.472	0.609	0.450	0.137	0.221	0.460	0.849	0.519	0.534
DEF	Schleswig-Holstein	0.208	0.320	0.580	0.622	0.726	0.525	0.316	0.354	0.585	0.409	0.859	0.917	0.589	0.604	0.598	0.463	0.706	0.490	0.871	0.535	0.573
DEG	Thüringen	0.339	0.305	0.604	0.531	0.707	0.760	0.413	0.729	0.574	0.257	0.620	0.858	0.522	0.637	0.715	0.217	0.372	0.525	0.901	0.605	0.589
EE	Estonia																					
IE	Ireland																					
IE04	Northern and Western	0.885	0.413	0.674	0.593	0.543	0.187	0.305	0.357	0.752	0.308	0.614	0.480	0.974	0.556	0.401	0.317	0.428	0.364	0.322	0.590	0.810
IE05	Southern	0.847	0.391	0.648	0.735	0.594	0.187	0.305	0.378	0.719	0.391	0.654	0.675	0.960	0.566	0.401	0.126	0.165	0.555	0.559	0.916	0.788
IE06	Eastern and Midland	1.000	0.540	0.859	0.613	0.620	0.187	0.305	0.340	1.000	0.904	0.566	0.583	0.873	0.721	0.401	0.411	0.438	0.751	0.349	0.696	0.757
EL	Greece																					
EL3	Attiki	0.828	0.201	0.639	0.471	0.379	0.401	0.330	0.419	0.615	0.529	0.931	0.976	0.896	0.579	0.313	0.366	0.272	0.696	0.767	0.919	0.261
EL41	Voreio Aigaio	0.559	0.104	0.520	0.546	0.279	0.408	0.014	0.359	0.422	0.038	0.830	0.889	1.000	0.371	0.090	0.170	0.000	0.198	0.834	0.650	0.320
EL42	Notio Aigaio	0.343	0.101	0.140	0.746	0.279	0.104	0.004	0.534	0.419	0.059	0.716	0.734	0.228	0.121	0.122	0.095	0.129	0.178	0.394	0.550	0.472
EL43	Kriti	0.408	0.130	0.753	0.551	0.279	0.857	0.054	0.753	0.647	0.062	0.865	0.970	1.000	0.645	0.251	0.376	0.280	0.093	0.746	0.967	0.452
EL51	Anatoliki Makedonia, Thraki	0.429	0.153	0.437	0.463	0.345	0.352	0.068	0.404	0.362	0.011	0.750	0.846	0.574	0.337	0.135	0.095	0.199	0.138	0.641	0.809	0.100
EL52	Kentriki Makedonia	0.645	0.127	0.578	0.474	0.345	0.435	0.151	0.589	0.535	0.191	1.000	1.000	0.881	0.503	0.256	0.512	0.314	0.304	0.775	0.948	0.000
EL53	Dytiki Makedonia	0.647	0.153	0.333	0.282	0.345	0.228	0.043	0.515	0.302	0.127	0.569	0.619	0.544	0.359	0.154	0.217	0.000	0.000	0.470	0.596	0.211
EL54	Ipeiros	0.714	0.052	0.778	0.497	0.325	0.712	0.083	0.440	0.424	0.127	0.750	0.911	0.725	0.533	0.199	0.151	0.094	0.118	0.741	0.719	0.543
EL61	Thessalia	0.699	0.093	0.539	0.553	0.345	0.394	0.065	0.475	0.618	0.011	0.957	0.919	1.000	0.426	0.141	0.227	0.273	0.133	0.838	0.916	0.473
EL62	Ionia Nisia	0.540	0.182	0.264	0.409	0.325	0.159	0.029	0.935	0.893	0.023	0.458	0.517	0.871	0.193	0.128	0.119	0.000	0.088	0.463	1.000	0.570
EL63	Dytiki Ellada	0.398	0.194	0.639	0.489	0.325	0.677	0.093	0.525	0.559	0.104	0.989	0.839	1.000	0.541	0.248	0.123	0.066	0.062	0.604	0.701	0.565
EL64	Sterea Ellada	0.531	0.048	0.213	0.925	0.325	0.069	0.129	0.701	0.613	0.023	0.679	0.840	0.478	0.274	0.075	0.109	0.180	0.228	0.759	0.701	0.593
EL65	Peloponnisos	0.445	0.026	0.233	0.472	0.325	0.193	0.104	0.445	0.432	0.022	0.825	0.943	0.743	0.210	0.136	0.227	0.172	0.128	0.729	0.582	0.615
ES	Spain																					
ES11	Galicia	0.794	0.402	0.556	0.507	0.613	0.311	0.169	0.333	0.420	0.363	0.243	0.212	0.408	0.436	0.320	0.388	0.268	0.435	0.232	0.637	0.715
ES12	Principado de Asturias	0.870	0.324	0.573	0.410	0.640	0.207	0.172	0.279	0.455	0.518	0.223	0.163	0.352	0.462	0.372	0.160	0.280	0.354	0.259	0.570	0.535

