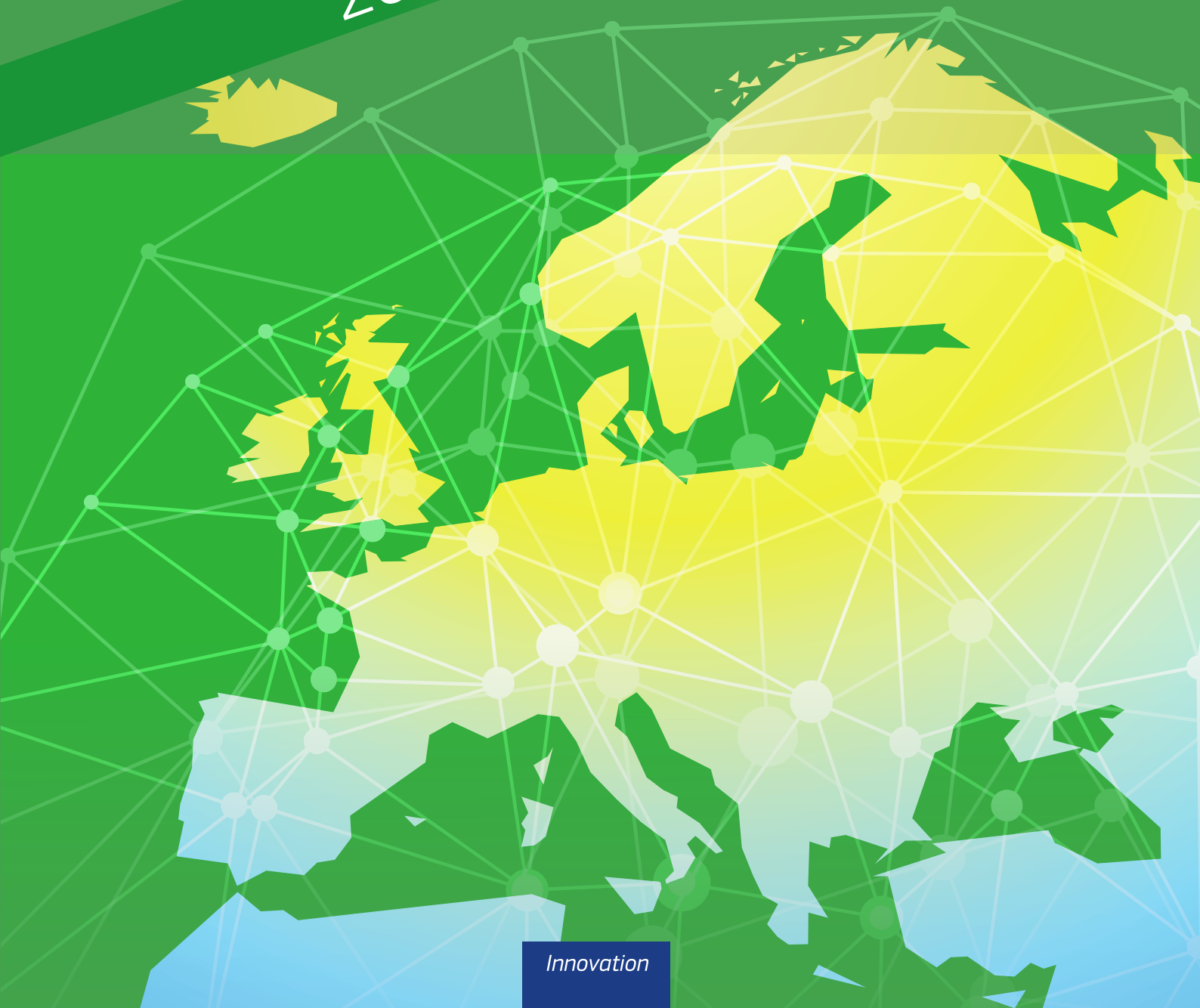
European Commission

Regional Innovation Scoreboard 2019



Innovation

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The Regional Innovation Scoreboard report, executive summaries in 23 languages, an accompanying methodology report, as well as regional profiles for all regions are available at: https://ec.europa.eu/growth/industry/innovation/facts-figures/regional_en

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Regional **Innovation** Scoreboard 2019

TABLE OF CONTENTS

Executive summary

This 9th edition of the Regional Innovation Scoreboard (RIS) provides a comparative assessment of performance of innovation systems across 238 regions of 23 EU Member States, Norway, Serbia, and Switzerland. In addition, 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. Where 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

Similar to the EIS, where countries are classified into four innovation performance groups, Europe's regions have been classified into similar groups of regional Innovation Leaders (38 regions), regional Strong Innovators (73 regions), regional Moderate Innovators (97 regions), and regional Modest Innovators (30 regions). A more detailed breakdown of these performance groups is obtained by splitting each group into a top one-third (assigned with a '+'), middle one-third, and bottom one-third (assigned with a '-') regions (shown on the map below). The most innovative regions will be 'Innovation Leaders +', and the least innovative regions will be 'Modest – Innovators'. Five countries have regions in more than two different performance groups, and 13 countries have regions in four or more different performance sub-groups.

The most innovative regions are typically in the most innovative countries

The Innovation Leaders perform well on all indicators, in particular on those indicators measuring the performance of their research system and business innovation. All Regional Innovation Leaders belong to countries identified as Innovation Leaders or as Strong Innovators in the European Innovation Scoreboard, and almost all Regional Moderate and Modest Innovators belong to countries identified as Moderate and Modest Innovators in the European Innovation Scoreboard. However, regional 'pockets of excellence' can be identified in some Moderate Innovator countries (for instance, *Praha (Prague)* in Czechia, *Kriti (Crete)* in Greece, and *Friuli-Venezia Giulia* in Italy).

Rank results revealed: Helsinki-Uusimaa most innovative region in the EU

The most innovative region in Europe is *Zürich* in Switzerland, followed by *Ticino* (Switzerland). *Helsinki-Uusimaa* (Finland) is the most innovative region in the EU and can be found in third place overall, followed by *Stockholm* (Sweden) ranked fourth and *Hovedstaden* (Denmark) in fifth place.

For most regions, innovation performance has improved over time

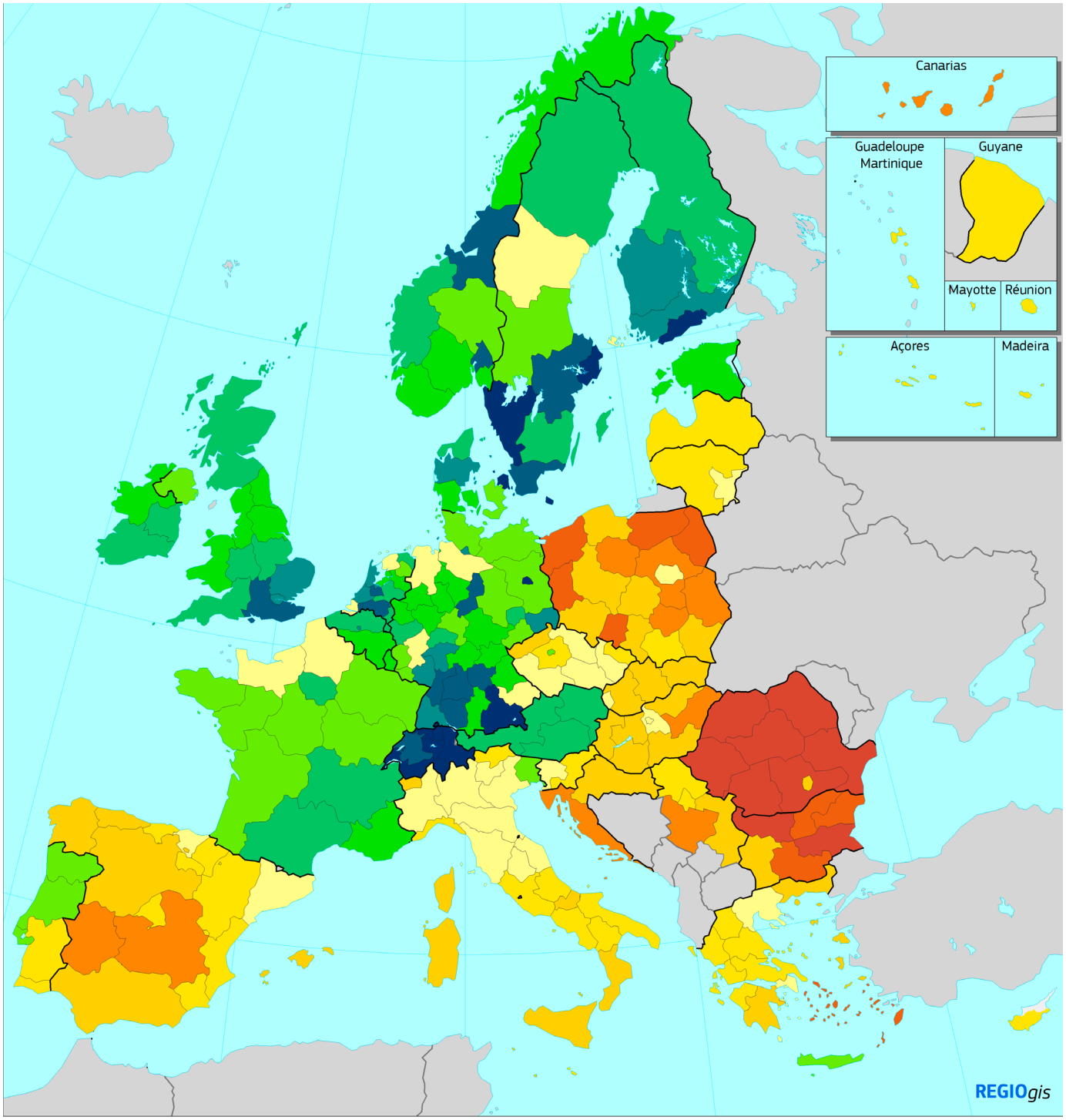
Innovation performance has shown a net improvement in 159 regions during the nine-year observation period in the RIS. The share of regions with positive performance change is highest for the Moderate Innovators (80%) and lowest for the Modest Innovators (45%). Performance has increased for all regions in Austria, Belgium, Finland, Italy, Lithuania, the Netherlands, Norway, Portugal, Serbia and the United Kingdom. Performance has decreased for 79 regions including all regions in Romania and Slovenia, and for most regions in Bulgaria, Denmark, Germany and Switzerland.

Steady performance among top regions and convergence of others

Over time, there has been a process of convergence in regional performance with decreasing performance differences between regions, in particular due to declining performance gaps between the Innovation Leaders, Strong Innovators and Moderate Innovators, but with increasing performance gaps for the Modest Innovators. There have been relatively few fluctuations in the top-25 best performing regions since 2011, with 17 regions consistently being in this group during the period. Of the top-25 regions in 2019, seven regions come from each of Switzerland and Germany, four from Sweden, two each from the Netherlands and Norway, and one each from Denmark, Finland and the United Kingdom.

RIS methodology

The RIS 2019 replicates the EIS methodology used at national level to measure performance of regional systems of innovation. The RIS 2019 uses data for 238 regions across Europe for 17 of the 27 indicators used in the EIS 2019. Compared to the RIS 2017, the number of indicators has decreased as no recent regional data for the share of medium and high-tech product exports are available. Data are available for 2017 for six indicators, 2016 for 10 indicators and 2015 for one indicator. Regional coverage has improved for Bulgaria (from 2 to 6 regions) as NUTS 2 data have become available for more indicators. A revision of the NUTS classification has also changed the number of regions for France (from 9 to 14), Hungary (from 7 to 8), Ireland (from 2 to 3), Lithuania (from 0 to 2) and Poland (from 16 to 17).



Regional performance groups

- Modest -
- Modest
- Modest +
- Moderate -
- Moderate
- Moderate +
- Strong -
- Strong
- Strong +
- Leader -
- Leader
- Leader +

Source: European Commission - Regional Innovation Scoreboard 2019

For Cyprus, Estonia, Latvia, Luxembourg and Malta, performance group membership is identical to that in the EIS 2019 report. For these countries, the corresponding colour codes for middle one-third regions have been used.

1. Introduction

The 2019 Regional Innovation Scoreboard (RIS) is a regional extension of the 2019 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 27 indicators. These indicators are grouped into four main types – Framework conditions, Investments, Innovation activities, and Impacts – and 10 innovation dimensions. The EIS measurement framework is presented in **Table 1**.

Table 1: Measurement framework of the 2019 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
Innovation-friendly environment
1.3.1 Broadband penetration
1.3.2 Opportunity-driven entrepreneurship
INVESTMENTS
Finance and support
2.1.1 R&D expenditure in the public sector
2.1.2 Venture capital expenditures
Firm investments
2.2.1 R&D expenditure in the business sector
2.2.2 Non-R&D innovation expenditures
2.2.3 Enterprises providing training to develop or upgrade ICT skills of their personnel
INNOVATION ACTIVITIES
Innovators
3.1.1 SMEs with product or process innovations
3.1.2 SMEs with marketing or organisational innovations
3.1.3 SMEs innovating in-house
Linkages
3.2.1 Innovative SMEs collaborating with others
3.2.2 Public-private co-publications
3.2.3 Private co-funding of public R&D expenditures
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 fast-growing enterprises of innovative sectors
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-firm innovations

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

The RIS addresses this gap and provides statistical facts on regions' innovation performance. Regional innovation performance is measured using a composite indicator – the Regional Innovation Index (RII) – which summarizes the performance on 17 indicators. The RIS 2019 implements the measurement framework of the EIS 2017. Compared to the RIS 2017, regional data availability has decreased as regional data for the indicator measuring the share of medium and high-tech products exports have become too old and the indicator is therefore no longer used.

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 2019. 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 238 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, i.e. RIS 2017, RIS 2016, RIS 2014, RIS 2012, RIS 2009 and RIS 2006. For the RIS 2019, most recent data refer to 2017 for six indicators, 2016 for 10 indicators, and 2015 for one indicator. A reference to the most recent performance year (RII2019) in this report should thus be interpreted as referring to data about three years older than the 2019 reference year.

[1] Annex 6 in the RIS 2014 report provides a more detailed discussion of regional systems of innovation: https://publications.europa.eu/en/publication-detail/-/publication/69a64699-18d7-40b9-8f92-1db3226cd2ec/language-en/format-PDF/source-97833730

2. RIS indicators, regions and data availability

This chapter discusses the indicators used in the Regional Innovation Scoreboard 2019 (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), i.e. 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 17 of the 27 indicators used in the EIS (**Table 2**). For several indicators, slightly different definitions have been applied, as regional data would not be available if the definitions were the same as in the EIS:

- For Population with completed tertiary education, the RIS uses data for the age group 30-34. The indicator in the EIS covers the broader age group 25-34. Tabulated regional data for this age group are not available from Eurostat, so the same age group is used as in the RIS 2017;
- For two indicators using data from the Community Innovation Survey (CIS) – Non-R&D innovation expenditures and Sales of new-to-market and new-to-firm innovations – the data refer only to SMEs and not to all companies;[2]
- For PCT patent applications, regional data have been extracted from the OECD's REGPAT database;
- For Trademark applications, only EU trademark applications have been used, for which the data have been calculated by Science Metrix. The EIS uses the aggregate of both EUIPO and WIPO (Madrid Protocol) applications, but regional data for the latter are not available;
- 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. Data for regional design applications have been calculated by Science Metrix;
- 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.

The indicators are explained in more detail in **Annex 1**.

[2] Regional Community Innovation Survey (CIS) data are not publicly available and have been made available explicitly for the Regional Innovation Scoreboard by national statistical offices. The CIS assigns the innovation activities of multi-establishment enterprises to the region where the head office is located. There is a risk that regions without head offices score lower on the CIS indicators, as some of the activities in these regions are assigned to those 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 2019 Methodology Report.

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

	EIS 2019	RIS 2019
FRAMEWORK CONDITIONS		
Human resources	*Doctorate graduates per 1000 population aged 25-34*	*No regional data*
	Percentage of population aged 25-34 having completed tertiary education	Smaller age group 30-34
	Life-long 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*
Innovation-friendly environment	*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*
	Opportunity-driven entrepreneurship	*No regional data*
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*
Firm investments	R&D expenditure in the business sector as percentage of GDP	Identical
	Non-R&D innovation expenditures as percentage of total turnover	For SMEs only
	Enterprises providing training to develop or upgrade ICT skills of their personnel	*No regional data*
INNOVATION ACTIVITIES		
Innovators	SMEs introducing product or process innovations as percentage of SMEs	Identical
	SMEs introducing marketing or organisational innovations as percentage of SMEs	Identical
	SMEs innovating in-house as percentage of SMEs	Identical
Linkages	Innovative SMEs collaborating with others as percentage of SMEs	Identical
	Public-private co-publications per million population	Identical
	Share of private co-funding of public R&D expenditures	*No regional data*
Intellectual assets	PCT patent applications per billion GDP*	Identical
	Trademark applications per billion GDP*	European trademark applications
	Individual design applications per billion GDP*	European Design applications
IMPACTS		
Employment impacts	Employment in knowledge-intensive activities (manufacturing and services) as percentage of total employment	Employment in medium-high and high-tech manufacturing and knowledge-intensive services
	Employment in fast-growing firms of innovative sectors	*No regional data*
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-firm innovations as percentage of total turnover	For SMEs only

* GDP in Purchasing Power standards

2.2 Regional coverage

The Regional Innovation Scoreboard covers 238 regions in 23 EU Member States, Norway, Serbia and Switzerland at different NUTS levels.[3] 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.

Depending on differences in regional data availability, the RIS covers 32 NUTS 1 level regions and 206 NUTS 2 level regions (**Table 3**, NUTS 1 regions in countries covered at the NUTS 2 level are also counted as NUTS 2 regions). In addition, the EU Member States Cyprus, Estonia, Latvia, Lithuania, 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.

[3] For Serbia, official NUTS codes are not available as Eurostat and Serbia have not yet agreed on statistical regions for the country. In this report, the following unofficial codes will be used: RS11 for Belgrade, RS12 for Vojvodina, RS21 for Šumadija and Western Serbia, and RS22 for Southern and Eastern Serbia.

For the countries included at the country level, their performance levels relative to the EU28 scores from the EIS 2019 have been used.