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ES13	Cantabria	0.868	0.421	0.626	0.542	0.640	0.332	0.122	0.311	0.397	0.190	0.237	0.172	0.273	0.516	0.377	0.407	0.182	0.309	0.246	0.434	0.559
ES21	País Vasco	1.000	0.484	0.687	0.614	0.640	0.318	0.549	0.280	0.688	0.427	0.408	0.367	0.640	0.715	0.399	0.424	0.358	0.706	0.473	0.722	0.604
ES22	Comunidad Foral de Navarra	0.963	0.484	0.696	0.555	0.666	0.373	0.413	0.466	0.618	0.303	0.264	0.286	0.398	0.626	0.472	0.488	0.497	0.696	0.414	0.524	0.685
ES23	La Rioja	0.642	0.395	0.559	0.495	0.631	0.276	0.140	0.385	0.442	0.117	0.211	0.247	0.359	0.379	0.340	0.827	0.665	0.254	0.336	0.592	0.661
ES24	Aragón	0.773	0.361	0.600	0.412	0.648	0.269	0.183	0.352	0.494	0.309	0.229	0.248	0.264	0.494	0.507	0.441	0.298	0.505	0.237	0.627	0.726
ES3	Comunidad de Madrid	0.930	0.439	0.776	0.473	0.666	0.463	0.359	0.317	0.556	1.000	0.255	0.301	0.275	0.659	0.364	0.635	0.370	0.797	0.255	0.625	0.694
ES41	Castilla y León	0.790	0.406	0.516	0.351	0.622	0.304	0.309	0.496	0.571	0.227	0.269	0.215	0.295	0.404	0.281	0.271	0.206	0.379	0.271	0.566	0.785
ES42	Castilla-la Mancha	0.604	0.339	0.365	0.573	0.604	0.152	0.111	0.357	0.367	0.229	0.205	0.203	0.196	0.294	0.208	0.414	0.295	0.269	0.193	0.476	0.690
ES43	Extremadura	0.538	0.380	0.417	0.378	0.622	0.345	0.054	0.282	0.328	0.148	0.175	0.206	0.297	0.306	0.143	0.185	0.183	0.078	0.185	0.682	0.853
ES51	Cataluña	0.863	0.346	0.739	0.617	0.666	0.394	0.337	0.337	0.525	0.464	0.361	0.325	0.284	0.652	0.507	0.779	0.561	0.681	0.359	0.626	0.555
ES52	Comunitat Valenciana	0.742	0.462	0.581	0.520	0.640	0.387	0.172	0.365	0.459	0.320	0.285	0.315	0.280	0.453	0.425	0.879	0.862	0.374	0.294	0.625	0.698
ES53	Illes Balears	0.502	0.395	0.453	0.593	0.657	0.166	0.050	0.318	0.399	0.298	0.175	0.121	0.135	0.326	0.198	0.700	0.611	0.213	0.085	0.366	0.722
ES61	Andalucía	0.531	0.358	0.521	0.484	0.622	0.387	0.122	0.318	0.392	0.248	0.200	0.244	0.216	0.355	0.309	0.338	0.279	0.284	0.173	0.475	0.641
ES62	Región de Murcia	0.524	0.454	0.538	0.489	0.640	0.332	0.165	0.407	0.430	0.130	0.242	0.228	0.194	0.427	0.316	0.755	0.565	0.223	0.200	0.551	0.661
ES63	Ciudad de Ceuta	0.310	0.410	0.185	0.000	0.648	0.014	0.022	0.000	n/a	0.227	0.000	0.000	0.000	0.000	0.000	0.095	0.209	0.198	n/a	0.439	0.617
ES64	Ciudad de Melilla	0.422	0.462	0.056	0.000	0.640	0.048	0.022	0.069	n/a	0.227	0.204	0.252	0.090	0.000	0.207	0.192	0.000	0.088	n/a	0.626	0.468
ES7	Canarias	0.645	0.372	0.443	0.394	0.631	0.249	0.032	0.292	0.350	0.219	0.100	0.155	0.158	0.335	0.000	0.259	0.166	0.208	0.034	0.115	n/a
FR	France																					
FR1	Île de France	1.000	0.693	0.766	0.536	0.577	0.560	0.714	0.341	0.836	1.000	0.789	0.664	0.665	0.731	0.696	0.451	0.595	0.842	0.674	0.484	0.526
FRB	Centre - Val de Loire	0.548	0.745	0.410	0.486	0.501	0.278	0.420	0.300	0.439	0.181	0.646	0.501	0.549	0.357	0.544	0.117	0.253	0.409	0.717	0.500	0.709
FRC	Bourgogne - Franche-Comté	0.574	0.629	0.425	0.450	0.493	0.217	0.469	0.320	0.527	0.183	0.592	0.584	0.478	0.372	0.558	0.174	0.481	0.435	0.654	0.406	0.726
FRD	Normandie	0.472	0.708	0.392	0.321	0.484	0.186	0.372	0.213	0.375	0.157	0.542	0.452	0.397	0.344	0.548	0.134	0.339	0.430	0.535	0.351	0.648
FRE	Hauts-de-France	0.657	0.614	0.437	0.410	0.518	0.237	0.238	0.227	0.505	0.324	0.642	0.522	0.445	0.371	0.529	0.189	0.491	0.384	0.504	0.299	0.519
FRF	Grand Est	0.590	0.745	0.532	0.390	0.501	0.383	0.245	0.511	0.629	0.289	0.617	0.648	0.439	0.424	0.561	0.213	0.381	0.440	0.684	0.428	0.625
FRG	Pays de la Loire	0.692	0.808	0.451	0.439	0.543	0.256	0.283	0.279	0.482	0.532	0.771	0.693	0.663	0.399	0.473	0.191	0.390	0.565	0.700	0.472	0.703
FRH	Bretagne	0.752	0.804	0.552	0.515	0.535	0.484	0.445	0.570	0.933	0.388	0.675	0.630	0.577	0.489	0.697	0.196	0.243	0.309	0.664	0.613	0.718
FRI	Nouvelle-Aquitaine	0.619	0.756	0.494	0.501	0.518	0.316	0.293	0.474	0.590	0.232	0.624	0.563	0.563	0.467	0.481	0.233	0.339	0.309	0.575	0.450	0.737
FRJ	Occitanie	0.780	0.804	0.665	0.615	0.510	0.990	0.802	0.431	0.662	0.484	0.649	0.655	0.542	0.589	0.601	0.214	0.410	0.540	0.628	0.429	0.747
FRK	Auvergne - Rhône-Alpes	0.851	0.901	0.629	0.481	0.526	0.572	0.649	0.336	0.624	0.419	0.753	0.662	0.705	0.598	0.848	0.243	0.429	0.535	0.693	0.476	0.691

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FRL	Provence-Alpes-Côte d'Azur	0.695	0.622	0.594	0.491	0.526	0.629	0.545	0.431	0.701	0.447	0.626	0.685	0.523	0.524	0.539	0.288	0.430	0.419	0.502	0.581	0.608
FRM	Corse	0.320	0.268	0.304	0.328	0.476	0.137	0.014	0.282	0.296	0.274	0.159	0.312	0.164	0.218	0.218	0.143	0.267	0.133	0.000	0.142	0.745
FRY	Régions ultra-périphériques françaises	0.370	0.384	0.251	0.456	0.425	0.406	0.022	1.000	1.000	0.211	0.514	0.479	0.322	0.171	0.177	0.000	0.000	0.128	0.361	0.371	n/a
HR	Croatia																					
HR02	Panonska Hrvatska	0.450	0.138	1.000	0.943	0.597	0.401	0.222	0.569	0.433	0.489	0.811	0.741	0.441	1.000	0.237	0.204	0.225	0.460	0.566	0.580	0.179
HR03	Jadranska Hrvatska	0.540	0.112	0.451	0.204	0.646	0.200	0.054	0.514	0.358	0.204	0.720	0.641	0.406	0.371	0.248	0.123	0.164	0.424	0.487	0.905	0.505
HR05	Grad Zagreb	0.450	0.138	1.000	0.943	0.597	0.401	0.222	0.383	0.477	0.489	0.930	0.852	0.670	1.000	0.237	0.204	0.225	0.460	0.684	0.854	0.179
HR06	Sjeverna Hrvatska	0.450	0.138	1.000	0.943	0.597	0.401	0.222	0.546	0.391	0.489	0.813	0.775	0.607	1.000	0.237	0.204	0.225	0.460	0.654	0.742	0.179
IT	Italy																					
ITC1	Piemonte	0.284	0.328	0.589	0.581	0.317	0.214	0.646	0.579	0.632	0.467	0.766	0.925	0.720	0.568	0.549	0.430	0.563	0.907	0.800	0.808	0.233
ITC2	Valle d'Aosta/Vallée d'Aoste	0.272	0.339	0.375	0.407	0.329	0.055	0.118	0.371	n/a	0.554	0.587	0.744	0.163	0.389	0.354	0.256	0.488	0.093	n/a	0.808	0.718
ITC3	Liguria	0.353	0.365	0.729	0.619	0.323	0.394	0.269	0.449	n/a	0.418	0.648	0.772	0.606	0.696	0.429	0.347	0.268	0.636	n/a	0.808	0.591
ITC4	Lombardia	0.405	0.339	0.644	0.630	0.341	0.180	0.370	0.476	0.747	0.611	0.829	1.000	0.627	0.620	0.532	0.662	0.716	0.892	0.870	0.808	0.153
ITH1	Provincia Autonoma Bolzano/Bozen	0.232	0.376	0.618	0.754	0.329	0.117	0.190	0.558	1.000	0.255	0.683	0.938	0.757	0.515	0.412	0.617	0.615	0.299	0.883	0.808	0.588
ITH2	Provincia Autonoma Trento	0.377	0.428	0.964	0.735	0.364	0.608	0.237	0.593	0.782	0.456	0.761	0.915	0.846	0.825	0.489	0.456	0.570	0.460	0.840	0.808	0.521
ITH3	Veneto	0.384	0.369	0.619	0.608	0.341	0.242	0.362	0.564	0.758	0.293	0.917	1.000	0.721	0.554	0.567	0.710	0.983	0.661	0.910	0.808	0.138
ITH4	Friuli-Venezia Giulia	0.396	0.406	0.866	0.535	0.341	0.504	0.323	0.757	0.720	0.409	0.671	0.969	0.648	0.689	0.573	0.472	0.962	0.621	0.832	0.808	0.479
ITH5	Emilia-Romagna	0.436	0.387	0.695	0.592	0.347	0.311	0.556	0.502	0.718	0.396	0.864	0.997	0.760	0.673	0.651	0.648	0.940	0.787	0.914	0.808	0.338
ITI1	Toscana	0.308	0.350	0.763	0.716	0.335	0.387	0.341	0.491	0.720	0.334	0.828	0.930	0.565	0.719	0.528	0.604	0.712	0.540	0.837	0.808	0.518
ITI2	Umbria	0.377	0.380	0.699	0.752	0.335	0.359	0.176	0.614	0.784	0.408	0.693	0.811	0.553	0.621	0.414	0.424	1.000	0.540	0.772	0.808	0.505
ITI3	Marche	0.393	0.287	0.559	0.681	0.335	0.249	0.244	0.665	0.571	0.185	0.612	0.719	0.424	0.469	0.463	0.571	1.000	0.585	0.656	0.808	0.548
ITI4	Lazio	0.441	0.317	0.748	0.581	0.341	0.712	0.233	0.404	0.738	0.995	0.787	0.838	0.587	0.666	0.359	0.395	0.410	0.666	0.728	0.808	0.462
ITF1	Abruzzo	0.249	0.268	0.665	0.565	0.323	0.311	0.154	0.643	0.559	0.334	0.664	0.905	0.271	0.542	0.389	0.338	0.376	0.621	0.776	0.808	0.552
ITF2	Molise	0.327	0.287	0.613	0.617	0.281	0.214	0.334	0.626	0.841	0.248	0.451	0.832	0.408	0.651	0.245	0.306	0.138	0.646	0.581	0.808	0.636
ITF3	Campania	0.170	0.197	0.548	0.724	0.293	0.456	0.215	0.609	0.589	0.329	0.603	0.767	0.573	0.537	0.307	0.408	0.381	0.435	0.657	0.808	0.534
ITF4	Puglia	0.132	0.216	0.472	0.631	0.281	0.290	0.115	0.586	0.539	0.177	0.695	0.746	0.351	0.442	0.303	0.351	0.548	0.344	0.516	0.808	0.481
ITF5	Basilicata	0.298	0.261	0.463	0.433	0.287	0.283	0.068	0.761	0.614	0.223	0.876	0.915	0.336	0.468	0.204	0.124	0.442	0.570	0.635	0.808	0.634