With some countries only being covered at the NUTS 1 level, there can be significant differences in the average size of regions. For instance, the average population of a NUTS 1 region in France (total population of almost 67 million) is 4.8 million, whereas it is 2.9 million for an average NUTS 2 region in Italy (total population of almost 60.5 million). The average unit of regional innovation performance analysis is 1.66 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 2019 by country

COUNTRY		NUMBER OF REGIONS AT NUTS LEVEL		AVERAGE POPULATION SIZE (2018)	REGIONS (NUTS CODE)	
		1	2			
BE	Belgium	3		3,799,500	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE1) Vlaams Gewest (BE2) Région Wallonne (BE3)	
BG	Bulgaria		6	1,175,000	Severozapaden (BG31) Severen tsentralen (BG32) Severoiztochen (BG33) Yugoiztochen (BG34) Yugozapaden (BG41) Yuzhen tsentralen (BG42)	
CZ	Czechia		8	1,326,300	Praha (CZ01) Střední Čechy (CZ02) Jihozápad (CZ03) Severozápad (CZ04) Severovýchod (CZ05) Jihovýchod (CZ06) Střední Morava (CZ07) Moravskoslezsko (CZ08)	
DK	Denmark		5	1,156,200	Hovedstaden (DK01) Sjælland (DK02) Syddanmark (DK03) Midtjylland (DK04) Nordjylland (DK05)	
DE	Germany		38	2,178,700	Stuttgart (DE11) Karlsruhe (DE12) Freiburg (DE13) Tübingen (DE14) Oberbayern (DE21) Niederbayern (DE22) Oberpfalz (DE23) Oberfranken (DE24) Mittelfranken (DE25) Unterfranken (DE26) Schwaben (DE27) Berlin (DE30) Brandenburg (DE40) Bremen (DE50) Hamburg (DE60) Darmstadt (DE71) Gießen (DE72) Kassel (DE73) Mecklenburg-Vorpommern (DE80) 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 (DEC0) Dresden (DED2) Chemnitz (DED4) Leipzig (DED5) Sachsen-Anhalt (DEE0) Schleswig-Holstein (DEF0) Thüringen (DEG0)	
IE	Ireland		3	1,610,100	Northern and Western (IE04) Southern (IE05) Eastern and Midland (IE06)	
EL	Greece		13	826,200	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) Attiki (EL30) Voreio Aigaio (EL41) Notio Aigaio (EL42) Kriti (EL43)	
ES	Spain		19	2,445,000	Galicia (ES11) Principado de Asturias (ES12) Cantabria (ES13) País Vasco (ES21) Comunidad Foral de Navarra (ES22) La Rioja (ES23) Aragón (ES24) Comunidad de Madrid (ES30) Castilla y León (ES41) Castilla-la Mancha (ES42) Extremadura (ES43) Cataluña (ES51) Comunidad Valenciana (ES52) Illes Balears (ES53) Andalucía (ES61) Región de Murcia (ES62) Ciudad Autónoma de Ceuta (ES63) Ciudad Autónoma de Melilla (ES64) Canarias (ES70)	

Table 3: NUTS 1 and NUTS 2 regions included in RIS 2019 by country

COUNTRY		NUMBER OF REGIONS AT NUTS LEVEL		AVERAGE POPULATION SIZE (2018)	REGIONS (NUTS CODE)	
		1	2			
FR	France	14		4,780,400	Île de France (FR1) Centre - Val de Loire (FRB) Bourgogne - Franche-Comté (FRC) Normandie (FRD) Nord-Pas de Calais – Picardie (FRE) Alsace - Champagne-Ardenne – Lorraine (FRF) Pays de la Loire (FRG) Bretagne (FRH)	Aquitaine - Limousin - Poitou-Charentes (FRI) Languedoc-Roussillon - Midi-Pyrénées (FRJ) Auvergne - Rhône-Alpes (FRK) Provence-Alpes-Côte d'Azur (FRL) Corse (FRM) RUP FR - Régions ultrapériphériques françaises (FRY)
HR	Croatia		2	2,052,700	Jadranska Hrvatska (HR03)	Kontinentalna Hrvatska (HR04)
IT	Italy		21	2,880,200	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	1,404,500	Sostinės regionas (LT01)	Vidurio ir vakarų Lietuvos regionas (LT02)
HU	Hungary		8	1,222,300	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	1,431,800	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		2,940,800	Ostösterreich (AT1) Südösterreich (AT2)	Westösterreich (AT3)
PL	Poland		17	2,233,900	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 stołeczny (PL91) Mazowiecki regionalny (PL92)
PT	Portugal		7	1,470,100	Norte (PT11) Algarve (PT15) Centro (PT16) Lisboa (PT17)	Alentejo (PT18) Região Autónoma dos Açores (PT20) Região Autónoma da Madeira (PT30)
RO	Romania		8	2,441,300	Nord-Vest (RO11) Centru (RO12) Nord-Est (RO21) Sud-Est (RO22)	Sud - Muntenia (RO31) Bucuresti - Ilfov (RO32) Sud-Vest Oltenia (RO41) Vest (RO42)
SI	Slovenia		2	1,033,400	Vzhodna Slovenija (SI03)	Zahodna Slovenija (SI04)
SK	Slovakia		4	1,360,800	Bratislavský kraj (SK01) Západné Slovensko (SK02)	Stredné Slovensko (SK03) Východné Slovensko (SK04)
FI	Finland		5	1,102,600	Helsinki-Uusimaa (FI1B) Etelä-Suomi (FI1C) Länsi-Suomi (FI19)	Pohjois- ja Itä-Suomi (FI1D) Åland (FI20)

Table 3: NUTS 1 and NUTS 2 regions included in RIS 2019 by country

COUNTRY		NUMBER OF REGIONS AT NUTS LEVEL		AVERAGE POPULATION SIZE (2018)	REGIONS (NUTS CODE)	
		1	2			
SE	Sweden		8	1,265,000	Stockholm (SE11) Östra Mellansverige (SE12) Småland med öarna (SE21) Sydsverige (SE22)	Västsverige (SE23) Norra Mellansverige (SE31) Mellersta Norrland (SE32) Övre Norrland (SE33)
UK	United Kingdom	12		5,522,800	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)
NO	Norway		7	756,500	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	1,212,000	Région lémanique (CH01) Espace Mittelland (CH02) Nordwestschweiz (CH03) Zürich (CH04)	Ostschweiz (CH05) Zentralschweiz (CH06) Ticino (CH07)
RS	Serbia[4]		4	1,750,400	Belgrade (RS11) Vojvodina (RS12)	Šumadija and Western Serbia (RS21) Southern and Eastern Serbia (RS22)

2.3 Regional data availability

Regional innovation data for five indicators are directly available from Eurostat. For Population aged 30-34 having completed tertiary education, Lifelong learning, R&D expenditures in the public sector, R&D expenditures in the business sector, and Employment in medium-high/high tech manufacturing and knowledge-intensive services, regional data can be extracted from Eurostat's online regional database. Regional patent data have been extracted from the OECD's REGPAT database. For the six indicators using Community Innovation Survey (CIS) data, regional data are not directly 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, regional data have been made available by CWTS (Leiden University) as part of a contract with the European Commission (DG Research and Innovation). For Trademark applications and Design applications, regional data have been made available by Science Metrix as part of a contract with the European Commission (DG Research and Innovation).

Regional CIS data request

To collect regional CIS data, data requests were made by Eurostat in 2018 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, or countries for which national CIS samples are too small to allow them to deliver reliable regional-level data, and to Norway, Serbia, and Switzerland. Eurostat was able to share regional CIS 2016 data for 25 countries (Austria, Belgium, Bulgaria, Croatia, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom) for the following indicators:

- Non-R&D innovation expenditure by SMEs (share of turnover in SMEs);
- SMEs innovating in-house (share of all SMEs);
- Innovative SMEs collaborating with others (share of all SMEs);
- SMEs with product or process innovation (share of all SMEs);
- SMEs with marketing or organisational innovations (share of all SMEs);
- Sales of new-to-market and new-to-firm innovations by SMEs (share of turnover in 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 firms (which are more likely to have multiple establishments in different regions) and focuses on SMEs only. More details are available in the RIS 2019 Methodology Report.

[4] The NUTS codes for Serbia are not official codes but are used for ease of reference in the RIS 2019 and for producing the regional maps.

Timeliness of regional data

For the RIS 2019, most recent data refer to 2017 for six indicators (Population aged 30-34 with tertiary education, Lifelong learning, Public-private co-publications, Trademark applications, Design applications, and Employment in medium-high/high-tech manufacturing and knowledge-intensive services), 2016 for 10 indicators (International scientific co-publications, R&D expenditures in the public sector, R&D expenditures in the business sector, Non-R&D innovation expenditures, SMEs with product or process innovations, SMEs with marketing or organisational innovations, SMEs innovating in-house, Innovative SMEs collaborating with others, PCT patent applications, and Sales of new-to-market and new-to-firm innovations), and 2015 for one indicator (Most-cited scientific publications).

Following the availability of the most recent data, the RIS 2019 presents a Regional Innovation Index (RII) for five reference years:

- RII2019 using regional CIS 2016 data and the most recent data available at 17 April 2019;
- RII2017 using data two years less timely than those used for the RII2019 (including regional CIS 2014 data);
- RII2015 using data four years less timely than those used for the RII2019 (including regional CIS 2012 data);
- RII2013 using data six years less timely than those used for the RII2019 (including regional CIS 2010 data);
- RII2011 using data eight years less timely than those used for the RII2019 (including regional CIS 2008 data).

Table 4: Regional data availability by indicator

	Data availability most recent year
Lifelong learning	100%
International scientific co-publications	100%
Most-cited scientific publications	100%
Population having completed tertiary education	99.2%
Public-private co-publications	95.4%
Trademark applications	95.4%
SMEs with product or process innovations	95.0%
SMEs with marketing or organisational innovations	95.0%
Innovative SMEs collaborating with others	95.0%
Sales of new-to-market and new-to-firm innovations in SMEs	95.0%
Employment in medium/high-tech manufacturing and knowledge-intensive services	92.9%
Design applications	92.4%
Non-R&D innovation expenditures in SMEs	92.0%
SMEs innovating in-house	92.0%
PCT patent applications	91.2%
All indicators	90.9%
R&D expenditures in the public sector	62.1%
R&D expenditures in the business sector	49.2%

Data availability by indicator and country

For the most recent year, data availability is 90.9%, i.e. regional data are available for 3,676 out of a maximum of 4,046 observations. Data availability differs by indicator, with highest data availability for Lifelong learning, International scientific co-publications and Most-cited scientific publications (**Table 4**). Data availability is below average for Public and Business R&D expenditures.

There are large differences in regional data availability across countries. Data availability is perfect at 100% for eight countries, very good at 95% or more for another four countries, and good at 90% or more for three more countries (**Table 5**). Data availability is between 80% and 90% for seven countries. Data availability for Ireland, Norway and Switzerland is at 75% or just above. For Ireland below-average data availability is explained by a change from two regions using the NUTS 2013 classification to three regions using the NUTS 2016 classification. Not for all indicators data are already available for these 3 new regions. For Norway and Switzerland no 2017 data are available for both Public and Business R&D expenditures. For the Netherlands data availability is low as regional CIS 2016 data are not available.

Imputations for missing data

The full RIS 2019 database contains 20,230 data cells (238 regions, 17 indicators, and 5 years). An exact percentage for overall data availability has not been calculated, as for older years the database includes both real data and data already imputed in previous versions of the Regional Innovation Scoreboard. To improve data availability, several imputation techniques have been used to provide estimates for all missing data. Chapter 3 on the RIS methodology provides more details on the imputation techniques. Data availability after imputation improves to 98.9% with data missing for only 225 observations. For some regions, data could not be imputed. Data availability is 100% for almost all countries, except for:

- Finland (95.3%): data missing for 4 indicators for *Åland* (FI20);
- France (98.7%): data mussing for 2 regions (FRM and FRY);
- Greece (95.9%): incomplete data for 7 regions;
- Ireland (94.1%) no data for patent applications for all regions;
- Italy (99.7%): data missing for Employment in medium-high/high tech manufacturing and knowledge-intensive services for *Valle d'Aosta/Vallée d'Aoste* (ITC2);
- Poland (99.3%): data missing for Employment in medium/high tech manufacturing and knowledge-intensive services for two regions (PL43 and PL52);
- Portugal (95.8%): data missing for three regions (PT15, PT20 and PT30);
- Serbia (94.1%): data missing for PCT patent applications for all regions;
- Spain (97.8%): data missing for 3 regions (ES63, ES64 and ES70);
- Switzerland (95.1%): data missing for Non-R&D innovation expenditure for all regions.

Table 5: Regional data availability by country

		Data availability most recent year			Data availability most recent year
BG	Bulgaria	100%	PL	Poland	93.1%
HR	Croatia	100%	All regions		90.9%
CZ	Czechia	100%	AT	Austria	88.2%
DK	Denmark	100%	BE	Belgium	88.2%
SK	Slovakia	100%	SE	Sweden	88.2%
SI	Slovenia	100%	RS	Serbia	86.8%
RO	Romania	100%	FR	France	87.0%
UK	United Kingdom	100%	LT	Lithuania	82.4%
IT	Italy	99.7%	EL	Greece	80.5%
ES	Spain	96.3%	IE	Ireland	76.5%
FI	Finland	95.3%	NO	Norway	76.5%
PT	Portugal	95.0%	CH	Switzerland	76.5%
DE	Germany	94.1%	NL	Netherlands	52.9%
HU	Hungary	94.1%			

2.4 Structural differences

The RIS 2017 introduced 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 will be performed in the regional profiles. The RIS 2019 includes data for the same set of structural indicators in the regional profiles.

Important are differences in economic structures, with differences in the share of industry in GDP an important factor that could explain why regions performance better or worse on indicators like business R&D expenditures, EPO patent applications and innovative enterprises. The regional profiles include for each region, if data are available from Eurostat, data on the composition of regional employment, using average employment shares for the years 2014-2018, 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. 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 two indicators measuring GDP per capita, both in Euros and in purchasing power standards[5], which are a better measure for interpreting real income differences between regions.

[5] 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 first group of Innovation Leaders includes 38 regions with performance more than 20% above the EU average.
- The second group of Strong Innovators includes 73 regions with performance between 90% and 120% of the EU average.
- The third group of Moderate Innovators includes 97 regions with performance between 50% and 90% of the EU average.
- The fourth group of Modest Innovators includes 30 regions with performance below 50% of the EU average.

Higher performance groups score better on individual indicators

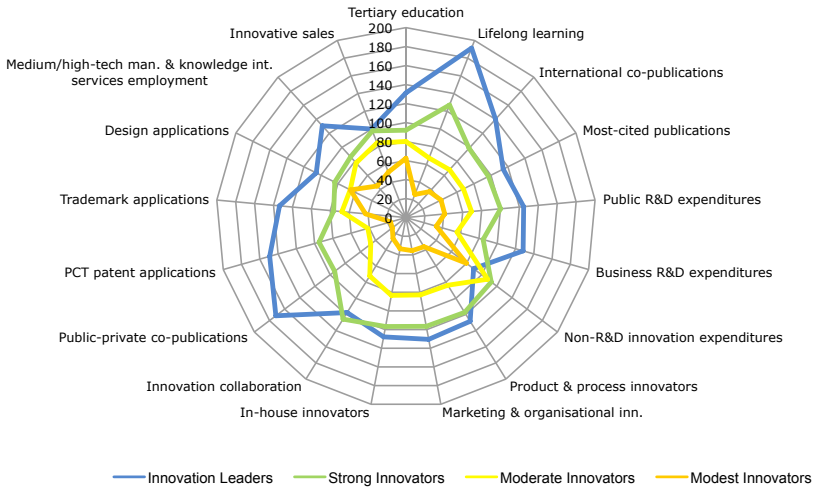
The most innovative regions, on average, perform best on most indicators as shown in the radar graph below (**Figure 1**), where the line for the Modest Innovators is largely embedded within the line for the Moderate Innovators, which is largely embedded within the line for the Strong Innovators. The line for the Innovation Leaders shows that these regions, on average, have the highest performance on 15 indicators, except on Non-R&D innovation expenditures and SMEs collaborating with others, where the Strong Innovators have the highest average performance (**Figure 1** and **Table 6**).[6] The Innovation Leaders perform particularly well, with average performance levels 40% or more above the EU average, on Lifelong learning (191%), Public-private co-publications (172%) and PCT patent applications (149%).

The Strong Innovators perform close to average (between 20% below or 20% above the EU average) on almost all indicators, except for Lifelong learning (127%), SMEs collaborating with others (126%) and Trademark applications (76%). Performance is also relatively high on SMEs with product or process innovations (117%), SMEs with marketing or organisational innovations (116%), and SMEs innovating in-house (117%).

The Moderate Innovators perform below the EU average on almost all indicators, except for Non-R&D innovation expenditures (108%). Performance is below 70% of the EU average for Public R&D expenditures (69%), International scientific co-publications (68%), Most-cited publication (68%), Trademark applications (68%), Lifelong learning (67%), Design applications (66%), Business R&D expenditures (56%), Public-private co-publications (46%) and PCT patent applications (42%).

The Modest Innovators perform below the EU average on all indicators, in particular on PCT patent applications (17%), Public-private co-publications (18%), Lifelong learning (26%) and Innovative SMEs collaborating with others (26%).

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 regions 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.[7] The correction makes sure that this average is equal to the EU average of 100. Full details are provided in the RIS 2019 Methodology Report

[6] The strong performance of both Moderate and Modest 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.

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

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 2019. All regional Innovation Leaders belong to 10 countries. Most regional Strong Innovators belong to EIS Innovation Leader and Strong Innovator countries, only 6 regional Strong Innovators belong to EIS Moderate Innovator country (of which 3 in Portugal). Most regional Moderate Innovators belong to EIS Moderate Innovator countries (almost 85% of the regions in this regional innovation performance group). All regional Modest Innovators belong to EIS Moderate Innovator and Modest Innovator countries. Regional 'pockets of excellence' can be identified in some Moderate Innovator countries: *Praha (Prague)* in Czechia, *Kriti (Crete)* in Greece, and *Friuli-Venezia Giulia* in Italy. At the same time, some regions in EIS Innovation Leader and Strong Innovator countries perform in 'lower' performance groups (for instance, *Niederbayern, Lüneburg, Weser-Ems* and *Koblenz* in Germany, *Åland* in Finland, *Normandie*, *Nord-Pas de Calais-Picard, Corse* and *Régions ultrapériphériques françaises* in France, *Friesland* and *Zeeland* in the Netherlands, and *Norra Mellansverige* and *Mellersta Norrland* in Sweden).

Table 6: Average indicator scores by regional performance group

	Innovation Leaders	Strong Innovators	Moderate Innovators	Modest Innovators
Population having completed tertiary education	131	92	80	62
Lifelong learning	191	127	67	28
International scientific co-publications	140	99	68	37
Most-cited scientific publications	114	97	68	41
R&D expenditures in the public sector	125	100	69	41
R&D expenditures in the business sector	128	84	56	33
Non-R&D innovation expenditures	89	113	108	80
SMEs with product or process innovations	128	117	84	36
SMEs with marketing or organisational innovations	130	116	83	35
SMEs innovating in-house	128	117	83	33
Innovative SMEs collaborating with others	118	126	72	26
Public-private co-publications	172	94	46	18
PCT patent applications	149	95	42	17
Trademark applications	134	76	68	43
Design applications	106	84	66	65
Employment in medium/high tech manufacturing and knowledge-intensive services	131	86	78	45
Sales of new-to-market/new-to-firm innovations (SMEs)	100	98	84	51

Average scores for each performance group relative to the EU average (=100). Scores calculated excluding countries for which regions do not exist and regional data are not available (Cyprus, Estonia, Latvia, Luxembourg and Malta). Scores have been corrected as 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 2019 Methodology Report.

Providing more detail: defining 12 performance sub-groups

For most countries, there is limited variation in regional performance groups. Only in Finland, Germany, Greece, the Netherlands and Sweden, there are three different regional performance groups (**Table 7**). In 15 countries, there are two different regional performance groups, and in Austria, Ireland, Lithuania, Slovenia, Slovakia and Switzerland, all regions are in the same performance group.

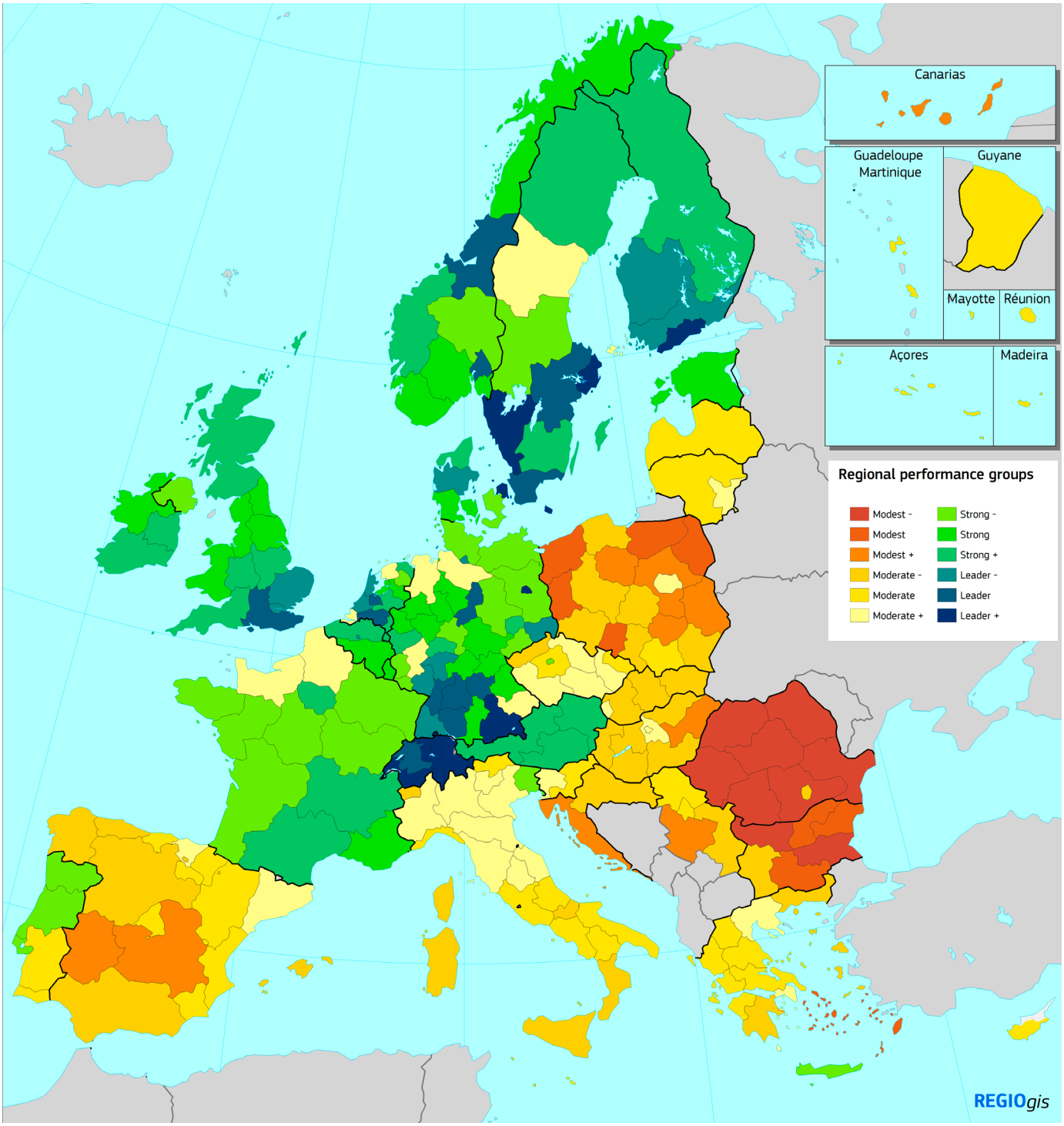
The RIS 2017 introduced three subgroups within each performance group to allow for more diversity at the regional level: the top one-third regions (+), the middle one-third regions and the bottom one-third regions (-). The same subgroups have also been used for the RIS 2019.