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ITF6	Calabria	0.158	0.212	0.445	0.611	0.281	0.256	0.054	0.526	0.543	0.187	0.547	0.836	0.443	0.380	0.268	0.159	0.214	0.198	0.566	0.808	0.607
ITG1	Sicilia	0.099	0.179	0.487	0.665	0.275	0.339	0.108	0.643	0.605	0.161	0.537	0.790	0.332	0.424	0.249	0.219	0.188	0.248	0.610	0.808	0.586
ITG2	Sardegna	0.168	0.317	0.543	0.520	0.323	0.456	0.043	0.343	0.574	0.195	0.560	0.738	0.335	0.446	0.225	0.194	0.233	0.243	0.636	0.808	0.674
CY	Cyprus																					
LV	Latvia																					
LT	Lithuania																					
LT01	Sostinės regionas	1.000	0.302	0.694	0.225	0.567	0.442	0.230	0.617	0.650	0.859	0.782	0.835	0.765	0.514	0.218	0.792	0.458	0.651	0.776	0.735	0.531
LT02	Vidurio ir vakarų Lietuvos regionas	0.801	0.242	0.368	0.215	0.549	0.311	0.079	0.615	0.485	0.153	0.578	0.634	0.463	0.234	0.218	0.249	0.188	0.223	0.578	0.624	0.541
LU	Luxembourg																					
HU	Hungary																					
HU11	Budapest	0.873	0.298	0.807	0.279	0.430	0.352	0.721	0.352	0.690	1.000	0.511	0.294	0.603	0.801	0.415	0.321	0.325	0.952	0.345	0.481	0.193
HU12	Pest	0.298	0.205	0.229	0.333	0.404	0.097	0.273	0.284	0.402	0.587	0.447	0.219	0.406	0.330	0.415	0.337	0.465	0.731	0.198	0.550	0.261
HU21	Közép-Dunántúl	0.218	0.153	0.278	0.310	0.404	0.124	0.409	0.379	0.551	0.202	0.322	0.134	0.333	0.289	0.310	0.110	0.144	0.927	0.152	0.446	0.342
HU22	Nyugat-Dunántúl	0.208	0.156	0.212	0.331	0.384	0.124	0.201	0.319	0.335	0.218	0.335	0.137	0.355	0.217	0.301	0.114	0.185	0.882	0.150	0.671	0.363
HU23	Dél-Dunántúl	0.220	0.142	0.380	0.223	0.384	0.152	0.151	0.313	0.351	0.112	0.375	0.147	0.340	0.426	0.224	0.186	0.175	0.404	0.126	0.418	0.287
HU31	Észak-Magyarország	0.165	0.168	0.259	0.174	0.358	0.083	0.169	0.399	0.405	0.149	0.325	0.107	0.400	0.254	0.273	0.137	0.227	0.686	0.202	0.435	0.181
HU32	Észak-Alföld	0.253	0.309	0.412	0.356	0.364	0.283	0.194	0.379	0.369	0.151	0.268	0.061	0.229	0.368	0.273	0.130	0.285	0.359	0.045	0.389	0.284
HU33	Dél-Alföld	0.270	0.201	0.431	0.205	0.358	0.332	0.244	0.506	0.471	0.129	0.364	0.151	0.337	0.467	0.380	0.154	0.231	0.389	0.171	0.410	0.288
MT	Malta																					
NL	Netherlands																					
NL11	Groningen	0.726	0.830	1.000	0.826	0.899	0.484	0.316	0.237	0.610	0.528	0.569	0.628	0.613	1.000	0.474	0.312	0.299	0.565	0.585	0.501	0.595
NL12	Friesland	0.602	0.696	0.265	0.861	0.945	0.484	0.316	0.237	0.610	0.345	0.569	0.628	0.613	0.338	0.423	0.308	0.228	0.440	0.585	0.501	0.605
NL13	Drenthe	0.438	0.633	0.371	0.365	0.933	0.484	0.316	0.237	0.610	0.381	0.569	0.628	0.613	0.426	0.428	0.260	0.456	0.465	0.585	0.501	0.589
NL21	Overijssel	0.652	0.652	0.683	0.772	0.933	0.484	0.517	0.237	0.610	0.518	0.569	0.628	0.613	0.723	0.534	0.403	0.498	0.550	0.585	0.501	0.560
NL22	Gelderland	0.709	0.719	0.952	0.888	0.956	0.484	0.517	0.237	0.610	0.659	0.569	0.628	0.613	0.883	0.533	0.530	0.621	0.540	0.585	0.501	0.565
NL23	Flevoland	0.408	0.674	0.265	0.729	0.968	0.484	0.517	0.237	0.610	0.968	0.569	0.628	0.613	0.394	0.463	0.687	0.452	0.600	0.585	0.501	0.593
NL31	Utrecht	1.000	0.853	1.000	0.935	0.956	0.484	0.434	0.237	0.610	1.000	0.569	0.628	0.613	1.000	0.484	0.455	0.561	0.706	0.585	0.501	0.569
NL32	Noord-Holland	1.000	0.767	0.979	0.911	0.956	0.484	0.434	0.237	0.610	1.000	0.569	0.628	0.613	0.904	0.452	0.721	0.489	0.766	0.585	0.501	0.576
NL33	Zuid-Holland	0.771	0.763	0.940	0.876	0.956	0.484	0.434	0.237	0.610	0.735	0.569	0.628	0.613	0.937	0.636	0.476	0.478	0.641	0.585	0.501	0.569
NL34	Zeeland	0.469	0.607	0.206	0.788	0.968	0.484	0.434	0.237	0.610	0.250	0.569	0.628	0.613	0.243	0.515	0.273	0.319	0.450	0.585	0.501	0.563
NL41	Noord-Brabant	0.794	0.659	0.609	0.753	0.956	0.484	0.811	0.237	0.610	0.647	0.569	0.628	0.613	0.744	1.000	0.575	0.963	0.676	0.585	0.501	0.552

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NL42	Limburg	0.645	0.622	0.934	0.803	0.968	0.484	0.811	0.237	0.610	0.408	0.569	0.628	0.613	0.829	0.855	0.509	0.533	0.555	0.585	0.501	0.593
AT	Austria																					
AT1	Ostösterreich	0.723	0.603	0.871	0.645	0.727	0.801	0.574	0.287	0.696	0.806	0.730	0.891	0.690	0.855	0.602	0.787	0.463	0.600	0.794	0.925	0.411
AT2	Südösterreich	0.600	0.506	0.738	0.561	0.668	0.691	1.000	0.363	0.605	0.410	0.640	0.922	0.707	0.950	0.776	0.617	0.663	0.606	0.764	0.675	0.517
AT3	Westösterreich	0.519	0.503	0.632	0.536	0.717	0.442	0.822	0.354	0.607	0.351	0.723	0.987	0.655	0.665	0.793	0.786	0.944	0.585	0.826	0.729	0.594
PL	Poland																					
PL21	Malopolskie	0.714	0.201	0.523	0.282	0.300	0.491	0.506	0.444	0.479	0.486	0.223	0.160	0.226	0.416	0.353	0.355	0.817	0.495	0.238	0.358	0.000
PL22	Slaskie	0.645	0.186	0.316	0.181	0.300	0.124	0.179	0.280	0.297	0.327	0.250	0.130	0.181	0.304	0.209	0.214	0.592	0.600	0.117	0.298	0.000
PL41	Wielkopolskie	0.590	0.142	0.381	0.274	0.294	0.242	0.136	0.268	0.279	0.255	0.196	0.098	0.135	0.316	0.163	0.317	0.866	0.404	0.122	0.311	0.137
PL42	Zachodniopomarski	0.545	0.119	0.302	0.257	0.294	0.207	0.086	0.259	0.261	0.246	0.195	0.147	0.117	0.293	0.149	0.207	0.561	0.404	0.098	0.253	0.359
PL43	Lubuskie	0.434	0.112	0.259	0.295	0.294	0.062	0.133	0.366	0.391	0.175	0.197	0.098	0.169	0.230	0.098	0.267	0.730	0.424	0.080	0.292	0.283
PL51	Dolnoslaskie	0.839	0.227	0.456	0.251	0.312	0.269	0.244	0.308	0.347	0.580	0.266	0.157	0.152	0.387	0.264	0.234	0.479	0.761	0.157	0.436	0.187
PL52	Opolskie	0.529	0.115	0.257	0.247	0.312	0.090	0.169	0.301	0.436	0.475	0.220	0.153	0.136	0.248	0.190	0.227	0.444	0.394	0.235	0.220	0.093
PL61	Kujawsko-Pomorskie	0.441	0.194	0.331	0.161	0.306	0.124	0.154	0.357	0.362	0.277	0.244	0.168	0.155	0.260	0.162	0.190	0.637	0.294	0.159	0.490	0.126
PL62	Warminsko-Mazurskie	0.358	0.119	0.281	0.226	0.306	0.193	0.086	0.413	0.340	0.155	0.180	0.029	0.146	0.257	0.143	0.134	0.684	0.138	0.046	0.366	0.221
PL63	Pomorskie	0.704	0.220	0.403	0.294	0.306	0.214	0.384	0.244	0.324	0.438	0.255	0.244	0.208	0.365	0.237	0.400	0.559	0.545	0.196	0.325	0.348
PL71	Lódzkie	0.635	0.112	0.379	0.239	0.294	0.301	0.172	0.290	0.428	0.312	0.183	0.065	0.110	0.337	0.214	0.342	0.620	0.465	0.111	0.354	0.027
PL72	Swietokrzyskie	0.567	0.097	0.218	0.128	0.294	0.100	0.144	0.261	0.249	0.111	0.166	0.017	0.119	0.182	0.204	0.139	0.759	0.218	0.154	0.328	0.164
PL81	Lubelskie	0.642	0.205	0.378	0.279	0.294	0.419	0.129	0.413	0.373	0.162	0.241	0.216	0.196	0.314	0.197	0.182	0.463	0.188	0.153	0.340	0.220
PL82	Podkarpackie	0.669	0.089	0.251	0.261	0.294	0.114	0.330	0.464	0.393	0.261	0.281	0.125	0.257	0.224	0.239	0.348	0.693	0.480	0.248	0.303	0.142
PL84	Podlaskie	0.664	0.160	0.341	0.328	0.294	0.267	0.104	0.315	0.286	0.146	0.180	0.167	0.161	0.252	0.207	0.188	0.501	0.158	0.164	0.387	0.321
PL91	Warszawski stoleczny	1.000	0.395	0.724	0.223	0.312	0.467	0.624	0.252	0.511	1.000	0.311	0.294	0.303	0.599	0.232	0.586	0.546	0.937	0.225	0.372	0.078
PL92	Mazowiecki regionalny	0.571	0.089	0.118	0.068	0.312	0.037	0.133	0.370	0.368	0.047	0.246	0.146	0.119	0.104	0.232	0.133	0.333	0.248	0.061	0.205	0.175
PT	Portugal																					
PT11	Norte	0.512	0.331	0.671	0.509	0.512	0.470	0.298	0.357	0.320	0.312	0.543	0.423	0.261	0.469	0.380	0.638	0.829	0.374	0.385	0.705	0.771
PT15	Algarve	0.362	0.309	0.558	0.416	0.540	0.180	0.022	0.248	0.204	0.456	0.482	0.489	0.110	0.474	0.273	0.265	0.290	0.078	0.291	0.370	0.810
PT16	Centro	0.574	0.406	0.686	0.525	0.512	0.408	0.244	0.366	0.407	0.297	0.632	0.506	0.457	0.475	0.316	0.409	0.407	0.269	0.520	0.664	0.806
PT17	Lisboa	0.638	0.503	0.805	0.485	0.623	0.518	0.294	0.276	0.455	0.954	0.624	0.512	0.365	0.579	0.287	0.524	0.323	0.681	0.452	0.717	0.627
PT18	Alentejo	0.336	0.376	0.407	0.333	0.493	0.180	0.140	0.342	0.453	0.456	0.588	0.469	0.399	0.274	0.249	0.477	0.172	0.203	0.419	0.751	0.839