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.
- Modest Innovators are shown using three shades of orange, with the lightest orange showing the Modest + Innovators and the darkest orange the Modest - Innovators.

Most of the Innovation Leaders and Strong Innovators are in the former EU15 countries in North-West Europe. Most of the Moderate Innovators and Modest Innovators are in newer Member States and former EU15 countries in the South of Europe.

Figure 2: Regional performance groups



For Cyprus, Estonia, Latvia, Luxembourg and Malta, performance group membership is identical to that in the EIS 2019 report. For these countries, the corresponding colour codes for middle one-third regions have been used.

At the level of subgroups, there is more diversity in performance of regional innovation systems within countries. In Germany, there are seven different subgroups, with the Strong Innovators the largest subgroup. In France, Spain and the Netherlands there are six different subgroups, in Denmark, Greece, Poland, Sweden and the United Kingdom there are five different subgroups, and in Czechia, Finland, Italy and Norway there are four different subgroups. **Table 7** shows that capital regions, which include the larger metropolitan capital areas, tend to perform better than other regions in the same country. For instance, in Czechia, *Praha* (CZ01) is a Strong Innovator, while all other regions are Moderate Innovators.

Table 7: Occurrence of regional performance groups by country

	Performance group EIS 2019	Regional Innovation Leaders			Regional Strong Innovators			Regional Moderate Innovators			Regional Modest Innovators		
		+		-	+		-	+		-	+		-
		12	**13**	**13**	**24**	**24**	**25**	**32**	**32**	**33**	**10**	**10**	**10**
Switzerland	Innovation Leader	6	1										
Sweden	Innovation Leader	2	2		2		1	1					
Finland	Innovation Leader	1		2	1			1					
Denmark	Innovation Leader	1		1	1	1	1						
Netherlands	Innovation Leader		2	2	3	2	1	2					
Luxembourg	*Strong Innovator*												
Belgium	Strong Innovator			1	1	1							
United Kingdom	Strong Innovator		1	2	4	4	1						
Norway	Strong Innovator		2		1	3	1						
Germany	Strong Innovator	2	5	5	3	11	8	4					
Austria	Strong Innovator				3								
Ireland	Strong Innovator				2	1							
France	Strong Innovator				3	1	6	2	1	1			
Estonia	*Strong Innovator*												
Portugal	Moderate Innovator						3		4				
Czechia	Moderate Innovator						1	4	2	1			
Slovenia	Moderate Innovator							1	1				
Cyprus	*Moderate Innovator*												
Malta	*Moderate Innovator*												
Italy	Moderate Innovator						1	8	7	5			
Spain	Moderate Innovator							2	7	5	3	1	1
Greece	Moderate Innovator						1	2	6	3		1	
Lithuania	Moderate Innovator							1	1				
Slovakia	Moderate Innovator							1		3			
Hungary	Moderate Innovator							2		5	1		
Latvia	*Moderate Innovator*												
Serbia	Moderate Innovator								2	1	1		
Poland	Moderate Innovator							1	1	6	4	5	
Croatia	Moderate Innovator									1	1		
Bulgaria	Modest Innovator									1		3	2
Romania	Modest Innovator									1			7

Countries ordered by their performance score in the European Innovation Scoreboard 2019.

3.2 Ranking of regions

The most innovative region in the EU is *Helsinki-Uusimaa* (FI1B) in Finland, followed by *Stockholm* (SE11) in Sweden and *Hovedstaden* (DK01) in Denmark (**Table 8**). The overall most innovative region in 2019 is *Zürich* (CH04). Of the top-5 regions two are from Switzerland and three from the EU. Of the top-10 regions five are from Switzerland and five from the EU. *Zürich* was also the overall most innovative region in 2011 and 2017, *Hovedstaden* (DK01) was the overall most innovative region in 2013 and 2015.

Seven out of the top-25 regions in 2019 are from Switzerland and Germany, four from Sweden, two from the Netherlands and Norway, and one from Denmark, Finland and the United Kingdom. The top-25 regions for all years are from one of these eight countries, no other country is represented in the top-25 in these years. There have been some fluctuations in the top-25 over time with 'only' 17 regions in the top-25 in all years (these regions are highlighted with a *).

Table 8: Top-25 Regional Innovation Leaders

	2011 (RII 2011)	2013 (RII 2013)	2015 (RII 2015)	2017 (RII 2017)	2019 (RII 2019)	RII 2019
1	Zürich (CH04)*	Hovedstaden (DK01)*	Hovedstaden (DK01)*	Zürich (CH04)*	Zürich (CH04)*	160.1
2	Nordwestschweiz (CH03)*	Zürich (CH04)*	Zürich (CH04)*	Stockholm (SE11)*	Ticino (CH07)*	156.8
3	Hovedstaden (DK01)*	Stockholm (SE11)*	Nordwestschweiz (CH03)*	Nordwestschweiz (CH03)*	Helsinki-Uusimaa (FI1B)*	156.0
4	Stockholm (SE11)*	Nordwestschweiz (CH03)*	Stockholm (SE11)*	Hovedstaden (DK01)*	Stockholm (SE11)*	153.8
5	Zentralschweiz (CH06)*	Oberbayern (DE21)*	Västsverige (SE23)*	Sydsverige (SE22)*	Hovedstaden (DK01)*	151.0
6	Sydsverige (SE22)*	Helsinki-Uusimaa (FI1B)*	Sydsverige (SE22)*	Zentralschweiz (CH06)*	Ostschweiz (CH05)*	150.2
7	Oberbayern (DE21)*	Sydsverige (SE22)*	Helsinki-Uusimaa (FI1B)*	Helsinki-Uusimaa (FI1B)*	Nordwestschweiz (CH03)*	149.6
8	Karlsruhe (DE12)*	Zentralschweiz (CH06)*	Oberbayern (DE21)*	Ticino (CH07)*	Zentralschweiz (CH06)*	146.1
9	Helsinki-Uusimaa (FI1B)*	Karlsruhe (DE12)*	Karlsruhe (DE12)*	Ostschweiz (CH05)*	Berlin (DE30)*	145.4
10	Tübingen (DE14)	Östra Mellansverige (SE12)*	Zentralschweiz (CH06)*	Oberbayern (DE21*)	Région lémanique (CH01)*	140.7
11	Région lémanique (CH01)*	Västsverige (SE23)*	Région lémanique (CH01)*	Région lémanique (CH01)*	Oberbayern (DE21)*	140.4
12	Ticino (CH07)*	Ticino (CH07)*	Ostschweiz (CH05)*	Västsverige (SE23)*	Västsverige (SE23)*	138.8
13	Östra Mellansverige (SE12)*	Tübingen (DE14)	Berlin (DE30)*	Trøndelag (NO06)	Sydsverige (SE22)*	137.0
14	Ostschweiz (CH05)*	Ostschweiz (CH05)*	Ticino (CH07)*	Tübingen (DE14)	Karlsruhe (DE12)*	136.9
15	Stuttgart (DE11)*	Mittelfranken (DE25)*	Stuttgart (DE11)*	Berlin (DE30)*	Trøndelag (NO06)	136.8
16	Västsverige (SE23)*	Région lémanique (CH01)*	Rheinhessen-Pfalz (DEB3)	Karlsruhe (DE12)*	Oslo og Akershus (NO01)	135.6
17	Rheinhessen-Pfalz (DEB3)	Stuttgart (DE11)*	Tübingen (DE14)	Östra Mellansverige (SE12)*	Espace Mittelland (CH02)	134.8
18	Freiburg (DE13)	Rheinhessen-Pfalz (DEB3)	Freiburg (DE13)	South East (UKJ)	Utrecht (NL31)	134.8
19	Mittelfranken (DE25)*	Berlin (DE30)*	Östra Mellansverige (SE12)*	Utrecht (NL31)	Tübingen (DE14)	132.9
20	Berlin (DE30)*	Freiburg (DE13)	Midtjylland (DK04)	Stuttgart (DE11)*	Östra Mellansverige (SE12)*	131.9
21	Midtjylland (DK04)	Midtjylland (DK04)	Utrecht (NL31)	Midtjylland (DK04)	Braunschweig (DE91)	130.8
22	Espace Mittelland (CH02)	Darmstadt (DE71)	Noord-Brabant (NL41)	Oslo og Akershus (NO01)	South East (UKJ)	129.9
23	Darmstadt (DE71)	Noord-Brabant (NL41)	Trøndelag (NO06)	Espace Mittelland (CH02)	Stuttgart (DE11)*	129.5
24	Unterfranken (DE26)	Utrecht (NL31)	Mittelfranken (DE25)*	London (UKI)	Noord-Brabant (NL41)	129.1
25	Köln (DEA2)	Braunschweig (DE91)	Espace Mittelland (CH02)	Mittelfranken (DE25)*	Mittelfranken (DE25)*	127.5

The top-ranking region of the Strong Innovators group is *Westösterreich* (AT3) in Austria (**Table 9**). *Vlaams Gewest* (BE2) in Belgium ranks second and *South West* (UKK) in the United Kingdom ranks third. All of the top-10 regions in the Strong Innovators group perform at least 15% above the EU average.

Mellersta Norrland (SE32) in Sweden is the top-ranking region of the Moderate Innovators group, with a performance of more than 89% of the EU average. *Emilia-Romagna* (ITH5) in Italy ranks second and *Bratislavský kraj* (SK01) in Slovakia ranks third.

Of the Modest Innovators group, *Észak-Alföld* (HU32) in Hungary ranks first with a performance of almost 50% of the EU average. *Šumadija* and *Western Serbia* (RS21) in Serbia ranks second, and *Mazowiecki regionalny* (PL92) in Poland ranks third.

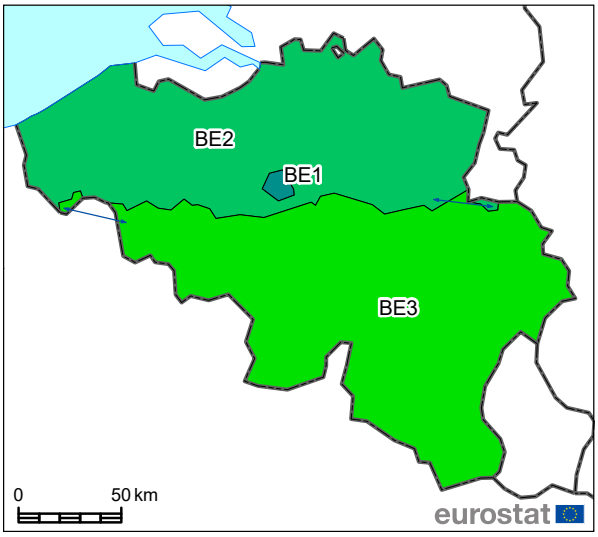
Table 9: Top-10 Regions by regional performance groups

Top-10 Strong Innovators			Top-10 Moderate Innovators			Top-10 Modest Innovators		
Rank	Region	RII 2019	Rank	Region	RII 2019	Rank	Region	RII 2019
1	Westösterreich (AT3)	119.9	1	Mellersta Norrland (SE32)	89.4	1	Észak-Alföld (HU32)	49.7
2	Vlaams Gewest (BE2)	119.4	2	Emilia-Romagna (ITH5)	89.1	2	Šumadija and Western Serbia (RS21)	48.9
3	South West (UKK)	119.1	3	Bratislavský kraj (SK01)	88.5	3	Mazowiecki regionalny (PL92)	47.0
4	Gelderland (NL22)	118.8	4	Koblenz (DEB1)	87.7	4	Lubelskie (PL81)	46.2
5	Limburg (NL42)	118.2	5	Niederbayern (DE22)	87.4	5	Swietokrzyskie (PL72)	46.1
6	Köln (DEA2)	117.4	6	Zahodna Slovenija (SI04)	86.7	6	Kujawsko-Pomorskie (PL61)	46.0
7	Pohjois- ja Itä-Suomi (FI1D)	117.4	7	Lombardia (ITC4)	86.6	7	Jadranska Hrvatska (HR03)	45.0
8	Vestlandet (NO05)	117.3	8	Sostinės regionas (LT01)	86.4	8	Castilla-la Mancha (ES42)	44.7
9	Île de France (FR1)	116.5	9	Zeeland (NL34)	86.3	9	Extremadura (ES43)	43.4
10	Südösterreich (AT2)	116.2	10	Normandie (FRD)	85.4	10	Podlaskie (PL84)	43.3

3.3 Differences in 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 including the country's capital city are highlighted in bold.

BELGIUM



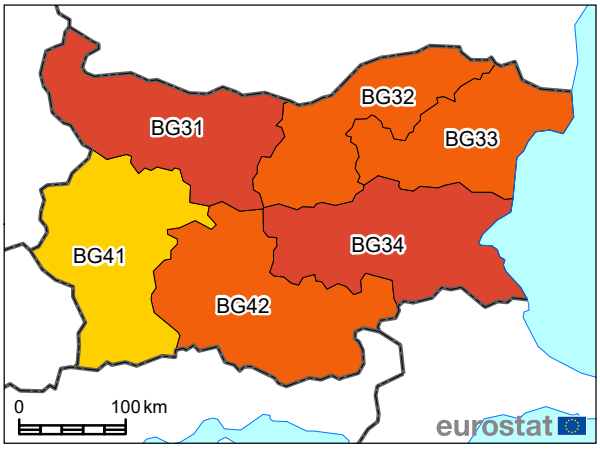
NUTS	Region	RII	Rank	Group	Change
BE1	**Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest**	121.9	35	Leader -	13.5
BE2	Vlaams Gewest	119.4	40	Strong +	2.2
BE3	Région Wallonne	101.6	84	Strong	5.6

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Belgium is a Strong Innovator and includes three regions.

Région de Bruxelles-Capitale (BE1), or Brussels-Capital Region, is an Innovation Leader -. *Vlaams Gewest* (BE2), or the Flemish Region occupying the northern part of Belgium, is a Strong + Innovator. *Région Wallonne* (BE3), or the Walloon Region occupying the southern part of Belgium, is a Strong Innovator. For all three regions, performance has increased over time, and most strongly for *Région de Bruxelles-Capitale* (BE1).

BULGARIA



NUTS	Region	RII	Rank	Group	Change
BG31	Severozapaden	31.2	231	Modest -	-3.0
BG32	Severen tsentralen	38.4	225	Modest	1.0
BG33	Severoiztochen	37.3	227	Modest	-1.3
BG34	Yugoiztochen	35.7	229	Modest -	-1.5
BG41	**Yugozapaden**	54.2	192	Moderate -	2.5
BG42	Yuzhen tsentralen	37.6	226	Modest	-0.9

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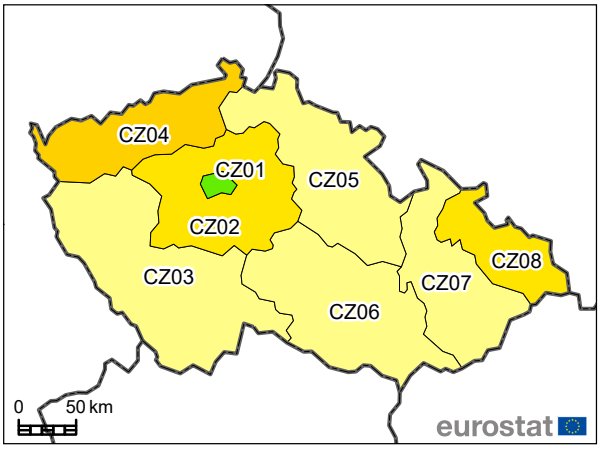
Bulgaria is a Modest Innovator and includes six regions.

Yugozapaden (BG41), the capital region, is the only Moderate Innovator, all other regions are Modest Innovators. Innovation performance has increased for two regions, *Yugozapaden* (BG41) and *Severen tsentralen* (BG32), and performance has decreased for the other four regions.

CZECHIA



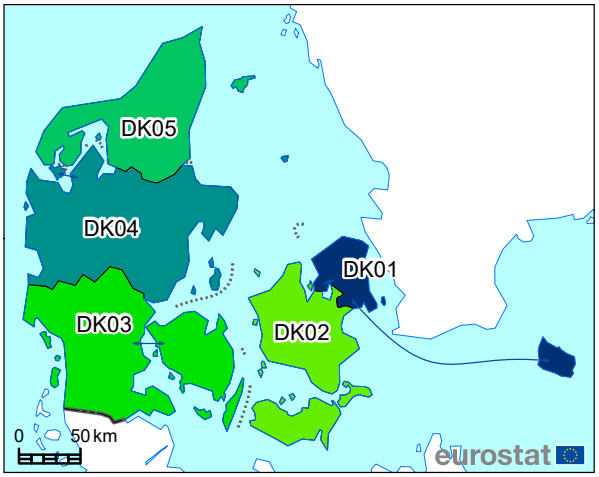
NUTS	Region	RII	Rank	Group	Change
CZ01	**Praha**	98.9	87	Strong -	1.0
CZ02	Střední Čechy	75.9	144	Moderate	-6.7
CZ03	Jihozápad	78.7	137	Moderate +	2.5
CZ04	Severozápad	57.4	182	Moderate -	-1.0
CZ05	Severovýchod	84.7	124	Moderate +	-1.7
CZ06	Jihovýchod	81.2	129	Moderate +	-0.5
CZ07	Střední Morava	76.5	142	Moderate +	0.9
CZ08	Moravskoslezsko	75.2	146	Moderate	8.7

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Czechia is a Moderate Innovator and includes eight regions.

Praha (CZ01), the capital region, is a Strong - Innovator, performing very close to the average performance of the EU. All other regions are Moderate Innovators; four regions –*Jihozápad* (CZ03), *Severovýchod* (CZ05), *Jihovýchod* (CZ06) and *Střední Morava* (CZ07), are Moderate + Innovators, the other three regions are Moderate Innovators. For four regions, performance has increased, most strongly for *Moravskoslezsko* (CZ08), and for four regions, performance has decreased.

DENMARK



NUTS	Region	RII	Rank	Group	Change
DK01	**Hovedstaden**	151.0	5	Leader +	-6.2
DK02	Sjælland	93.7	98	Strong -	-21.2
DK03	Syddanmark	100.5	86	Strong	-9.0
DK04	Midtjylland	127.3	26	Leader -	-2.2
DK05	Nordjylland	111.6	59	Strong +	2.5

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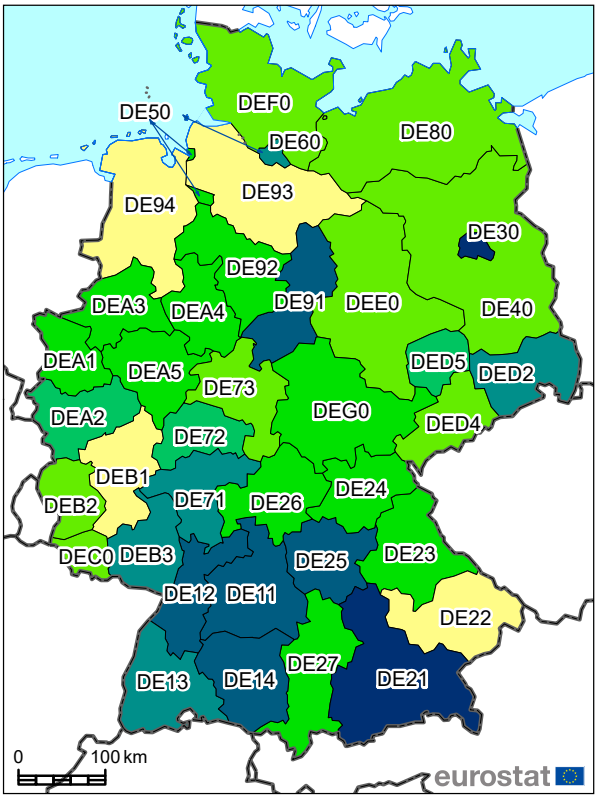
Denmark is an Innovation Leader and includes five regions.