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PT2	Região Autónoma dos Açores	0.042	0.190	0.470	0.439	0.595	0.173	0.014	0.146	0.132	0.456	0.353	0.241	0.302	0.338	0.054	0.178	0.159	0.027	0.184	1.000	n/a
PT3	Região Autónoma da Madeira	0.438	0.331	0.478	0.292	0.595	0.166	0.043	0.220	0.249	0.456	0.540	0.433	0.187	0.323	0.096	0.574	0.241	0.007	0.345	0.382	n/a
RO	Romania																					
RO11	Nord-Vest	0.282	0.022	0.383	0.303	0.060	0.090	0.025	0.105	0.138	0.119	0.343	0.000	0.076	0.295	0.130	0.174	0.311	0.324	0.000	0.443	0.372
RO12	Centru	0.146	0.041	0.265	0.241	0.046	0.007	0.100	0.079	0.093	0.139	0.146	0.000	0.051	0.253	0.168	0.111	0.213	0.550	0.000	0.342	0.379
RO21	Nord-Est	0.044	0.034	0.267	0.253	0.038	0.097	0.014	0.062	0.100	0.156	0.186	0.000	0.047	0.205	0.106	0.130	0.265	0.032	0.000	0.349	0.268
RO22	Sud-Est	0.071	0.026	0.153	0.032	0.038	0.041	0.000	0.090	0.099	0.061	0.092	0.000	0.084	0.140	0.094	0.047	0.206	0.324	0.000	0.242	0.373
RO31	Sud - Muntenia	0.044	0.112	0.090	0.217	0.043	0.014	0.104	0.013	0.004	0.056	0.065	0.000	0.040	0.108	0.109	0.072	0.127	0.510	0.000	0.271	0.294
RO32	Bucuresti - Ilfov	0.889	0.037	0.586	0.183	0.076	0.325	0.240	0.087	0.268	1.000	0.247	0.134	0.313	0.520	0.137	0.281	0.400	0.877	0.018	0.447	0.183
RO41	Sud-Vest Oltenia	0.090	0.026	0.189	0.160	0.054	0.069	0.043	0.000	0.096	0.075	0.028	0.000	0.019	0.180	0.111	0.048	0.181	0.208	0.000	0.348	0.205
RO42	Vest	0.177	0.074	0.295	0.316	0.065	0.062	0.111	0.092	0.075	0.171	0.025	0.000	0.042	0.207	0.228	0.116	0.188	1.000	0.000	0.262	0.353
SI	Slovenia																					
SI03	Vzhodna Slovenija	0.597	0.387	0.394	0.553	0.511	0.062	0.499	0.172	0.503	0.312	0.700	0.492	0.502	0.386	0.755	0.355	0.348	0.751	0.559	0.704	0.388
SI04	Zahodna Slovenija	0.775	0.447	0.923	0.395	0.550	0.532	0.535	0.160	0.503	0.700	0.816	0.576	0.633	0.867	0.378	0.651	0.480	0.807	0.559	0.539	0.390
SK	Slovakia																					
SK01	Bratislavský kraj	1.000	0.261	0.911	0.195	0.459	0.525	0.226	0.301	0.557	1.000	0.334	0.323	0.546	0.713	0.262	0.416	0.377	0.958	0.301	0.579	0.333
SK02	Západné Slovensko	0.517	0.097	0.341	0.292	0.444	0.097	0.187	0.440	0.416	0.257	0.239	0.186	0.283	0.272	0.251	0.195	0.350	0.947	0.217	0.370	0.319
SK03	Stredné Slovensko	0.457	0.149	0.386	0.281	0.421	0.180	0.118	0.532	0.480	0.315	0.332	0.244	0.307	0.271	0.245	0.215	0.328	0.611	0.279	0.555	0.247
SK04	Vachon Slovensko	0.519	0.115	0.464	0.259	0.444	0.152	0.083	0.445	0.341	0.429	0.223	0.211	0.282	0.297	0.249	0.198	0.240	0.505	0.298	0.617	0.231
FI	Finland																					
FI1B	Helsinki-Uusimaa	0.809	1.000	1.000	0.713	0.981	0.746	0.840	0.399	0.996	1.000	0.832	0.840	1.000	1.000	1.000	0.927	0.631	0.993	0.827	0.794	0.786
FI1C	Helsinki-Uusimaa	0.545	0.994	0.814	0.628	0.968	0.477	0.362	0.391	0.604	0.535	0.674	0.685	1.000	0.709	0.724	0.459	0.582	0.580	0.754	0.628	0.855
FI19	Etelä-Suomi	0.564	1.000	0.741	0.701	0.944	0.518	0.628	0.386	0.715	0.741	0.789	0.822	1.000	0.727	0.975	0.438	0.569	0.600	0.898	0.942	0.908
FI1D	Pohjois-ja Länsi-Suomi	0.505	0.983	0.778	0.669	0.932	0.649	0.574	0.474	0.794	0.420	0.641	0.677	1.000	0.726	0.767	0.373	0.384	0.384	0.743	0.755	0.929
FI2	Åland	n/a	0.998	0.094	0.687	0.956	0.622	0.649	0.403	n/a	0.915	0.763	0.504	1.000	0.000	0.448	0.452	0.346	0.590	n/a	0.800	0.954
SE	Sweden																					
SE11	Stockholm	1.000	1.000	1.000	0.795	0.844	0.663	0.976	0.422	0.885	1.000	1.000	0.878	0.689	1.000	1.000	0.956	0.565	1.000	0.847	0.703	0.877
SE12	Östra Mellansverige	0.759	1.000	1.000	0.705	0.866	1.000	0.718	0.335	0.597	0.685	0.724	0.806	0.646	0.956	1.000	0.355	0.457	0.751	0.753	0.535	0.905
SE21	Småland med öarna	0.585	1.000	0.491	0.478	0.899	0.152	0.495	0.509	0.533	0.429	0.889	0.763	0.712	0.355	0.767	0.443	0.686	0.485	0.826	0.617	0.823
SE22	Sydsverige	0.816	1.000	0.946	0.650	0.855	0.795	0.721	0.424	0.882	0.802	0.980	0.833	0.700	0.837	1.000	0.725	0.720	0.661	0.870	0.673	0.724