All five regions belong to different performance subgroups. *Hovedstaden* (DK01), the capital region, is an Innovation Leader +, and is the fifth 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 Strong – Innovator.

Performance has declined for four regions, most strongly for *Sjælland* (DK02). Performance has only increased for *Nordjylland* (DK05).

GERMANY



NUTS	Region	RII	Rank	Group	Change
DE11	Stuttgart	129.5	23	Leader	-7.5
DE12	Karlsruhe	136.9	14	Leader	-8.9
DE13	Freiburg	123.5	29	Leader -	-10.9
DE14	Tübingen	132.9	19	Leader	-9.2
DE21	Oberbayern	140.4	11	Leader +	-6.5
DE22	Niederbayern	87.4	116	Moderate	-9.7
DE23	Oberpfalz	105.3	73	Strong	-18.2
DE24	Oberfranken	107.0	68	Strong	-16.5
DE25	Mittelfranken	127.5	25	Leader	-5.2
DE26	Unterfranken	109.1	65	Strong	-15.3
DE27	Schwaben	103.9	77	Strong	-9.0
DE30	**Berlin**	145.4	9	Leader +	15.7
DE40	Brandenburg	96.7	91	Strong -	0.5
DE50	Bremen	109.3	64	Strong	-3.2
DE60	Hamburg	122.4	33	Leader -	4.3
DE71	Darmstadt	122.8	32	Leader -	-2.5
DE72	Gießen	115.1	51	Strong +	-2.2
DE73	Kassel	91.2	107	Strong -	-4.6
DE80	Mecklenburg-Vorpommern	92.7	101	Strong -	2.8
DE91	Braunschweig	130.8	21	Leader	9.6
DE92	Hannover	103.5	79	Strong	-9.7
DE93	Lüneburg	85.3	122	Moderate	-8.9
DE94	Weser-Ems	75.9	143	Moderate	-14.3
DEA1	Düsseldorf	103.0	80	Strong	-10.8
DEA2	Köln	117.4	44	Strong +	-6.1
DEA3	Münster	102.6	82	Strong	-5.8
DEA4	Detmold	105.8	71	Strong	-5.6
DEA5	Arnsberg	101.2	85	Strong	-12.1
DEB1	Koblenz	87.7	115	Moderate	-12.6
DEB2	Trier	98.1	88	Strong -	3.4
DEB3	Rheinhessen-Pfalz	126.5	27	Leader -	-7.8
DEC0	Saarland	97.1	90	Strong -	-9.9
DED2	Dresden	121.9	34	Leader -	-1.3
DED4	Chemnitz	98.0	89	Strong -	10.0
DED5	Leipzig	111.8	58	Strong +	11.9
DEE0	Sachsen-Anhalt	90.2	111	Strong -	-2.4
DEF0	Schleswig-Holstein	93.4	99	Strong -	-9.8
DEG0	Thüringen	104.6	75	Strong	-3.6

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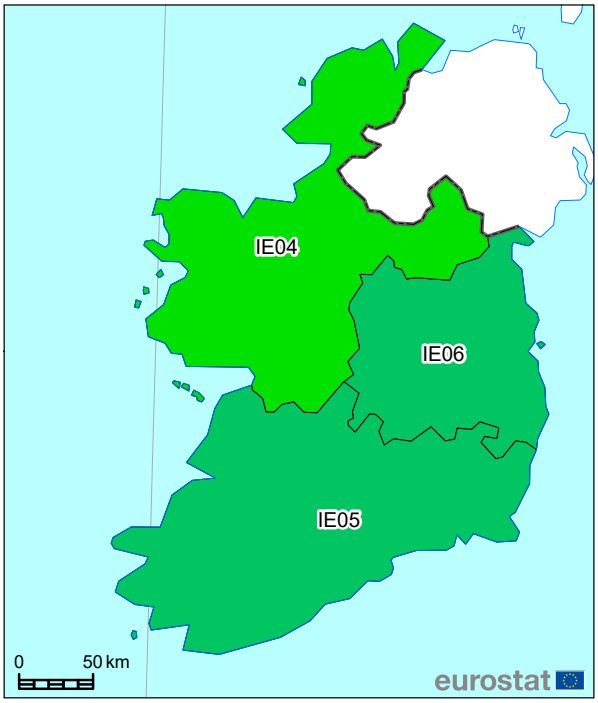
Germany is a Strong Innovator and includes 38 regions.

The South of Germany is, on average, more innovative than the West, North or East. The most innovative region is the capital region *Berlin* (DE30), followed by *Oberbayern* (DE21), *Karlsruhe* (DE12), *Tübingen* (DE14), *Braunschweig* (DE91), *Stuttgart* (DE11) and *Mittelfranken* (DE25). In total there are 12 Innovation Leaders, 22 Strong Innovators and 4 Moderate Innovators.

Performance has increased for 8 regions, most notably for *Berlin* (DE30), *Leipzig* (DED5), *Chemnitz* (DED4) and *Braunschweig* (DE91).

Performance has decreased for 30 regions, and most strongly for *Oberpfalz* (DE23), *Oberfranken* (DE24), *Unterfranken* (DE26), *Weser-Ems* (DE94), *Koblenz* (DEB1), *Arnsberg* (DEA5), *Freiburg* (DE13) and *Düsseldorf* (DEA1).

IRELAND



NUTS	Region	RII	Rank	Group	Change
IE04	Northern and Western	104.0	76	Strong	4.6
IE05	Southern	111.3	61	Strong +	3.3
IE06	**Eastern and Midland**	110.5	62	Strong +	-0.6

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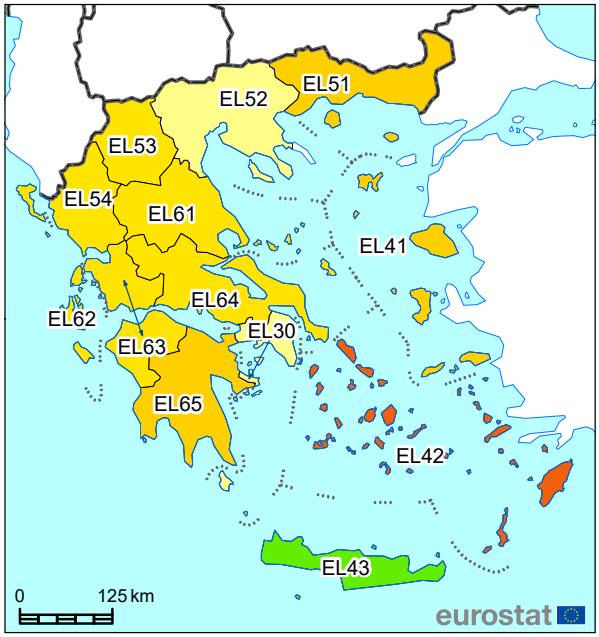
Ireland is a Strong Innovator and includes three regions.

All three regions are Strong Innovators, with *Southern* (IE05) and *Eastern* and *Midland* (IE06) both being Strong + Innovators. Performance has increased in *Northern* and *Western* (IE04) and *Southern* (IE05).

GREECE



NUTS	Region	RII	Rank	Group	Change
EL51	Anatoliki Makedonia, Thraki	57.2	183	Moderate -	14.8
EL52	Kentriki Makedonia	79.4	135	Moderate +	21.3
EL53	Dytiki Makedonia	70.9	151	Moderate	23.1
EL54	Ipeiros	65.9	163	Moderate	12.5
EL61	Thessalia	68.4	158	Moderate	17.0
EL62	Ionia Nisia	59.1	175	Moderate	22.8
EL63	Dytiki Ellada	73.8	150	Moderate	17.8
EL64	Sterea Ellada	60.2	174	Moderate	9.9
EL65	Peloponnisos	55.9	190	Moderate -	7.6
EL30	**Attiki**	82.4	126	Moderate +	19.2
EL41	Voreio Aigaio	56.0	188	Moderate -	19.0
EL42	Notio Aigaio	38.5	224	Modest	-12.3
EL43	Kriti	94.4	95	Strong -	30.1

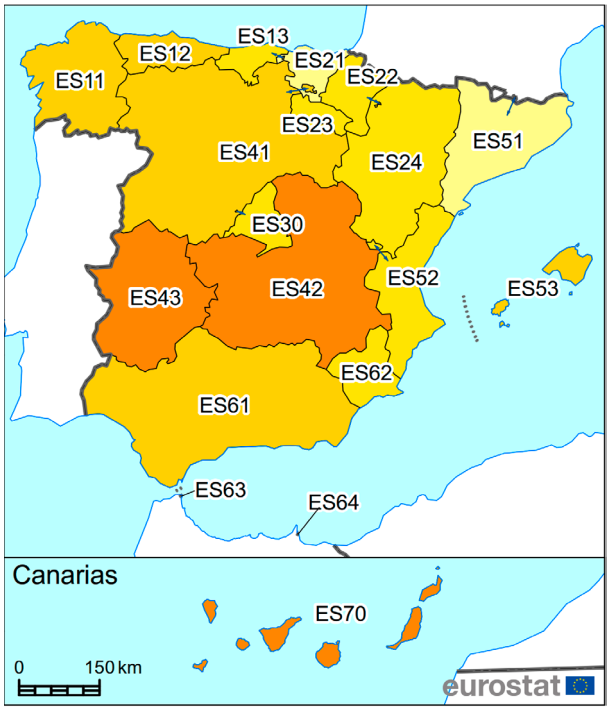
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Greece is a Moderate Innovator and includes 13 regions.

Kriti (EL43) is the only Strong Innovator and the most innovative Greek region. Most other regions are Moderate Innovators, with *Attiki* (EL30) and *Kentriki Makedonia* (EL52) being Moderate + Innovators. *Notio Aigaio* EL42) is the only Modest Innovator.

Performance has increased for almost all regions, and most strongly for *Kriti* (EL43), *Dytiki Makedonia* (EL53) and *Ionia Nisia* (EL62). Performance has declined for only one region, *Notio Aigaio* (EL42).

SPAIN



NUTS	Region	RII	Rank	Group	Change
ES11	Galicia	55.7	190	Moderate +	2.5
ES12	Principado de Asturias	58.4	178	Moderate -	2.9
ES13	Cantabria	60.2	173	Moderate	8.4
ES21	País Vasco	79.8	132	Moderate +	8.8
ES22	Comunidad Foral de Navarra	75.5	145	Moderate	2.8
ES23	La Rioja	67.5	161	Moderate	4.1
ES24	Aragón	64.7	166	Moderate	4.9
ES30	**Comunidad de Madrid**	74.0	149	Moderate	4.1
ES41	Castilla y León	51.6	201	Moderate -	-3.6
ES42	Castilla-la Mancha	44.7	217	Modest +	-1.4
ES43	Extremadura	43.4	218	Modest +	-1.4
ES51	Cataluña	77.6	140	Moderate +	5.0
ES52	Comunidad Valenciana	69.3	157	Moderate	7.3
ES53	Illes Balears	52.3	197	Moderate -	5.0
ES61	Andalucía	51.0	205	Moderate -	2.0
ES62	Región de Murcia	59.0	176	Moderate	8.7
ES63	Ciudad Autónoma de Ceuta	26.0	234	Modest -	2.1
ES64	Ciudad Autónoma de Melilla	38.9	223	Modest	14.9
ES70	Canarias	46.1	214	Modest +	3.6

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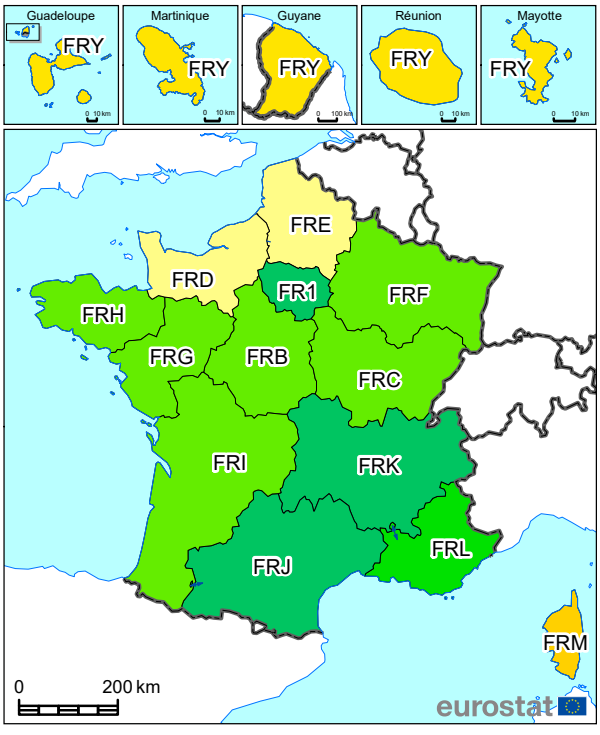
Spain is a Moderate Innovator and includes 19 regions.

Regional performance differences are high with the best performing region, *País Vasco* (ES21), performing three times as well as the lowest performing region, *Ciudad Autónoma de Ceuta* (ES63). Most Spanish regions are Moderate Innovators and five regions are Modest Innovators. Performance has increased for 16 regions, and most strongly for *Ciudad Autónoma de Melilla* (ES64).

FRANCE



NUTS	Region	RII	Rank	Group	Change
FR1	**Île de France**	116.5	47	Strong +	-3.3
FRB	Centre – Val de Loire	91.1	109	Strong -	-1.4
FRC	Bourgogne – Franche-Comté	92.5	103	Strong -	-1.8
FRD	Normandie	85.4	121	Moderate +	-1.4
FRE	Nord-Pas de Calais – Picardie	79.6	133	Moderate +	-2.7
FRF	Alsace – Champagne-Ardenne	91.5	106	Strong -	-2.9
FRG	Pays de la Loire	93.9	96	Strong -	6.2
FRH	Bretagne	95.9	92	Strong -	2.0
FRI	Aquitaine – Limousin – Poitou-	93.9	97	Strong -	1.5
FRJ	Languedoc-Roussillon – Midi-	113.3	55	Strong +	-0.9
FRK	Auvergne – Rhône-Alpes	115.4	50	Strong +	3.8
FRL	Provence-Alpes-Côte d'Azur	102.5	83	Strong	2.4
FRM	Corse	54.1	193	Moderate -	9.3
FRY	Régions ultrapéri¬phériques	60.6	172	Moderate	10.8

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France is a Strong Innovator and includes 14 regions.

Île de France (FR1), the capital region, *Languedoc-Roussillon - Midi-Pyrénées* (FRJ) and *Auvergne - Rhône-Alpes* (FRK) are all Strong + Innovators. *Provence-Alpes-Côte d'Azur* (FRL) is a Strong Innovator and six more regions are Strong – Innovators Four regions are Moderate Innovators, with weakest performance in *Corse* (FRM) and *Régions ultrapéri-phériques françaises* (FRY).

Performance has improved for seven regions, and strongest in *Régions ultrapéri-phériques françaises* (FRY) and *Corse* (FRM). Performance has decreased in seven regions, most notably in *Île de France* (FR1), *Alsace - Champagne-Ardenne – Lorraine* (FRF) and *Nord-Pas de Calais – Picardie* (FRE).

CROATIA

NUTS	Region	RII	Rank	Group	Change
HR03	Jadranska Hrvatska	45.0	216	Modest +	-3.2
HR04	**Kontinentalna Hrvatska**	58.5	177	Moderate	1.7

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Croatia is a Moderate Innovator and includes two regions.

Kontinentalna Hrvatska (HR03), the capital region, is a Moderate Innovator, and performance has increased. *Jadranska Hrvatska* (HR04) is a Modest + Innovator, and performance has decreased.

ITALY

NUTS	Region	RII	Rank	Group	Change
ITC1	Piemonte	79.8	131	Moderate +	5.6
ITC2	Valle d'Aosta/ Vallée d'Aoste	57.1	184	Moderate -	2.6
ITC3	Liguria	67.7	160	Moderate	8.9
ITC4	Lombardia	86.6	118	Moderate +	8.0
ITH1	Provincia Autonoma Bolzano/ Bozen	68.0	159	Moderate	3.1
ITH2	Provincia Autonoma Trento	82.1	127	Moderate +	11.0
ITH3	Veneto	84.9	123	Moderate +	7.7
ITH4	Friuli-Venezia Giulia	92.6	102	Strong -	7.7
ITH5	Emilia-Romagna	89.1	113	Moderate +	11.1
ITI1	Toscana	79.1	136	Moderate +	11.1
ITI2	Umbria	79.5	134	Moderate +	12.4
ITI3	Marche	81.2	128	Moderate +	12.9
ITI4	**Lazio**	74.3	147	Moderate	1.4
ITF1	Abruzzo	69.8	156	Moderate	15.3
ITF2	Molise	57.4	181	Moderate -	12.5
ITF3	Campania	63.3	168	Moderate	11.3
ITF4	Puglia	61.2	171	Moderate	5.3
ITF5	Basilicata	62.7	169	Moderate	15.0
ITF6	Calabria	51.1	203	Moderate -	7.6
ITG1	Sicilia	56.5	187	Moderate -	6.7
ITG2	Sardegna	51.1	204	Moderate -	0.3

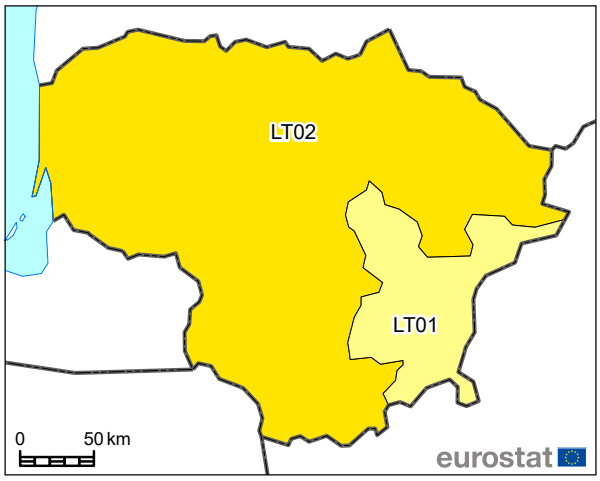
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Italy is a Moderate Innovator and includes 21 regions.

Regional performance differences are high in Italy with the best performing region, *Friuli-Venezia Giulia* (ITH4), performing 80% higher than the lowest performing regions, *Sicilia* (ITG1) and *Sardegna* (ITG2). *Friuli-Venezia Giulia* (ITH4) is the only Strong Innovator, all other regions are Moderate Innovators. Innovation performance is higher in more northern regions as compared to more southern regions.

For all regions, performance has improved, most notably for *Abruzzo* (ITF1) and *Basilicata* (ITF5).

LITHUANIA



NUTS	Region	RII	Rank	Group	Change
LT01	**Sostinės regionas**	86.4	119	Moderate +	25.5
LT02	Vidurio ir vakarų Lietuvos regionas	65.4	165	Moderate	18.5

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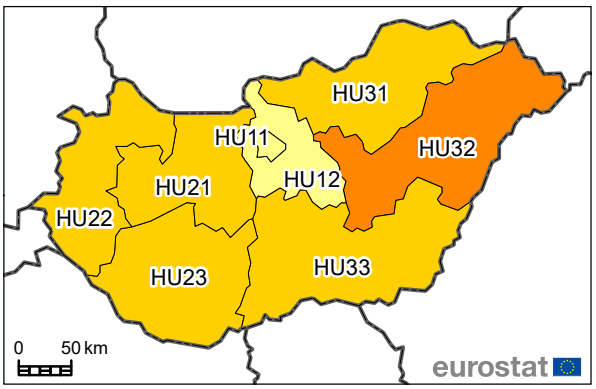
Lithuania is a Moderate Innovator and includes two regions.

Both are also Moderate Innovators. *Sostinės regionas* (LT01), the capital region, is the most innovative region. Performance has increased strongly for both regions.

HUNGARY



NUTS	Region	RII	Rank	Group	Change
HU11	**Budapest**	80.6	130	Moderate +	-1.2
HU12	Pest	77.8	139	Moderate +	6.3
HU21	Közép-Dunántúl	51.0	206	Moderate -	-6.3
HU22	Nyugat-Dunántúl	52.6	195	Moderate -	-5.0
HU23	Dél-Dunántúl	50.9	207	Moderate -	2.8
HU31	Észak-Magyarország	50.7	208	Moderate -	5.5
HU32	Észak-Alföld	49.7	210	Modest +	1.2
HU33	Dél-Alföld	52.1	198	Moderate -	1.1

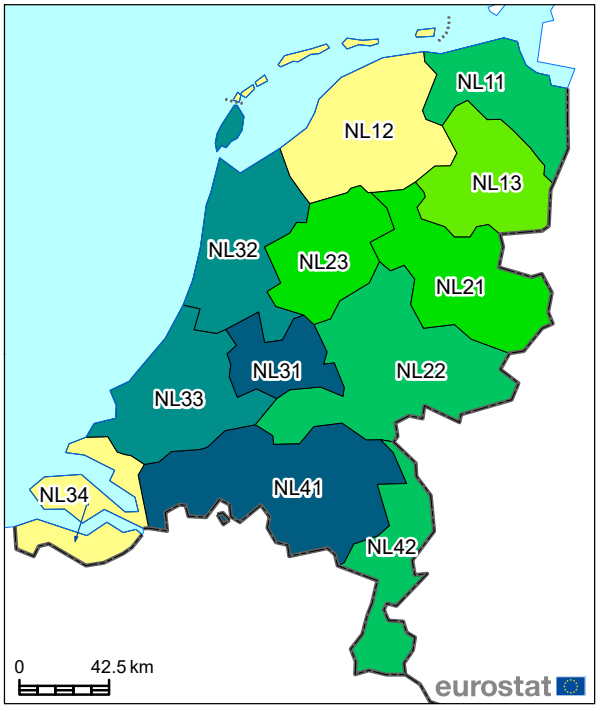
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Hungary is a Moderate Innovator and includes eight regions.

Seven regions are also Moderate Innovators, only *Észak-Alföld* (HU32) is a Modest Innovator. *Budapest* (HU11), the capital region, is the most innovative region, and one of two Moderate + Innovators. Performance has increased for five regions and most strongly for *Pest* (HU12) and *Észak-Magyarország* (HU31).

Performance has decreased for three regions.

NETHERLANDS



NUTS	Region	RII	Rank	Group	Change
NL11	Groningen	113.3	54	Strong +	11.4
NL12	Friesland	83.8	125	Moderate +	3.9
NL13	Drenthe	95.8	93	Strong -	18.7
NL21	Overijssel	109.4	63	Strong	5.1
NL22	Gelderland	118.8	42	Strong +	9.0
NL23	Flevoland	104.8	74	Strong	2.2
NL31	Utrecht	134.8	18	Leader	14.3
NL32	**Noord-Holland**	123.0	31	Leader -	9.8
NL33	Zuid-Holland	121.5	37	Leader -	10.2
NL34	Zeeland	86.3	120	Moderate +	2.1
NL41	Noord-Brabant	129.1	24	Leader	6.4
NL42	Limburg	118.2	43	Strong +	11.8

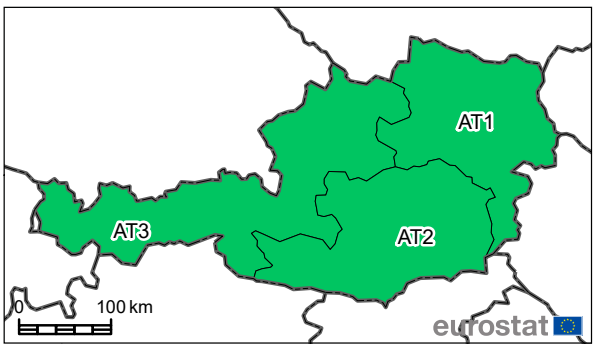
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

The Netherlands is an Innovation Leader and includes 12 regions.

Utrecht (NL31) and *Noord-Brabant* (NL42) are Innovation Leaders, and both regions are also among the top-25 most innovative regions in Europe. Two more regions are Innovation Leaders -, five regions are Strong Innovators, and *Friesland* (NL12) *Zeeland* (NL34) being the weakest innovating region.

Performance has increased for all regions, most notably for *Drenthe* (NL13) and *Utrecht* (NL31).

AUSTRIA



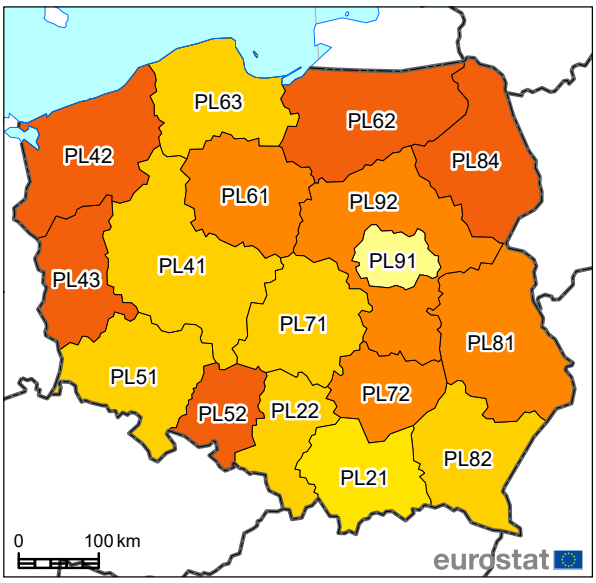
NUTS	Region	RII	Rank	Group	Change
AT1	**Ostösterreich**	114.8	52	Strong +	6.1
AT2	Südösterreich	116.2	48	Strong +	9.2
AT3	Westösterreich	119.9	39	Strong +	15.0

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Austria is a Strong Innovator and includes three regions which are all Strong + Innovators.

Innovation performance is highest in *Westösterreich* (AT3). Performance has increased for all regions, most strongly for *Westösterreich* (AT3).

POLAND



NUTS	Region	RII	Rank	Group	Change
PL21	Malopolskie	70.1	155	Moderate	16.7
PL22	Slaskie	51.4	202	Moderate -	4.5
PL41	Wielkopolskie	53.0	194	Moderate -	4.0
PL42	Zachodniopomorskie	43.1	220	Modest	7.7
PL43	Lubuskie	41.0	222	Modest	0.9
PL51	Dolnoslaskie	57.0	186	Moderate -	4.8
PL52	Opolskie	41.2	221	Modest	2.5
PL61	Kujawsko-Pomorskie	46.0	215	Modest +	2.3
PL62	Warminsko-Mazurskie	37.0	228	Modest	-4.6
PL63	Pomorskie	57.7	180	Moderate -	5.3
PL71	Lódzkie	52.4	196	Moderate -	6.3
PL72	Swietokrzyskie	46.1	214	Modest +	6.2
PL81	Lubelskie	46.2	213	Modest +	5.8
PL82	Podkarpackie	58.3	179	Moderate -	14.0
PL84	Podlaskie	43.3	219	Modest	7.2
PL91	**Warszawski stoleczny**	78.7	138	Moderate +	0.2
PL92	Mazowiecki regionalny	47.0	212	Modest +	0.2

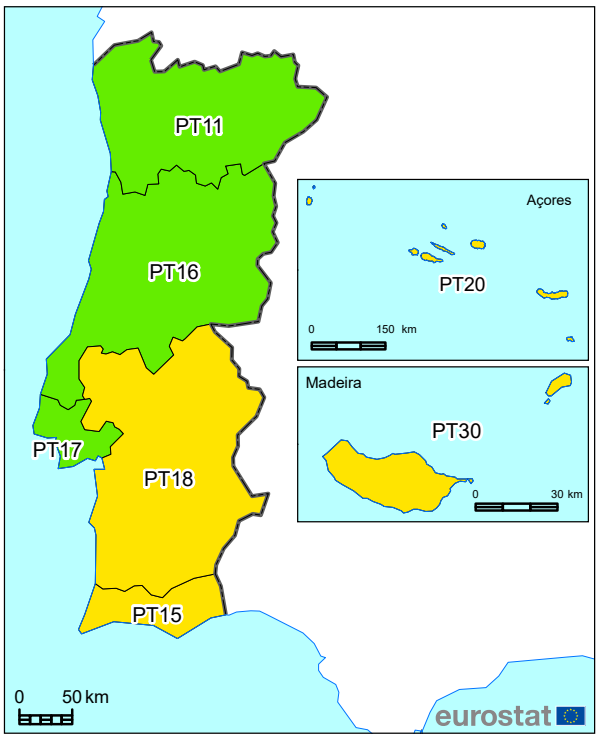
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Poland is a Moderate Innovator and includes 17 regions.

Warszawski stoleczny (PL91), the capital region, is the most innovative region, and the only Moderate + Innovator. Seven more regions are Moderate Innovators, and nine regions are Modest Innovators.

Performance has increased all regions, except for *Warminsko-Mazurskie* (PL62) where performance has declined. Performance has increased most in *Malopolskie* (PL21) and *Podkarpackie* (PL82).

PORTUGAL



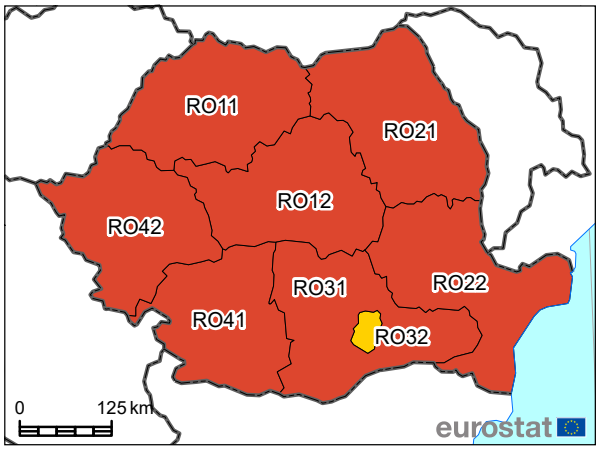
NUTS	Region	RII	Rank	Group	Change
PT11	Norte	92.7	100	Strong -	13.8
PT15	Algarve	74.1	148	Moderate	2.7
PT16	Centro	91.6	105	Strong -	8.9
PT17	**Lisboa**	94.6	94	Strong -	5.7
PT18	Alentejo	70.6	152	Moderate	5.1
PT20	Região Autónoma dos Açores	63.5	167	Moderate	3.4
PT30	Região Autónoma da Madeira	70.4	154	Moderate	16.3

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Portugal is a Moderate Innovator and includes seven regions.

Three regions are Strong – Innovators and four regions are Moderate innovators. *Lisboa* (PT17), the capital region, is the most innovative region. Performance has improved for all regions, most strongly for *Região Autónoma da Madeira* (PT30) and *Norte* (PT11).

ROMANIA



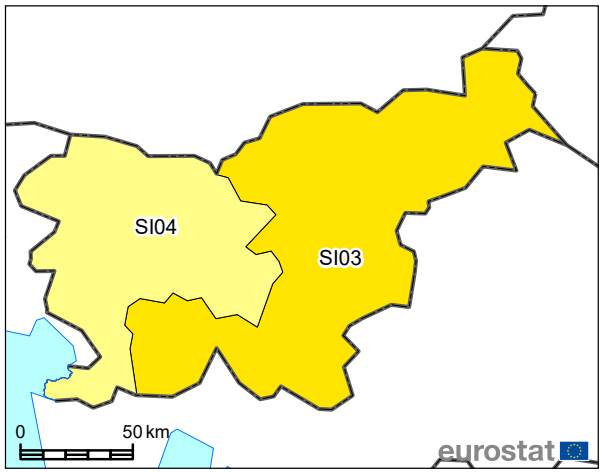
NUTS	Region	RII	Rank	Group	Change
RO11	Nord-Vest	29.7	232	Modest -	-9.8
RO12	Centru	27.3	233	Modest -	-10.8
RO21	Nord-Est	21.5	236	Modest -	-19.0
RO22	Sud-Est	22.1	235	Modest -	-19.5
RO31	Sud - Muntenia	18.4	237	Modest -	-16.8
RO32	**Bucuresti - Ilfov**	51.6	200	Moderate -	-7.9
RO41	Sud-Vest Oltenia	14.3	238	Modest -	-16.4
RO42	Vest	32.8	230	Modest -	-5.7

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Romania is a Modest Innovator and includes eight regions.

Regional performance differences are high in Romania with the best performing region, *Bucuresti – Ilfov* (RO32), performing more than 3.6 times as well as the lowest performing region, *Sud-Vest Oltenia* (RO41). All Romanian regions are Modest - Innovators, only *Bucuresti - Ilfov* (RO41) is a Moderate - Innovator. Performance has declined strongly for all regions.

SLOVENIA



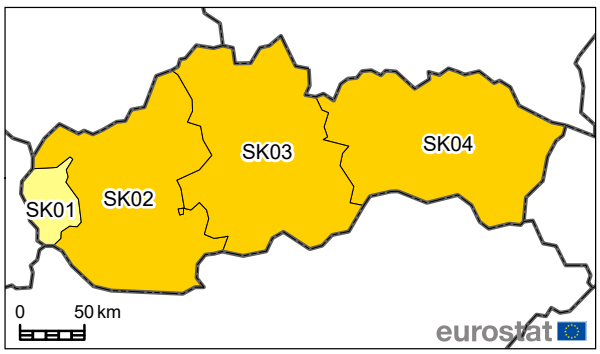
NUTS	Region	RII	Rank	Group	Change
SI03	Vzhodna Slovenija	70.6	153	Moderate	-13.6
SI04	**Zahodna Slovenija**	87.3	117	Moderate +	-15.2

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Slovenia is a Moderate Innovator and includes two regions.

Zahodna Slovenija (SI04) is a Moderate + Innovator, *Vzhodna Slovenija* (SI03) is a Moderate + Innovator. Performance has decreased strongly for both regions.

SLOVAKIA



NUTS	Region	RII	Rank	Group	Change
SK01	**Bratislavský kraj**	88.5	114	Moderate +	3.5
SK02	Západné Slovensko	56.0	189	Moderate -	2.8
SK03	Stredné Slovensko	52.0	199	Moderate -	-5.1
SK04	Východné Slovensko	57.1	185	Moderate -	6.6

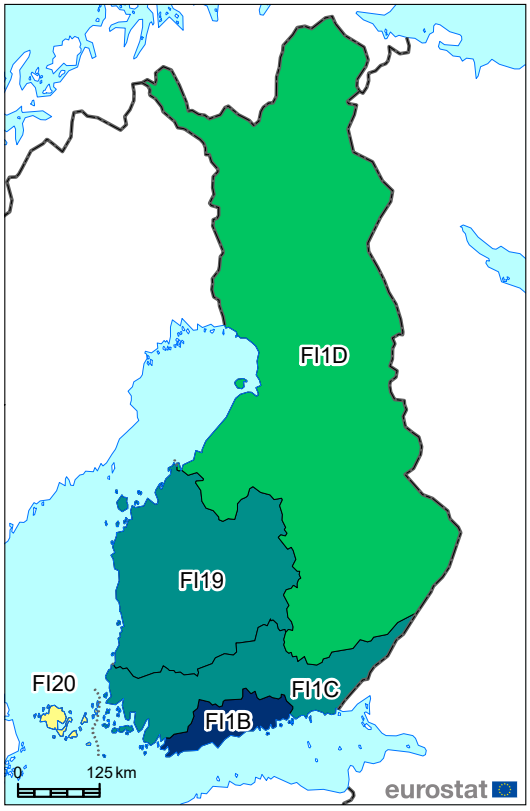
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Slovakia is a Moderate Innovator and includes four regions.

Bratislavský kraj (SK01), the capital region, is a Moderate + Innovator and the most innovative region in Slovakia. The other three regions are Moderate - Innovators.

Performance has increased strongly for three regions and decreased for one region: *Stredné Slovensko* (SK03).

FINLAND



NUTS	Region	RII	Rank	Group	Change
FI1B	**Helsinki-Uusimaa**	156.0	3	Leader +	12.8
FI1C	Etelä-Suomi	120.8	38	Leader -	10.3
FI19	Länsi-Suomi	124.5	28	Leader -	2.9
FI1D	Pohjois- ja Itä-Suomi	117.4	45	Strong +	10.7
FI20	Åland	76.7	141	Moderate +	-1.2

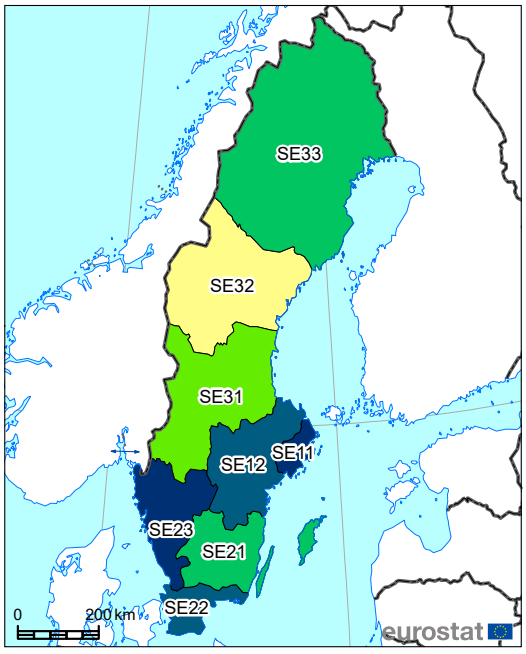
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Finland is an Innovation Leader and includes five regions.

The three southernmost regions are all Innovation Leaders. *Helsinki-Uusimaa* (FI1B) is an Innovation Leader +, *Etelä-Suomi* (FI1C) and *Länsi-Suomi* (FI19) are both Innovation Leader -. *Pohjois- ja Itä-Suomi* (FI1D) is a Strong + Innovator and *Åland* (FI20) is a Moderate + Innovator.

Performance has increased for four regions, most strongly for *Helsinki-Uusimaa* (FI1B). Performance has declined for *Åland* (FI20).

SWEDEN



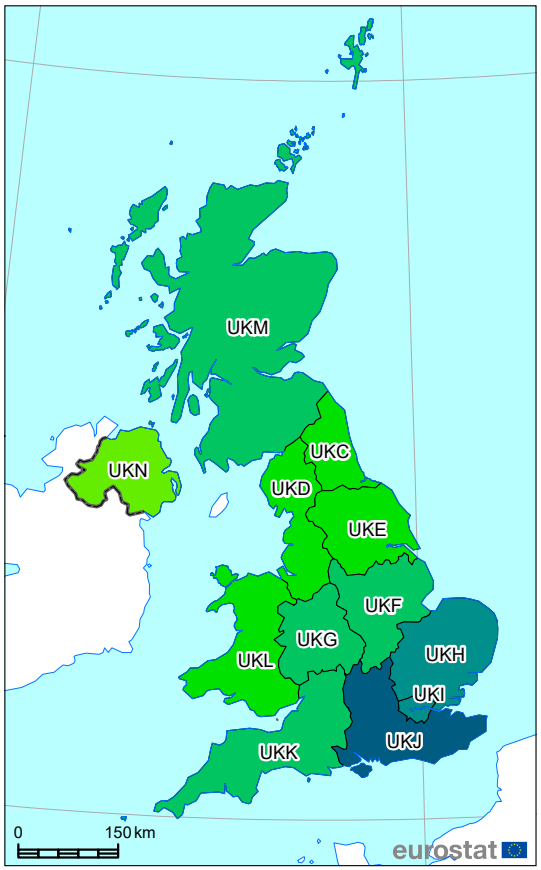
NUTS	Region	RII	Rank	Group	Change
SE11	**Stockholm**	153.8	4	Leader +	0.1
SE12	Östra Mellansverige	131.9	20	Leader	-7.5
SE21	Småland med öarna	111.6	60	Strong +	2.3
SE22	Sydsverige	137.0	13	Leader	-12.3
SE23	Västsverige	138.8	12	Leader +	2.9
SE31	Norra Mellansverige	90.8	110	Strong -	0.7
SE32	Mellersta Norrland	89.4	112	Moderate +	-6.4
SE33	Övre Norrland	114.6	53	Strong +	-5.1

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Sweden is an Innovation Leader and includes eight regions.