		Population with tertiary education	Life-long 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
SE23	Västsverige	0.771	1.000	0.864	0.828	0.877	0.573	1.000	0.432	0.615	0.628	0.935	0.766	0.574	1.000	0.982	0.632	0.541	0.867	0.782	0.654	0.818
SE31	Norra Mellansverige	0.543	1.000	0.428	0.549	0.844	0.145	0.334	0.368	0.520	0.405	0.684	0.698	0.606	0.462	0.705	0.419	0.468	0.460	0.716	0.504	0.940
SE32	Mellersta Norrland	0.462	1.000	0.399	0.523	0.888	0.187	0.219	0.463	0.595	0.707	0.749	0.602	0.591	0.397	0.691	0.230	0.355	0.465	0.733	0.618	0.969
SE33	Övre Norrland	0.614	1.000	1.000	0.589	0.877	1.000	0.183	0.498	0.606	0.492	0.804	0.622	0.625	0.897	0.801	0.277	0.328	0.419	0.647	0.716	0.969
NO	Norway																					
NO01	Oslo og Akershus	1.000	0.793	1.000	0.721	0.991	1.000	0.549	0.467	0.917	1.000	1.000	0.930	1.000	1.000	0.566	0.359	0.354	0.771	0.853	0.599	0.684
NO02	Hedmark og Oppland	0.519	0.652	0.552	0.372	1.000	0.263	0.172	0.524	0.687	0.306	0.990	0.875	1.000	0.488	0.318	0.102	0.146	0.233	0.846	0.547	0.933
NO03	Sør-Østlandet	0.666	0.644	0.453	0.571	1.000	0.228	0.452	0.535	0.761	0.332	0.967	0.906	1.000	0.461	0.599	0.194	0.202	0.460	0.870	0.647	0.840
NO04	Agder og Rogaland	0.593	0.726	0.648	0.605	0.991	0.283	0.366	0.483	0.697	0.398	0.902	0.853	1.000	0.654	0.864	0.188	0.165	0.465	0.850	0.578	0.849
NO05	Vestlandet	0.697	0.700	1.000	0.779	0.979	0.891	0.330	0.434	0.697	0.332	0.925	0.859	1.000	0.832	0.650	0.144	0.253	0.485	0.853	0.559	0.927
NO06	Trøndelag	0.842	0.726	1.000	0.644	0.919	1.000	0.940	0.575	0.771	0.529	1.000	1.000	1.000	1.000	0.923	0.121	0.098	0.490	0.895	0.616	0.904
NO07	Nord-Norge	0.567	0.719	1.000	0.571	0.979	0.967	0.190	0.430	0.574	0.180	0.660	0.651	1.000	0.787	0.339	0.083	0.048	0.284	0.724	0.703	0.945
CH	Switzerland																					
CH01	Région lémanique	0.913	1.000	1.000	0.829	0.945	0.629	0.811	n/a	n/a	0.602	0.564	0.523	0.227	1.000	0.903	0.778	0.557	0.686	n/a	n/a	0.705
CH02	Espace Mittelland	0.756	1.000	0.916	0.717	0.910	0.629	0.811	n/a	n/a	0.655	0.657	0.979	0.348	0.846	0.742	0.457	0.464	0.676	n/a	n/a	0.711
CH03	Nordwestschweiz	0.842	1.000	1.000	0.823	0.957	0.629	0.811	n/a	n/a	0.540	0.583	0.720	0.190	1.000	1.000	0.834	0.680	0.852	n/a	n/a	0.639
CH04	Zürich	1.000	1.000	1.000	0.968	0.945	0.629	0.811	n/a	n/a	1.000	0.787	0.945	0.452	1.000	0.874	0.570	0.276	1.000	n/a	n/a	0.632
CH05	Ostschweiz	0.702	1.000	0.557	0.648	0.945	0.629	0.811	n/a	n/a	0.541	0.876	0.950	0.622	0.598	0.837	0.563	1.000	0.706	n/a	n/a	0.706
CH06	Zentralschweiz	0.868	1.000	0.502	0.547	0.945	0.629	0.811	n/a	n/a	0.686	0.679	0.796	0.482	0.644	0.798	1.000	1.000	0.802	n/a	n/a	0.708
CH07	Ticino	0.951	0.920	0.929	0.749	0.899	0.629	0.811	n/a	n/a	0.487	0.998	1.000	0.503	0.839	0.751	1.000	0.849	0.611	n/a	n/a	0.608
RS	Serbia																					
RS11	Belgrade	0.763	0.227	0.668	0.185	0.335	0.622	0.212	0.830	0.808	0.781	1.000	0.755	0.762	0.472	0.212	0.052	0.196	0.666	0.760	0.624	0.000
RS12	Vojvodina	0.346	0.160	0.362	0.231	0.289	0.325	0.147	1.000	0.954	0.222	0.807	0.600	0.356	0.282	0.212	0.064	0.000	0.430	0.576	0.526	0.044
RS21	Šumadija and Western Serbia	0.301	0.127	0.211	0.196	0.249	0.069	0.004	1.000	1.000	0.097	0.839	0.698	0.373	0.157	0.212	0.051	0.114	0.148	0.715	0.656	0.000
RS22	Southern and Eastern Serbia	0.277	0.123	0.257	0.214	0.226	0.152	0.018	1.000	1.000	0.096	0.819	0.622	0.380	0.149	0.212	0.072	0.194	0.339	0.508	0.649	0.000
UK	United Kingdom																					
UKC	North East	0.495	0.499	0.757	0.769	0.876	0.325	0.258	0.657	0.775	0.478	0.461	0.150	0.898	0.627	0.620	0.135	0.308	0.470	0.759	0.657	0.716

		Population with tertiary education	Life-long 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
UKD	North West	0.714	0.521	0.720	0.780	0.922	0.297	0.355	0.637	0.775	0.552	0.459	0.155	0.892	0.657	0.494	0.178	0.287	0.560	0.759	0.521	0.668
UKE	Yorkshire and The Humber	0.548	0.544	0.711	0.795	0.922	0.345	0.237	0.658	0.775	0.502	0.511	0.122	0.998	0.660	0.513	0.234	0.454	0.475	0.759	0.430	0.635
UKF	East Midlands	0.588	0.551	0.700	0.724	0.899	0.228	0.520	0.606	0.775	0.442	0.574	0.177	0.931	0.641	0.488	0.266	0.409	0.535	0.759	0.814	0.650
UKG	West Midlands	0.659	0.499	0.645	0.744	0.957	0.221	0.621	0.647	0.775	0.471	0.605	0.149	1.000	0.547	0.563	0.251	0.561	0.616	0.759	0.694	0.662
UKH	East of England	0.678	0.503	0.802	0.961	0.945	0.435	0.997	0.267	0.775	0.803	0.614	0.195	1.000	0.847	0.775	0.314	0.458	0.676	0.759	0.188	0.635
UKI	London	1.000	0.596	1.000	0.917	0.957	0.345	0.205	0.420	0.775	1.000	0.429	0.156	0.847	0.866	0.467	0.638	0.542	0.952	0.759	0.394	0.622
UKJ	South East	0.818	0.588	0.830	0.838	0.968	0.415	0.581	0.543	0.775	1.000	0.626	0.173	1.000	0.779	0.682	0.347	0.456	0.837	0.759	0.699	0.651
UKK	South West	0.740	0.637	0.685	0.838	0.934	0.304	0.402	0.632	0.775	0.564	0.523	0.171	1.000	0.617	0.625	0.305	0.524	0.585	0.759	0.719	0.679
UKL	Wales	0.616	0.585	0.675	0.670	0.899	0.269	0.212	1.000	0.775	0.361	0.491	0.186	0.919	0.617	0.547	0.177	0.322	0.379	0.759	0.797	0.699
UKM	Scotland	0.998	0.547	0.876	0.791	0.911	0.553	0.305	0.606	0.775	0.431	0.486	0.166	1.000	0.753	0.546	0.210	0.256	0.409	0.759	0.540	0.840
UKN	Northern Ireland	0.780	0.406	0.628	0.692	0.911	0.263	0.398	0.617	0.775	0.431	0.467	0.170	0.780	0.498	0.439	0.286	0.274	0.515	0.759	0.347	0.714

Annex 4: Regional profiles

This annex shows an example of a regional profile. Profiles for all regions are available on the RIS website: http://ec.europa.eu/growth/industry/innovation/facts-figures/regional_en