Stockholm (SE11), the capital region, is an Innovation Leader + and the most innovative region. *Sydsverige* (SE22) and *Västsverige* (SE23) are also Innovation Leaders +. *Östra Mellansverige* (SE12) is an Innovation leader. The other four regions are either Strong or Moderate Innovators. Performance has increased for four regions. Performance has decreased for four regions, most notably for *Sydsverige* (SE22).

UNITED KINGDOM



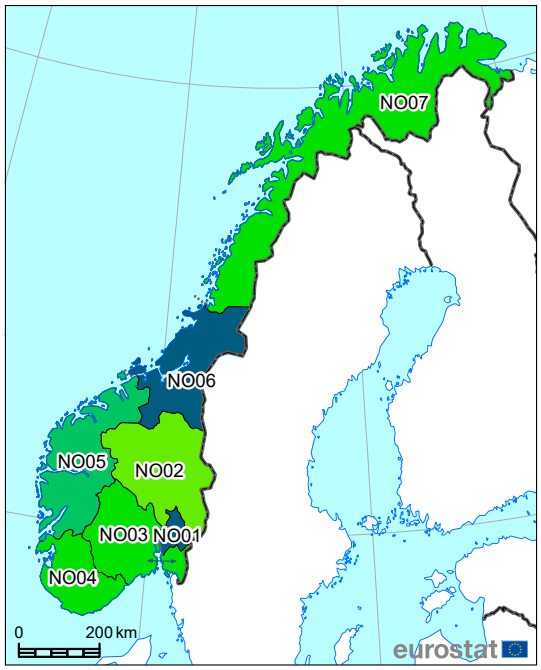
NUTS	Region	RII	Rank	Group	Change
UKC	North East	103.6	78	Strong	11.5
UKD	North West	105.8	72	Strong	5.8
UKE	Yorkshire and The Humber	107.5	67	Strong	16.4
UKF	East Midlands	112.2	57	Strong +	7.8
UKG	West Midlands	115.6	49	Strong +	22.5
UKH	East of England	123.2	30	Leader -	3.7
UKI	**London**	121.6	36	Leader -	10.6
UKJ	South East	129.9	22	Leader	14.0
UKK	South West	119.1	41	Strong +	10.6
UKL	Wales	106.3	69	Strong	16.6
UKM	Scotland	113.0	56	Strong +	10.8
UKN	Northern Ireland	92.3	104	Strong -	16.1

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

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

Three regions are Innovation Leaders, the other nine regions are Strong Innovators. The most innovative region is *South East* (UKJ). Performance has increased for all regions, most strongly for *West Midlands* (UKG), *Wales* (UKL) and *Yorkshire and the Humber* (UKE).

NORWAY



NUTS	Region	RII	Rank	Group	Change
NO01	**Oslo og Akershus**	135.6	16	Leader	17.0
NO02	Hedmark og Oppland	91.2	108	Strong -	22.1
NO03	Sør-Østlandet	103.0	81	Strong	18.1
NO04	Agder og Rogaland	108.8	66	Strong	18.1
NO05	Vestlandet	117.3	46	Strong +	18.5
NO06	Trøndelag	136.8	15	Leader	18.2
NO07	Nord-Norge	106.0	70	Strong	34.2

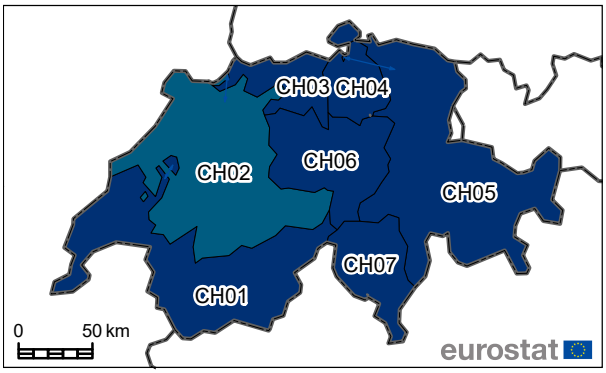
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Norway is a Strong Innovator and includes seven regions.

Trøndelag (NO06) and *Oslo og Akershus* (NO01), the capital region, are both Innovation Leaders and within the top-25 of most innovative European regions. The other regions are all Strong Innovators.

Performance has increased for all regions, most notably for *Nord-Norge* (NO07). These strong increases can be attributed to higher performance on the indicators using CIS data.

SWITZERLAND



NUTS	Region	RII	Rank	Group	Change
CH01	Région lémanique	140.7	10	Leader +	-0.4
CH02	**Espace Mittelland**	134.8	17	Leader	6.0
CH03	Nordwestschweiz	149.6	7	Leader +	-9.0
CH04	Zürich	160.1	1	Leader +	-6.5
CH05	Ostschweiz	150.2	6	Leader +	14.1
CH06	Zentralschweiz	146.1	8	Leader +	-3.5
CH07	Ticino	156.8	2	Leader +	17.5

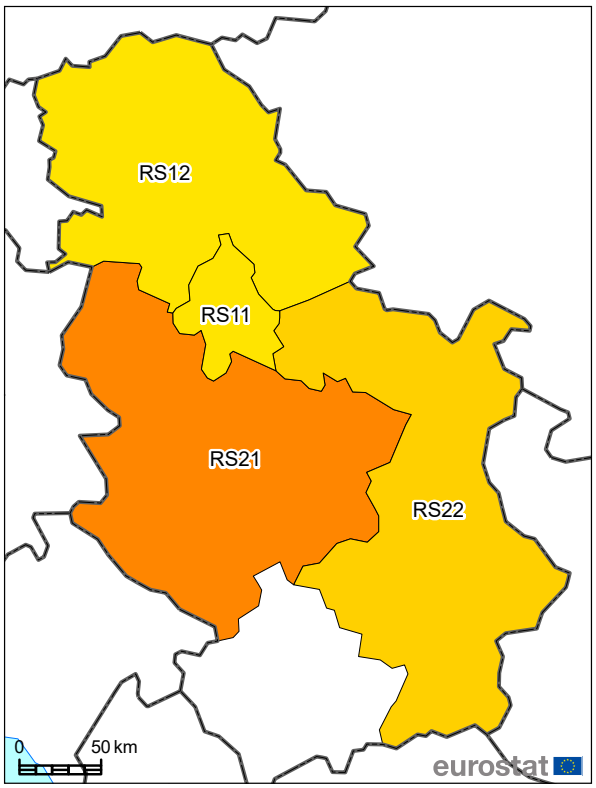
RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

Switzerland is an Innovation Leader and includes seven regions.

Six Swiss regions are Innovation Leaders +, performing more than 40% above the EU average. The most innovative region is *Zürich* (CH04), performing 60% above the EU average. All regions are within the top-20 of most innovative European regions, and five regions are within the top-10.

Performance has increased for three regions, most notably for *Ticino* (CH07) and *Ostschweiz* (CH05). Performance has decreased for four regions, most notably for *Nordwestschweiz* (CH03).

SERBIA



NUTS §	Region	RII	Rank	Group	Change
RS11	**Belgrade**	65.6	164	Moderate	17.9
RS12	Vojvodina	62.2	170	Moderate	21.6
RS21	Šumadija and Western Serbia	48.9	211	Modest +	11.1
RS22	Southern and Eastern Serbia	50.6	209	Moderate -	16.4

RII: performance in 2019 relative to that of the EU in 2019. Rank: rank performance in 2019 across all regions. Group: respective performance group. Change: performance change over time calculated as the difference between the performance in 2019 (RII2019) relative to that of the EU in 2011 and performance in 2011 (RII2011) relative to that of the EU in 2011.

§ 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 a Moderate Innovator and includes four regions.

Three regions are Moderate Innovators, with *Belgrade* (RS11) and *Vojvodina* (RS12) the most innovative regions. *Šumadija* and *Western Serbia* (RS21) is a Modest + Innovator.

Performance has increased strongly for all regions, most notably for *Vojvodina* (RS12).

3.4 Performance changes over time

Performance of regional innovation systems changes over time. Comparing performance between 2011 (RII2011) and 2019 (RII 2019), 159 regions have improved their performance on regional innovation, and for 79 regions performance has worsened (**Table 10**). Where on average performance has increased for 67% of the regions, for the Innovation Leaders this share is 55%. For the Strong Innovators this share is 64%, for the Moderate Innovators it is 80%, and for the Modest Innovators it is 45%. The share of regions with increasing performance is larger than the share of regions with decreasing performance. The average rate of increase for such regions is 8.9%, which is above the corresponding average rate of decrease of 7.0%. 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.

Performance has increased for all regions in Austria, Belgium, Italy, Lithuania, the Netherlands, Norway, Portugal, Serbia and the United Kingdom, and for 50% or more of the regions in Croatia, Czechia, Finland, France, Greece, Hungary, Ireland, Poland, Slovakia, Spain and Sweden. Performance has decreased for all regions in Romania and Slovenia, and for more than 50% of regions in Bulgaria, Denmark, Germany and Switzerland.

Performance changes over time are visualised in **Figure 3** using colour codes for eight different categories of performance change. Performance has increased in all green coloured regions, with darker shades of green showing higher degrees of performance increases. Performance has decreased in all purple coloured regions, with darker shades of purple showing higher levels of performance decreases.

Performance has increased very strongly by more than 15% for 31 regions and has increased strongly between 5% and 10% for 31 regions (**Table 11**). For 29 regions, performance has declined strongly between -10% and -5%, and for 18 regions, performance has declined very strongly by more than 10%.

Performance changes over time are largely driven by strong average increases for International scientific co-publications and Trademark applications, but there are no general patterns across the regions as changes in indicator performance differ strongly between the regions. For the three groups of regions with declining performance however, lagging performance can partly be attributed to declining performance on the indicators using innovation survey data.

Table 10: Performance change over time by regional performance group

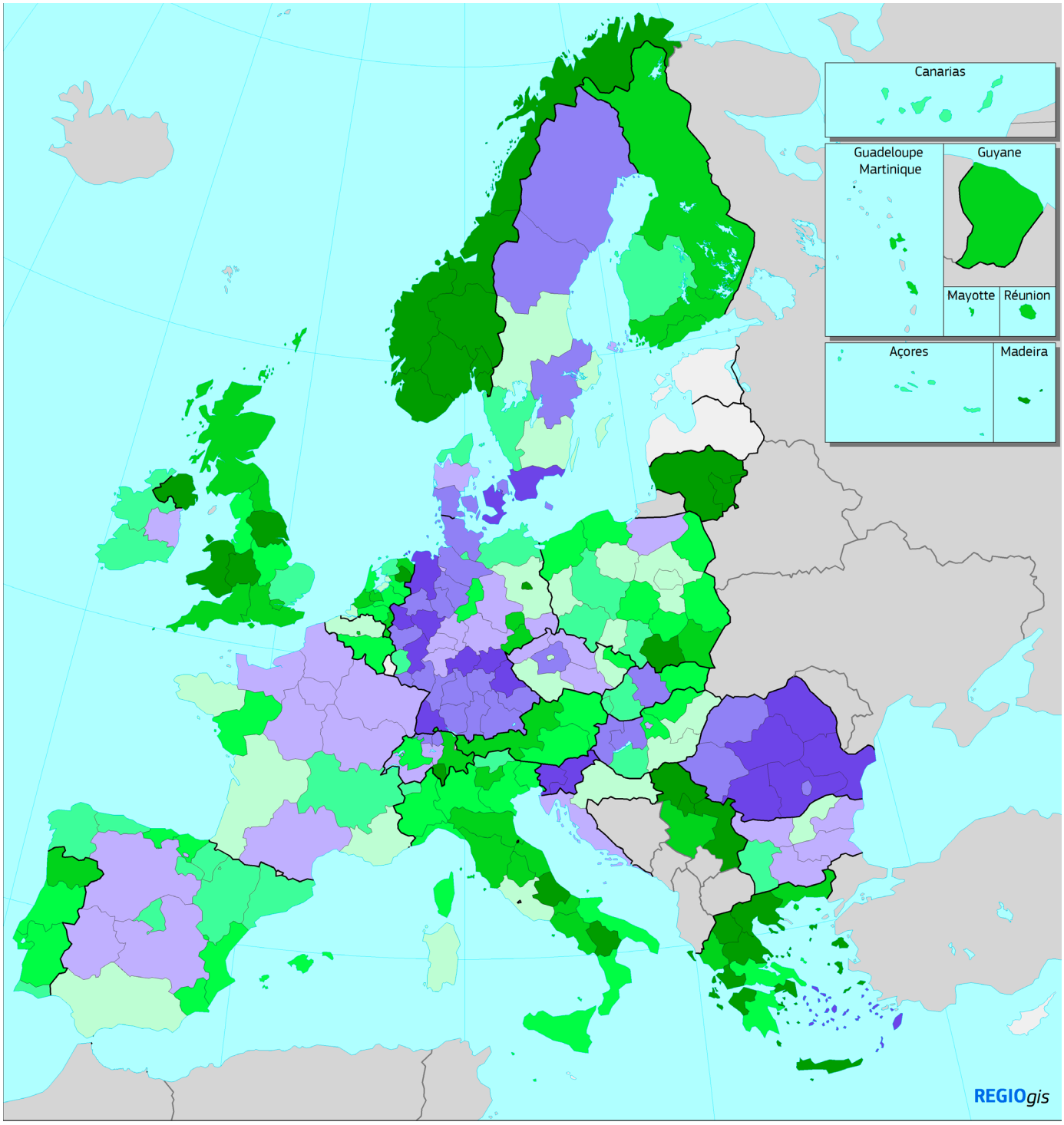
	All regions	Innovation Leaders	Strong Innovators	Moderate Innovators	Modest Innovators
Performance increase	159	21	47	78	13
Performance decrease	79	17	26	20	16
	238	38	73	98	29

Table 11: Performance change over time by regional performance group

Decrease	Regions	Increase	Regions
Below -10%	18	Between 0% and 2.5%	26
Between -10% and -5%	29	Between 2.5% and 5%	30
Between -5% and 0%	32	Between 5% and 10%	41
		Between 10% and 15%	31
		Above 15%	31

[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 2011, the spread was 0.399, for the year measured by the RII 2015, the spread was 0.405 or a 1.6% increase, for the year measured by the RII 2019, the spread was 0.374, a decrease compared to both the RII 2015 and RII 2011.

Figure 3: Innovation performance change 2011-2019



Innovation performance change 2011-2019

%

- < -10
- -10 - -2.5
- -2.5 - 0
- 0 - 2.5
- 2.5 - 5
- 5 - 10
- 10 - 15
- > 15

Source: European Commission - Regional Innovation Scoreboard 2019

4. Performance maps per indicator

For each of the indicators used in the RIS 2019, regional performance is shown in geographical maps. Regions are grouped according to their performance relative to the EU average using the same thresholds applied in Section 3 of this report. For each indicator, the top-40 best performing regions are listed.[9]

The distribution of relative performance scores varies strongly across indicators. For instance, almost 80 regions perform above 120% of the EU average on SMEs with marketing or organizational innovations or SMEs innovating in-house (**Table 12**). By contrast, more than 80 regions perform below 50% of the EU average on Public-private co-publications and Trademark applications. These differences reflect the fact that most indicator scores are not symmetrically distributed with equal shares of regions having high and low scores.

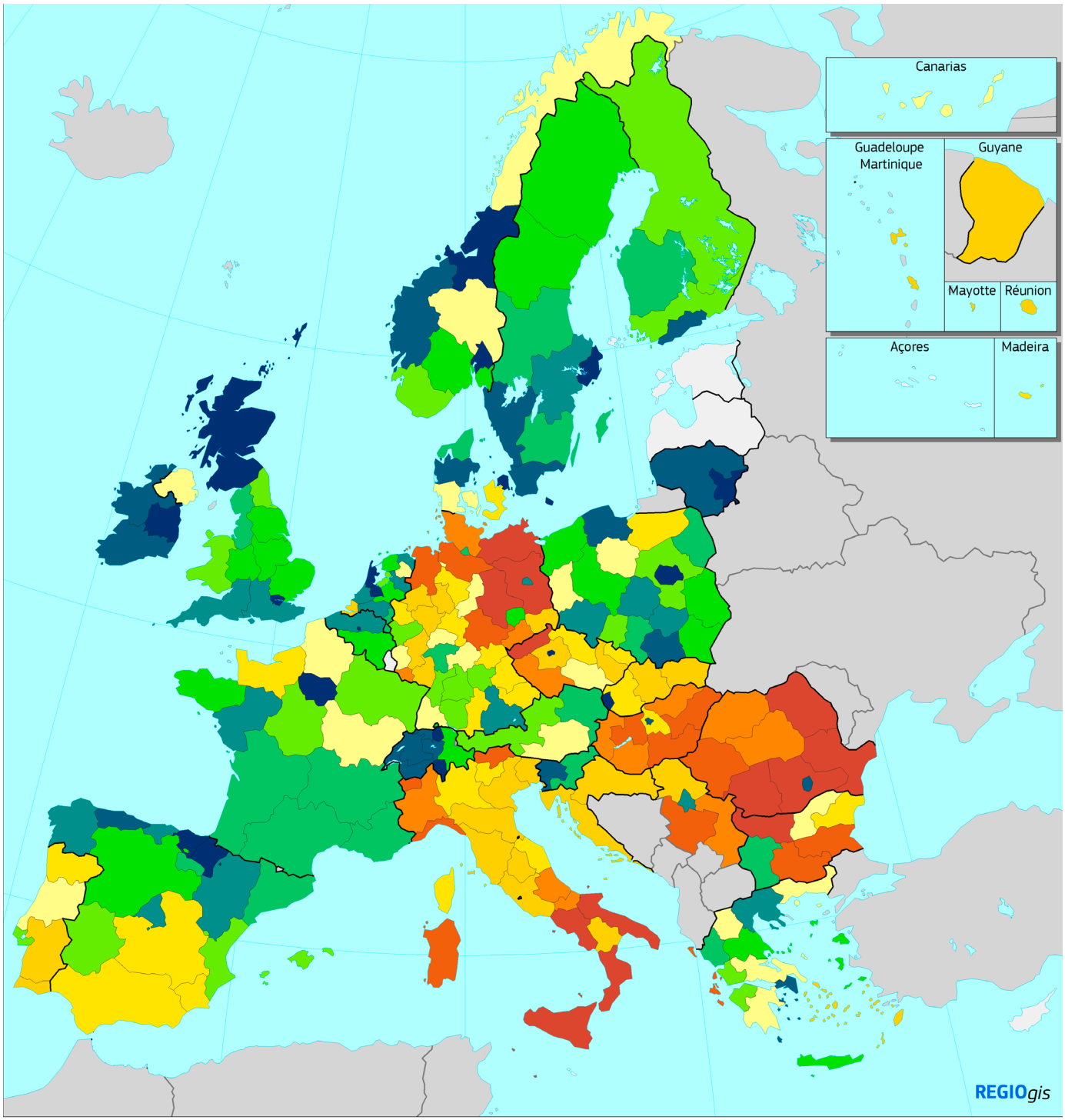
Table 12: Number of regions in different performance groups per indicator

	Performance above 120% of EU	Performance between 90% and 120% of EU	Performance between 50% and 90% of EU	Performance below 50% of EU
RII2019	**38**	**73**	**97**	**30**
Population having completed tertiary education[1]	58	62	74	42
Lifelong learning	70	26	86	56
International scientific co-publications	50	55	88	45
Top 10% most-cited publications	26	83	74	55
R&D expenditure in the public sector	42	59	96	41
R&D expenditure in the business sector	31	51	90	66
Non-R&D innovation expenditure[4]	89	68	61	13
SMEs with product or process innovations	71	88	36	43
SMEs with marketing or organisational innovations	78	65	55	40
SMEs innovating in-house	79	82	27	50
Innovative SMEs collaborating with others	65	39	59	75
Public-private co-publications	52	38	62	86
PCT patent applications[4]	50	34	52	95
Trademark applications[2]	48	42	63	82
Design applications[3]	45	45	80	62
Employment in medium-high/high-tech manufacturing and knowledge-intensive services[5]	55	59	74	33
Sales of new-to-market and new-to-firm innovations	24	77	110	27

1 Data missing for two regions;
2 Data missing for three regions;
3 Data missing for six regions;
4 Data missing for seven regions;
5 Data missing for 15 regions.