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

	Data	Nor-	Relative to	
			BE	EU
Tertiary education	53.8	0.915	120	160
Lifelong learning	10.7	0.398	130	99
International scientific co-publications	5225	1.000	133	178
Most-cited scientific publications	11.6	0.652	90	120
Above average digital skills	33.6	0.586	99	111
R&D expenditures public sector	0.77	0.518	97	107
R&D expenditures business sector	1.22	0.438	65	84
Non-R&D innovation expenditures	±	0.524	±	±
Innovation expenditures per employee	±	1.000	±	±
Employed ICT specialists	7.4	1.000	152	200
Product innovators	±	0.689	±	±
Business process innovators	±	0.891	±	±
Innovative SMEs collaborating	±	1.000	±	±
Public-private co-publications	799.4	1.000	153	202
PCT patent applications	1.70	0.436	74	70
Trademark applications	7.25	0.534	117	117
Design applications	1.86	0.392	82	68
Employment knowledge-intensive activities	17.2	0.681	113	114
Employment innovative enterprises	±	0.836	±	±
Sales of innovative products	±	0.965	±	±
Air emissions by fine particulates	13.1	0.521	97	106
Average score	--	0.713	--	--
Country EIS-RIS correction factor	--	1.018	--	--
Regional Innovation Index 2021	--	0.726	--	--
RII 2021 (same year)	--	--	106.3	135.1
RII 2021 (cf. to EU 2014)	--	--	--	155.2
Regional Innovation Index 2014	--	0.610	--	--
RII 2014 (same year)	--	--	104.3	130.3
RII - change between 2014 and 2021	--	24.9	--	--

± Relative-to-EU scores are not shown as these would allow recalculating confidential regional CIS data.

Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1) is an **Innovation Leader**.

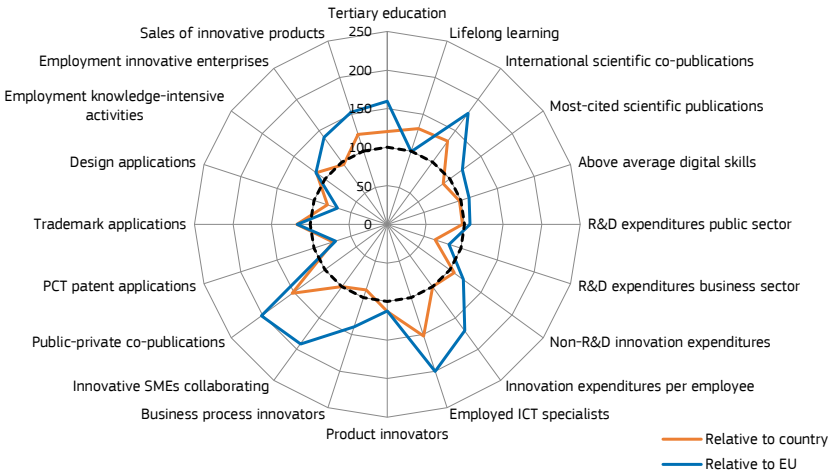
Innovation performance has increased over time (24.9%).

The table on the left shows the normalised scores per indicator and relative results compared to Belgium and the EU. The table also shows the Regional Innovation Index (RII) in 2021 compared to that of Belgium and the EU in 2021, the RII in 2021 compared to that of the EU in 2014, and performance change over time between 2014 and 2021.

The radar graph shows relative strengths compared to Belgium (orange line) and the EU (blue line), showing relative strengths (e.g. Public-private co-publications) and weaknesses (e.g. Design applications).

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

	BE1	BE	EU
Share of employment in:			
Agriculture & Mining (A-B)	n/a	1.0	4.6
Manufacturing (C)	4.7	12.5	16.4
Utilities & Construction (D-F)	7.2	8.2	8.2
Services (G-N)	73.1	69.0	62.9
Public administration (O-U)	14.8	9.3	7.1
Average employed persons per enterprise (firm size)	n/a	4.4	5.2
GDP per capita (PPS)	63,000	36,700	31,200
GDP per capita growth (PPS)	1.44	2.54	3.21
Population density	7527	377	109
Urbanisation	100.00	86.9	75.3
Population size (000s)	1,220	11,520	446,450



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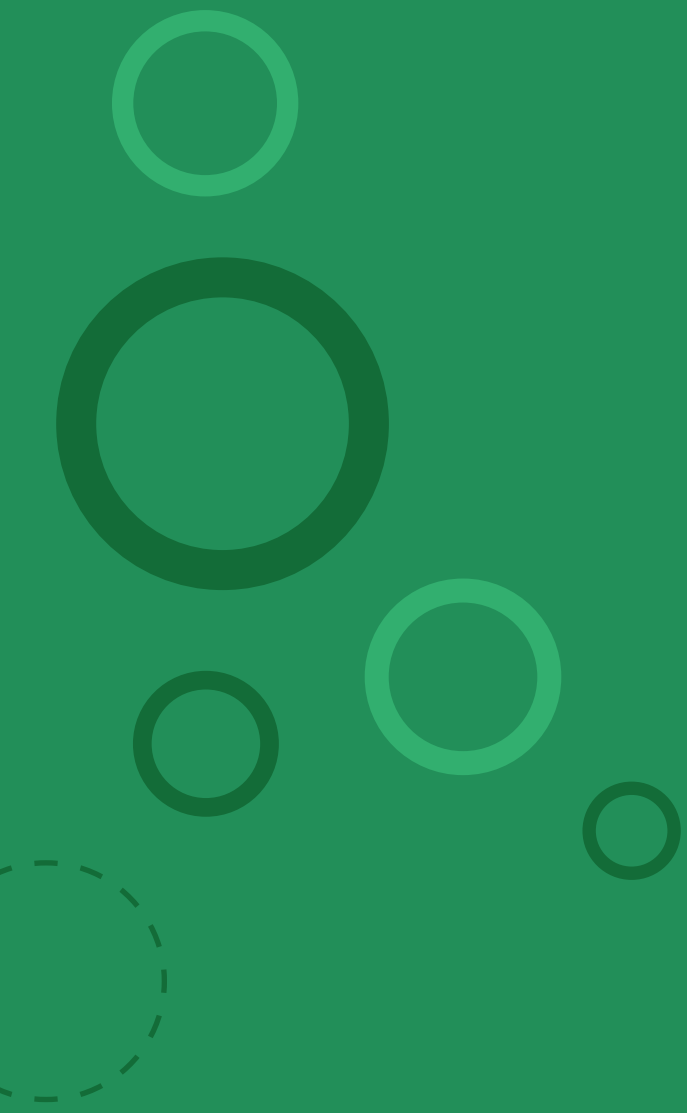
Regional **Innovation Scoreboard** 2021



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