[9] Cyprus, Estonia, Latvia, Luxembourg and Malta, are excluded from the top-40 listings, although they might score highly on some indicators.

Percentage population aged 30-34 having completed tertiary education



Percentage of population aged 30-34 having completed tertiary education

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

Percentage population aged 30-34 having completed tertiary education

Tertiary education is not uniformly spread within each country. For instance, Tertiary education is below the EU average for most regions in Germany. For only three German regions, it is above the EU average. Tertiary education is relatively weak in Croatia, Czechia, Hungary, Italy, Portugal, Romania and Slovakia. In many countries, performance is highest in capital regions, a direct result of above-average shares of employment in both public and private services, which typically employ more people with a tertiary degree.

The top 40 best performing regions are shown on the right. Most regions belonging to the top 10 comprise of capital city regions, which are *Sostinės regionas* (LT01), *Warszawski stoleczny* (PL91), *London* (UKI), *Hovedstaden* (DK01), *Oslo og Akershus* (NO01), *Stockholm* (SE11), *Bratislavský kraj* (SK01) and *Praha* (CZ01).

Eastern European capital city-regions perform very well, given *Warszawski stoleczny* (PL91) in Poland and *Sostinės regionas* (LT01) in Lithuania, both scoring 117.6% above the EU average.

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 30 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.

Missing data: Região Autónoma dos Açores (PT20) and Aland (FI20).

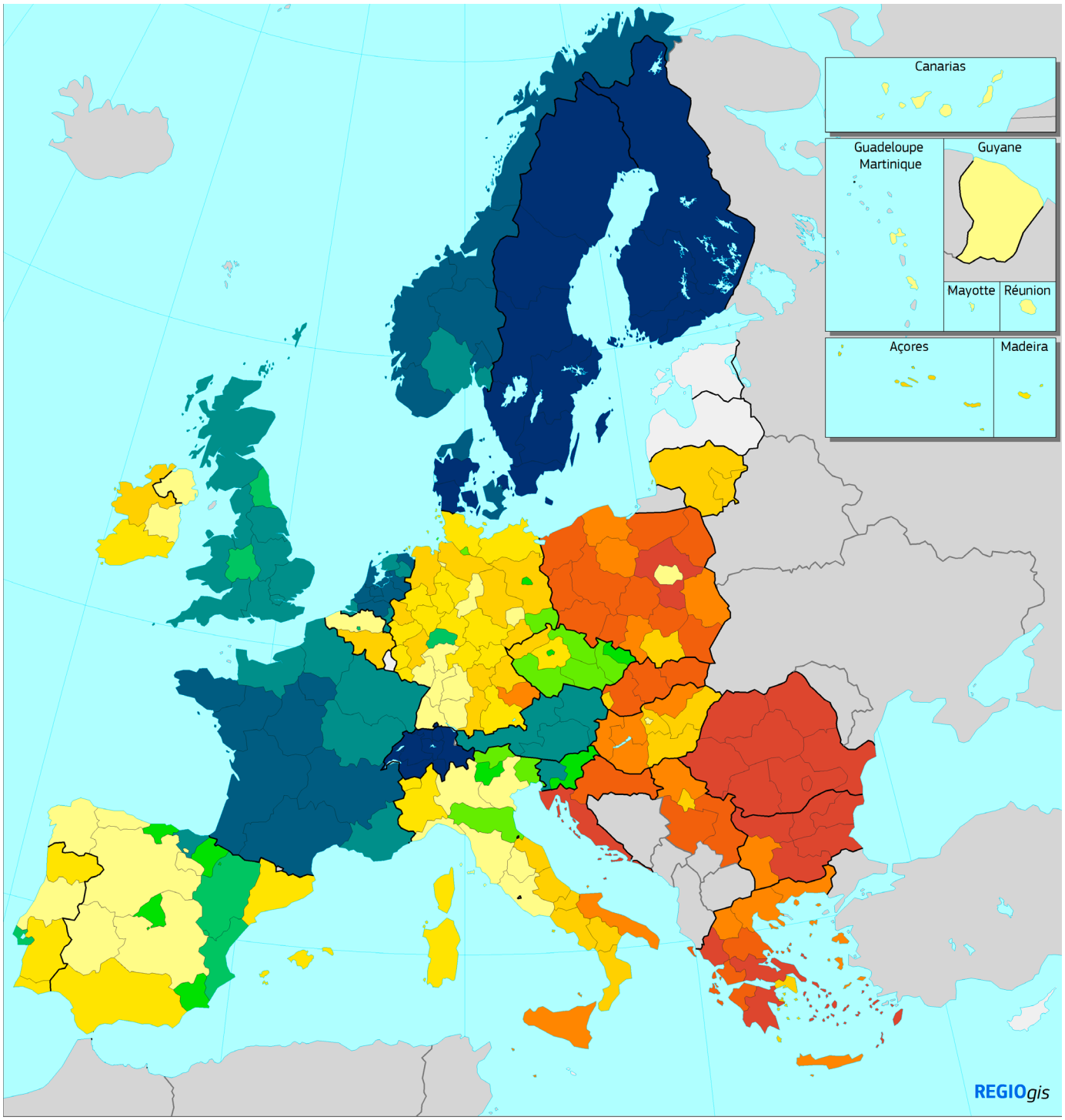
Top 40 regions

*Most recent performance 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*

	Region	
1	Warszawski stoleczny (PL91)	217.6*
	Sostinės regionas (LT01)	217.6*
3	London (UKI)	202.0
4	Zürich (CH04)	196.5
5	Hovedstaden (DK01)	187.5
6	Oslo og Akershus (NO01)	187.1
7	Stockholm (SE11)	185.9
8	Bratislavský kraj (SK01)	183.2
9	Utrecht (NL31)	178.9
10	Praha (CZ01)	177.7
11	Île de France (FR1)	176.6
12	Eastern and Midland (IE06)	170.3
13	Scotland (UKM)	168.8
14	Noord-Holland (NL32)	163.3
15	País Vasco (ES21)	159.4
16	Ticino (CH07)	157.4
17	Région de Bruxelles-Capitale (BE1)	156.6
18	Trøndelag (NO06)	155.9
19	Comunidad Foral de Navarra (ES22)	155.5
20	Zentralschweiz (CH06)	152.3
21	Région lémanique (CH01)	151.2
22	Sydsverige (SE22)	149.6
23	Helsinki-Uusimaa (FI1B)	149.2
24	Northern and Western (IE04)	147.7
25	Bucuresti - Ilfov (RO32)	146.1
26	Budapest (HU11)	144.9
27	Vidurio ir vakarų Lietuvos regionas (LT02)	144.5
28	Vestlandet (NO05)	143.0
29	Principado de Asturias (ES12)	142.2
30	Zahodna Slovenija (SI04)	141.0
31	Attiki (EL30)	140.6
	Espace Mittelland (CH02)	140.6
33	Västsverige (SE23)	139.8
34	Southern (IE05)	138.3
35	Malopolskie (PL21)	135.5
36	Midtjylland (DK04)	134.4
	Nordwestschweiz (CH03)	134.4
	Pomorskie (PL63)	134.4
39	Oberbayern (DE21)	132.8
40	Pays de la Loire (FRG)	132.4

* Regions ordered based on their scores before removing statistical outliers.

Percentage population aged 25-64 participating in lifelong learning



Percentage of population aged 25-64 involved in lifelong learning

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

Percentage population aged 25-64 participating in lifelong learning

Lifelong learning is less spread within countries but more across countries. Particularly regions in Northern Europe – Denmark, Norway, Sweden, and Finland are in the group of high performers. In Central and Western Europe, regions in the UK, the Netherlands, France, Switzerland and Austria score high on lifelong learning. Participation in lifelong learning is more dispersed in other countries. *País Vasco* (ES21) in Spain for instance belongs to the bottom one-third high performers, whereas *Cataluña* (ES51) and *Andalucía* (ES61) are middle one-third moderate performers. Other regions in Spain have been ranked as top one-third moderate performers, middle and top one-third strong performers.

The top 40 best performing regions are shown on the right. Swiss and Swedish regions dominate the top 20. All regions in both Switzerland and Sweden score equal to or above 148.5% of the EU average. A large score gap is observed between the top 2 – *Zürich* (CH04) and *Zentralschweiz* (CH03), having an equal to or more than 218.4% above EU average -, and the middle and bottom top 5 – *Nordwestschweiz* (CH03), *Stockholm* (SE11), and *Sydsverige* (SE22), scoring an equal to or below 203.9% above EU average.

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.

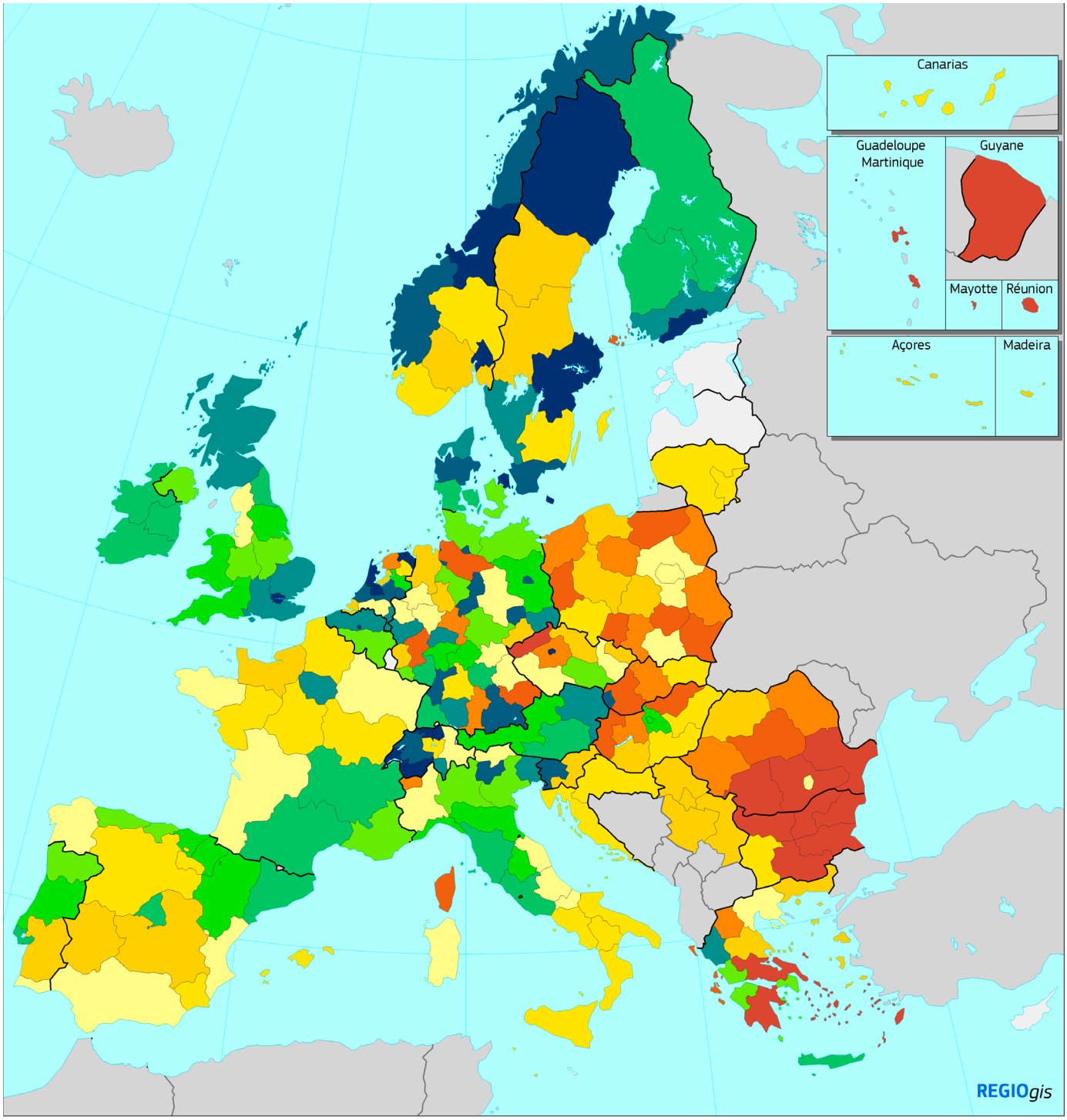
Rationale: Lifelong learning encompasses all purposeful learning activity, whether formal, non-formal or informal, undertaken on an ongoing basis with the aim of improving knowledge, skills and competence. The intention or aim to learn is the critical point that distinguishes these activities from non-learning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

Top 40 regions

*Most recent performance 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*

	Region	
1	Zürich (CH04)	320.7
2	Zentralschweiz (CH06)	318.4
3	Nordwestschweiz (CH03)	303.9
4	Stockholm (SE11)	301.0
	Sydsverige (SE22)	301.0
6	Västsverige (SE23)	298.1
7	Espace Mittelland (CH02)	293.2
	Östra Mellansverige (SE12)	293.2
9	Hovedstaden (DK01)	291.3
10	Helsinki-Uusimaa (FI1B)	289.3
11	Ostschweiz (CH05)	287.4
12	Småland med öarna (SE21)	265.0
13	Norra Mellansverige (SE31)	264.1
14	Région lémanique (CH01)	262.1
15	Övre Norrland (SE33)	261.2
16	Mellersta Norrland (SE32)	258.3
17	Länsi-Suomi (FI19)	250.5
18	Ticino (CH07)	248.5
19	Etelä-Suomi (FI1C)	247.6
	Midtjylland (DK04)	247.6
21	Pohjois- ja Itä-Suomi (FI1D)	240.8
22	Syddanmark (DK03)	235.0
23	Åland (FI20)	232.0
24	Sjælland (DK02)	229.1
25	Nordjylland (DK05)	226.2
26	Auvergne - Rhône-Alpes (FRK)	223.3
27	Oslo og Akershus (NO01)	212.6
28	Utrecht (NL31)	205.8
29	Pays de la Loire (FRG)	203.9
30	Groningen (NL11)	202.9
	Languedoc-Roussillon – Midi-Pyrénées (FRJ)	202.9
32	Trøndelag (NO06)	195.1
33	Bretagne (FRH)	194.2
34	Noord-Holland (NL32)	192.2
35	Nord-Norge (NO07)	188.3
36	Zuid-Holland (NL33)	186.4
37	Aquitaine - Limousin – Poitou-Charentes (FRI)	185.4
38	Vestlandet (NO05)	184.5
39	Gelderland (NL22)	180.6
40	Flevoland (NL23)	179.6

International scientific co-publications per million population



International scientific co-publications per million population

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

International scientific co-publications per million population

Regional performance on International scientific co-publication shows a large degree of variation within countries. Germany, Greece and the Netherlands have the highest degree of variety, as German regions are ranked as middle one-third low performers to middle one-third high performers, Greek regions as bottom one-third low performers to bottom one-third high performers, and Dutch regions as top one-third low performers to top one-third high performers. However, a couple of countries, including Ireland and Croatia, show no regional variety. All regions in Ireland - *Northern and Western* (IE04), *Southern* (IE05), and *Eastern and Midland* (IE06) - belong to the top one-third performers. Similarly, *Jadranska Hrvatska* (HR03) and *Kontinentalna Hrvatska* (HR04) in Croatia are both middle one-third moderate performers.

The top 40 best performing regions are shown on the right. Capital city-regions dominate the top 40, although the best three performing regions are non-capital city regions. Strong regional performance is linked to the presence of universities which are more frequent and of larger size in metropolitan areas.

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.

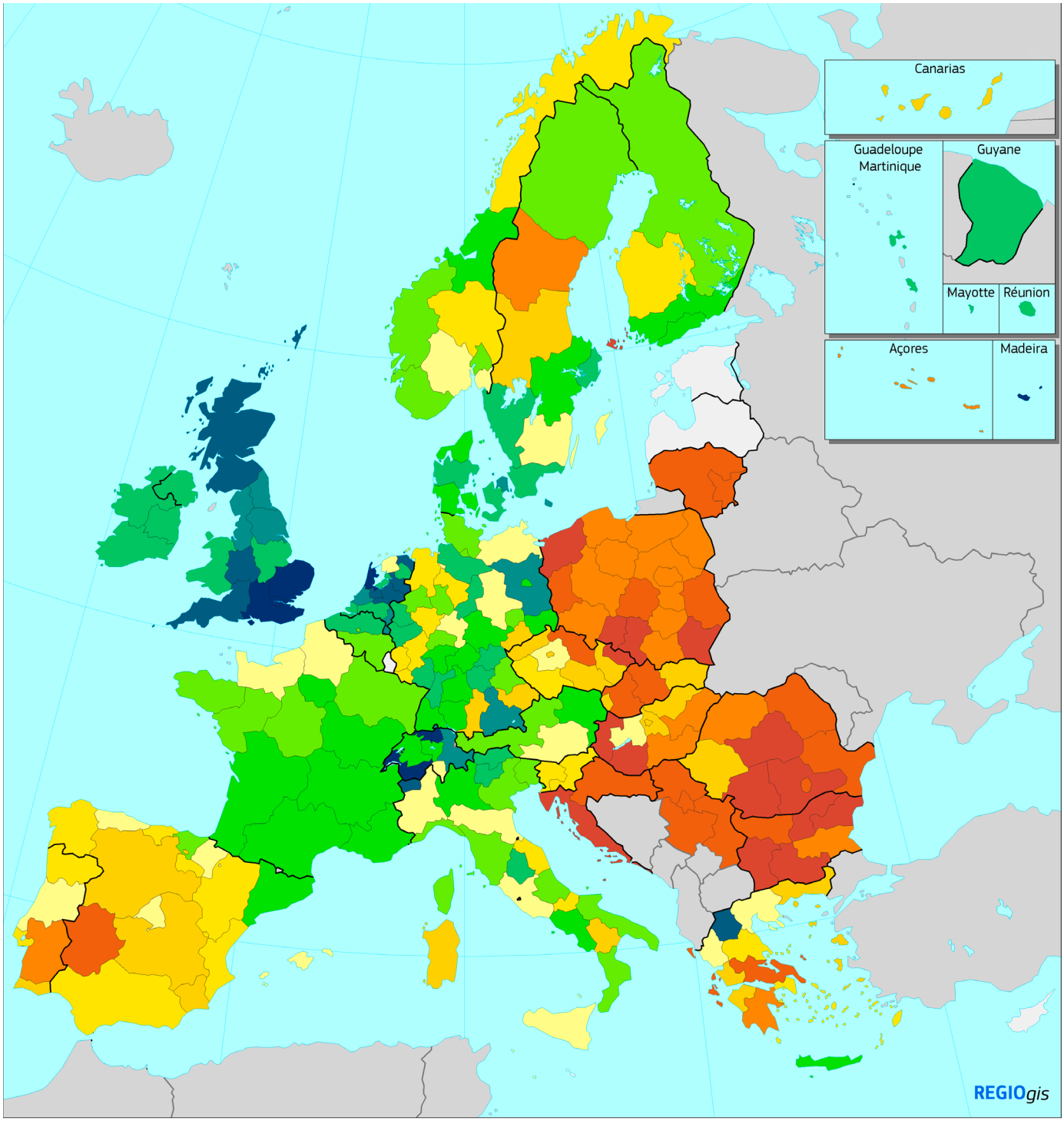
Top 40 regions

*Most recent performance 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*

	Region	
1	Zürich (CH04)	174.5*
	Région lémanique (CH01)	174.5*
	Groningen (NL11)	174.5*
	Hovedstaden (DK01)	174.5*
	Nordwestschweiz (CH03)	174.5*
	Trøndelag (NO06)	174.5*
	Oslo og Akershus (NO01)	174.5*
	Utrecht (NL31)	174.5*
	Stockholm (SE11)	174.5*
	Övre Norrland (SE33)	174.5*
	Région de Bruxelles-Capitale (BE1)	174.5*
	Praha (CZ01)	174.5*
	Östra Mellansverige (SE12)	174.5*
14	Helsinki-Uusimaa (FI1B)	166.1
15	Noord-Holland (NL32)	159.5
16	London (UKI)	159.2
17	Gelderland (NL22)	155.1
18	Karlsruhe (DE12)	153.7
19	Sydsverige (SE22)	152.2
20	Vestlandet (NO05)	149.5
21	Nord-Norge (NO07)	149.2
22	Midtjylland (DK04)	148.9
23	Provincia Autonoma Trento (ITH2)	148.7
24	Bremen (DE50)	147.3
25	Zuid-Holland (NL33)	147.2
26	Bratislavský kraj (SK01)	144.3
27	Zahodna Slovenija (SI04)	144.1
28	Berlin (DE30)	143.5
29	Espace Mittelland (CH02)	143.3
30	Leipzig (DED5)	142.7
31	Braunschweig (DE91)	141.8
32	Hamburg (DE60)	141.2
33	Oberbayern (DE21)	138.2
34	Dresden (DED2)	137.8
35	Limburg (NL42)	137.6
36	Scotland (UKM)	137.5
37	Friuli-Venezia Giulia (ITH4)	136.3
38	Etelä-Suomi (FI1C)	136.1
39	Ostösterreich (AT1)	135.3
	South East (UKJ)	135.3

* Regions ordered based on their scores before removing statistical outliers.

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



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

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

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

Scientific publications among the top-10 % most cited are less spread within countries but more across countries. Many regions in Northern, Western and Central European countries - Denmark, Norway, Sweden, Finland, Ireland, France, Germany, Belgium, and Austria respectively - are ranked as bottom, middle and top one-third strong performers. A notable exception to this trend are the United Kingdom, Switzerland and the Netherlands, where the majority of regions consist of bottom, middle and top one-third high performers. While there might be a relatively small variety among regions in many European countries, Greek regions show the highest level of variety with regard to the top-10% most cited publications. *Dytiki Makedonia* (EL53) is a middle one-third high performer, whereas *Sterea Ellada* (EL64) is a middle one-third low performer.

The top 40 best performing regions are shown on the right. A comparison between the top 10 and top 20 shows that the United Kingdom is strongly represented in both rankings, as four out of 12 UK regions are in the top 10 and seven out of 12 in the top 20. Swiss and Dutch regions have high scores as well and comprise, together with UK regions, the top 10. *Madeira* (PT30), a Portuguese autonomous region, scores 38.7% above EU average and ranks seventh, which makes it the only Southern European region represented in the top 10.

Definition of the indicator

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

Denominator: Total number of scientific publications.

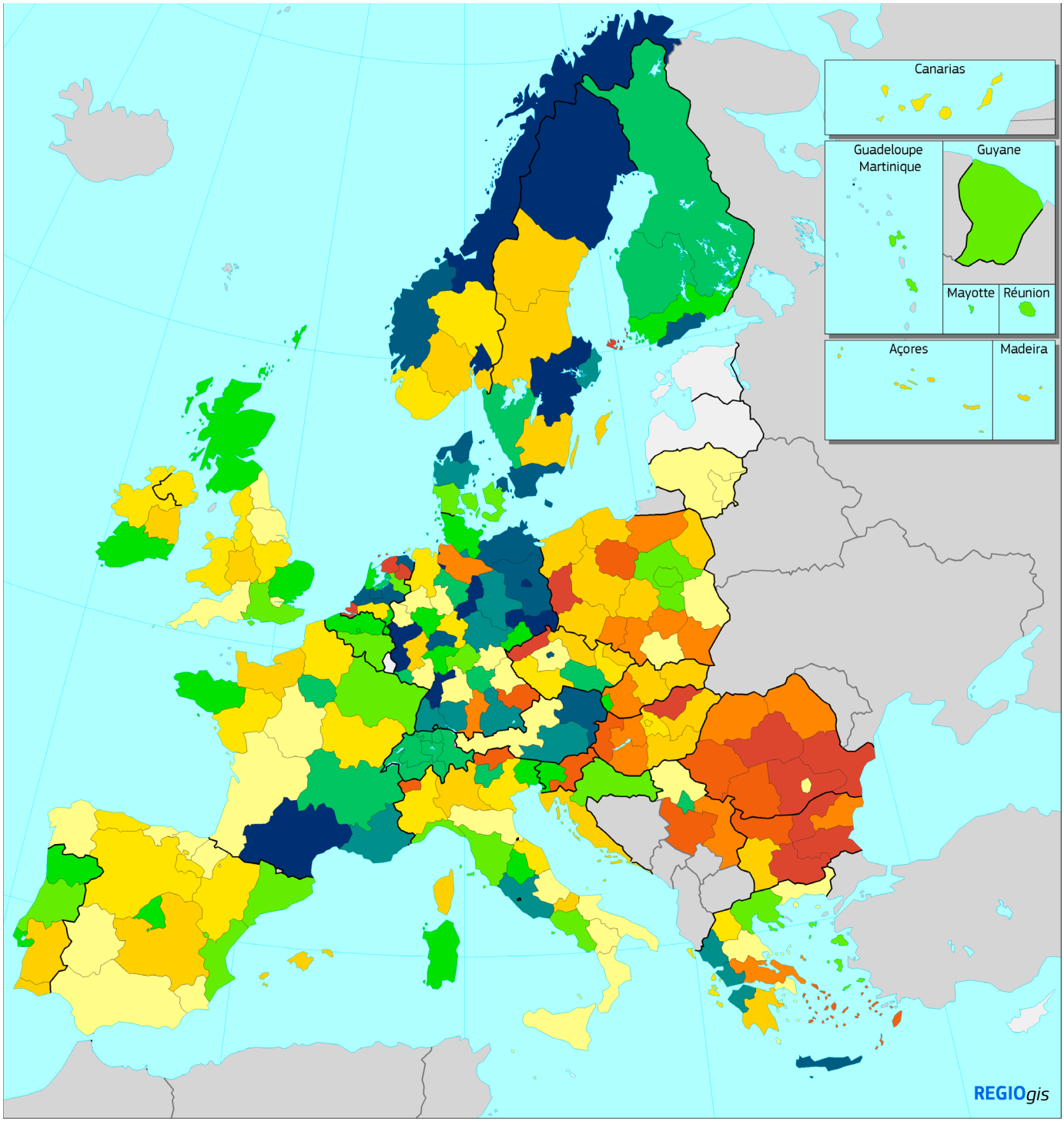
Rationale: The indicator is a measure for the efficiency of the research system as highly cited publications are assumed to be of higher quality. There could be a bias towards small or English-speaking countries given the coverage of Scopus' publication data.

Top 40 regions

*Most recent performance 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*

	Region	
1	East of England (UKH)	163.0
2	Zürich (CH04)	155.8
3	London (UKI)	150.8
4	Nordwestschweiz (CH03)	140.5
5	South East (UKJ)	140.3
6	Région lémanique (CH01)	139.5
7	Região Autónoma da Madeira (PT30)	138.7
8	Noord-Holland (NL32)	138.2
9	Utrecht (NL31)	137.6
10	South West (UKK)	136.6
11	Gelderland (NL22)	136.1
12	West Midlands (UKG)	135.1
13	Valle d'Aosta/Vallée d'Aoste (ITC2)	134.6
14	Dytiki Makedonia (EL53)	132.4
15	Scotland (UKM)	130.4
16	Groningen (NL11)	128.2
17	Overijssel (NL21)	127.7
18	Zuid-Holland (NL33)	126.9
19	Brandenburg (DE40)	126.7
20	North East (UKC)	125.9
21	North West (UKD)	125.3
22	Hovedstaden (DK01)	123.4
23	Ostschweiz (CH05)	122.8
24	Yorkshire and The Humber (UKE)	122.4
25	Oberbayern (DE21)	121.4
26	Limburg (NL42)	120.9
27	Vlaams Gewest (BE2)	119.7
28	Noord-Brabant (NL41)	118.6
29	Flevoland (NL23)	117.7
30	Régions ultrapériphériques françaises (FRY)	117.6
31	Drenthe (NL13)	117.2
32	Provincia Autonoma Bolzano/Bozen (ITH1)	117.0
33	Västsverige (SE23)	116.5
34	Provincia Autonoma Trento (ITH2)	116.0
35	Sjælland (DK02)	116.0
36	Karlsruhe (DE12)	115.4
37	Stockholm (SE11)	114.9
38	Wales (UKL)	114.8
39	East Midlands (UKF)	114.6
40	Midtjylland (DK04)	113.9

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



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

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

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

High public R&D expenditure is observed in capital regions, but also in non-capital regions. Public R&D expenditures are particularly high in several regions in Germany, but also in France, Austria, Denmark, the Netherlands, Greece, Norway and Sweden. Positive outliers are seen in a couple of Eastern European countries, including *Warszawski stoleczny* (PL91) and *Mazowiecki regionalny* (PL92) in Poland, which rank both as bottom one-third strong performers. *Praha* (CZ01) in Czechia belongs to the top one-third high performers. Other Eastern European regions that do well are *Jihovýchod* (CZ06) in Czechia and *Belgrade* (RS11) in Serbia, as they are considered to be top one-third strong performers.

The top 40 best performing regions are shown on the right. German regions dominate the top 10, since seven out of ten regions are German. Two Norwegian regions - *Trøndelag* (NO06) and *Oslo og Akershus* (NO01), and one Swedish region - *Övre Norrland* (SE33) – managed to get into the top 10 as well.

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.

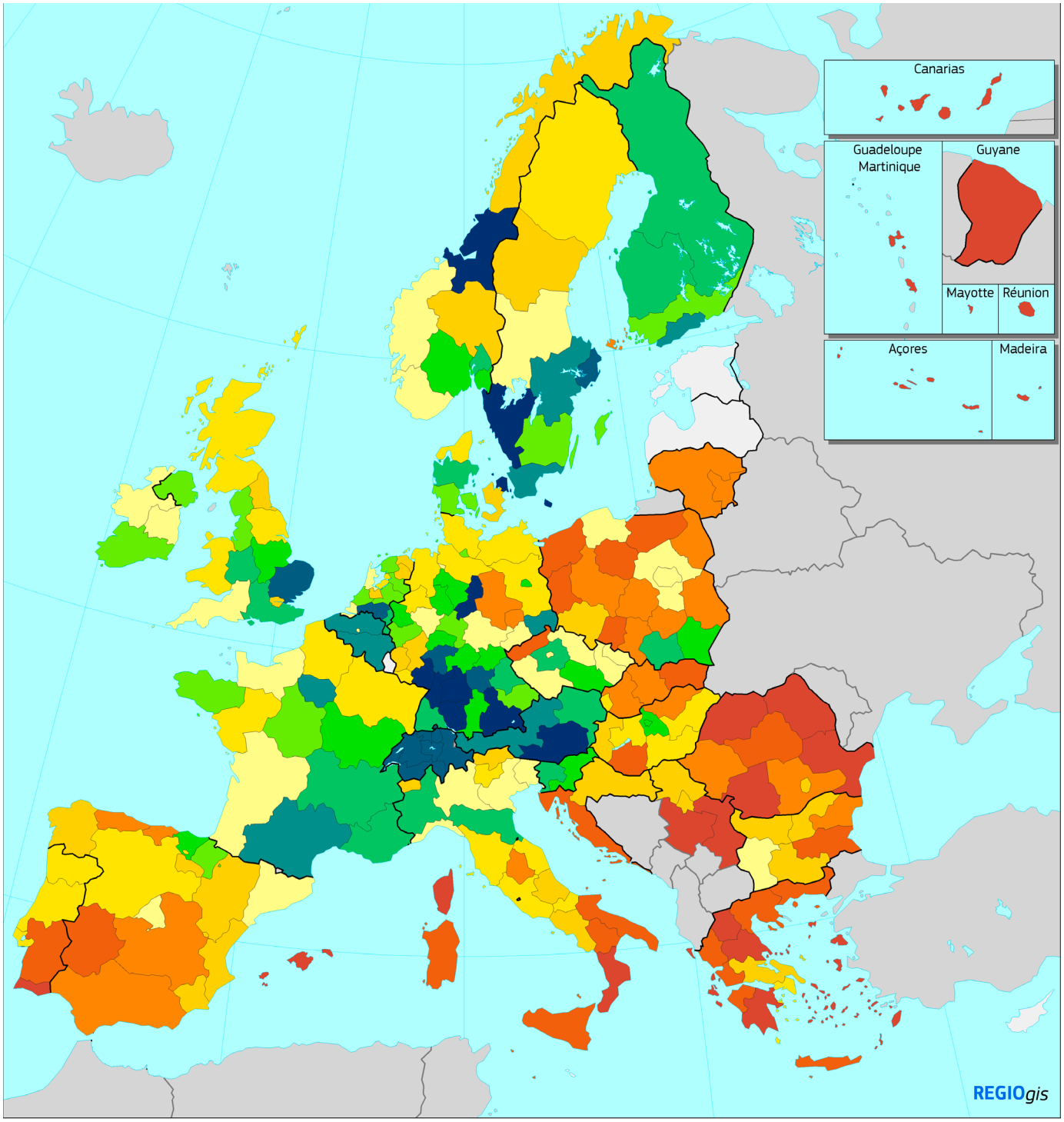
Top 40 regions

*Most recent performance 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*

	Region	
1	Trier (DEB2)	175.1*
	Braunschweig (DE91)	175.1*
	Trøndelag (NO06)	175.1*
	Dresden (DED2)	175.1*
	Övre Norrland (SE33)	175.1*
	Berlin (DE30)	175.1*
7	Bremen (DE50)	168.4
8	Köln (DEA2)	163.2
9	Oslo og Akershus (NO01)	161.2
10	Karlsruhe (DE12)	158.9
11	Leipzig (DED5)	157.8
12	Östra Mellansverige (SE12)	157.6
13	Nord-Norge (NO07)	154.2
14	Languedoc-Roussillon – Midi-Pyrénées (FRJ)	153.8
15	Hovedstaden (DK01)	152.3
16	Groningen (NL11)	150.1
17	Utrecht (NL31)	146.8
18	Praha (CZ01)	144.7
19	Kriti (EL43)	140.9
20	Ostösterreich (AT1)	137.9
21	Sydsverige (SE22)	137.6
22	Mecklenburg-Vorpommern (DE80)	137.5
23	Vestlandet (NO05)	136.0
24	Gießen (DE72)	131.2
25	Helsinki-Uusimaa (FI1B)	130.5
26	Gelderland (NL22)	129.7
27	Zuid-Holland (NL33)	128.8
28	Brandenburg (DE40)	128.5
	Nordjylland (DK05)	128.5
30	Midtjylland (DK04)	127.9
	Sachsen-Anhalt (DEE0)	127.9
32	Oberbayern (DE21)	127.2
33	Thüringen (DEG0)	125.9
34	Dytiki Ellada (EL63)	124.7
	Ipeiros (EL54)	124.7
36	Südösterreich (AT2)	123.5
37	Freiburg (DE13)	123.2
38	Hamburg (DE60)	122.5
39	Lazio (ITI4)	121.8
40	Provence-Alpes-Côte d'Azur (FRL)	121.1

* Regions ordered based on their scores before removing statistical outliers.

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



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

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

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

Regions belonging to the top one-third performing group in Business R&D expenditures are located in just a few countries: Austria, Denmark, Germany, Norway and Sweden. Other regions in the group of high performers include all Swiss regions and all Belgian regions except *Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest* (BE1). Many regions classified as strong performers are to be found in France, the Netherlands, Slovenia and the United Kingdom. However, Czechia, Hungary, Ireland, Italy, Poland and Spain have a few outliers belonging to the strong performers group as well.

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) – make up the majority of the top 10. Swiss regions are overrepresented in the top 20. All Swiss regions score approximately one-third higher than the EU average.

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.

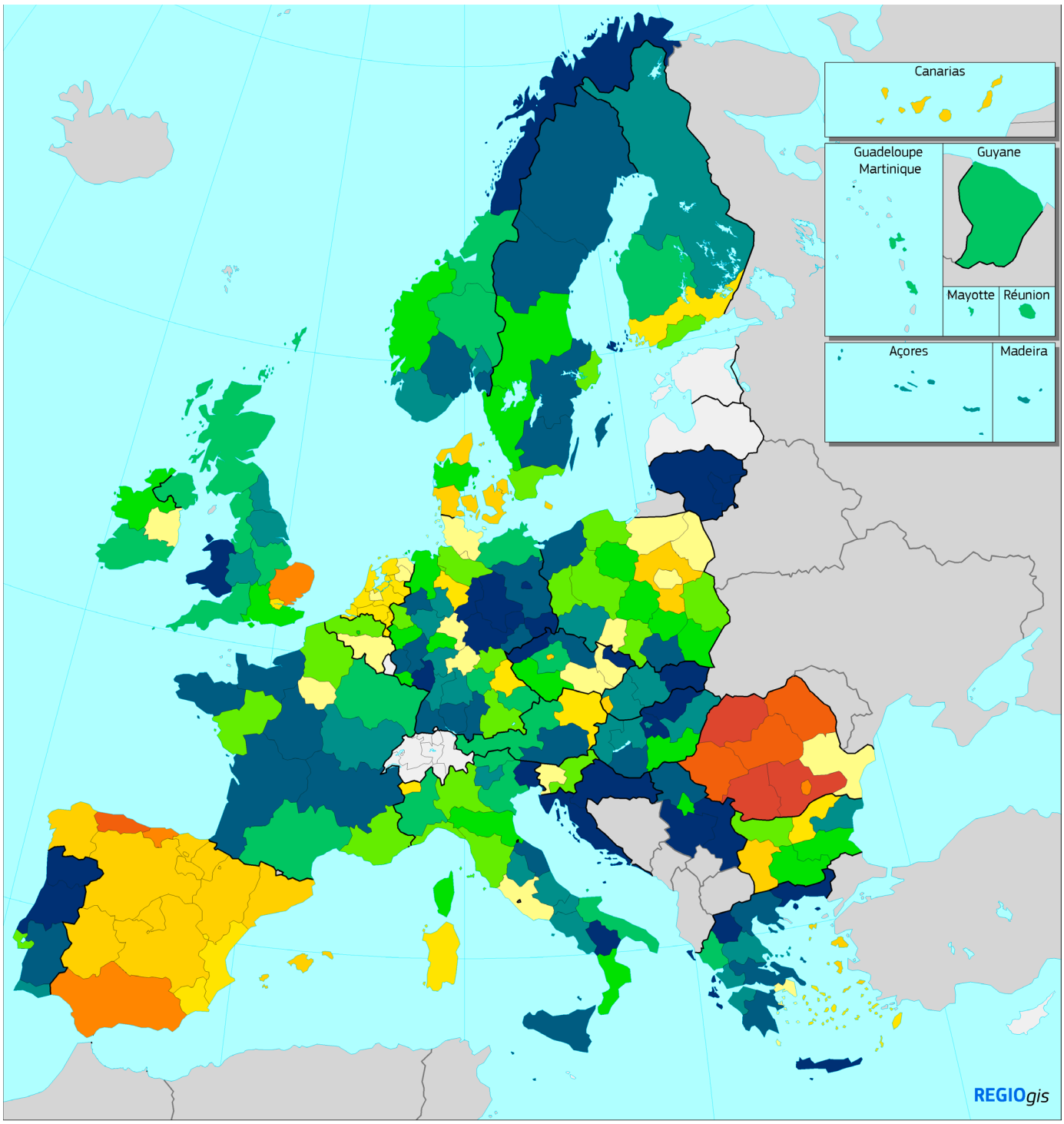
Top 40 regions

*Most recent performance 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*

	Region	
1	Braunschweig (DE91)	169.3*
	Stuttgart (DE11)	169.3*
	Südösterreich (AT2)	169.3*
4	Tübingen (DE14)	168.9
5	Hovedstaden (DK01)	166.9
6	Oberbayern (DE21)	162.4
7	Trøndelag (NO06)	155.3
8	Västsverige (SE23)	152.5
9	Karlsruhe (DE12)	151.8
10	Rheinhessen-Pfalz (DEB3)	150.7
11	Stockholm (SE11)	149.2
12	Mittelfranken (DE25)	148.5
13	Noord-Brabant (NL41)	146.0
14	East of England (UKH)	144.4
15	Darmstadt (DE71)	139.1
16	Région lémanique (CH01)	136.7
17	Espace Mittelland (CH02)	136.7
18	Nordwestschweiz (CH03)	136.7
19	Zürich (CH04)	136.7
20	Ostschweiz (CH05)	136.7
21	Zentralschweiz (CH06)	136.7
22	Ticino (CH07)	136.7
23	Östra Mellansverige (SE12)	135.8
24	Helsinki-Uusimaa (FI1B)	135.2
25	Languedoc-Roussillon - Midi-Pyrénées (FRJ)	132.0
26	Westösterreich (AT3)	128.6
27	Sydsverige (SE22)	125.7
28	Île de France (FR1)	124.1
29	Région Wallonne (BE3)	123.3
30	Vlaams Gewest (BE2)	122.6
31	Dresden (DED2)	120.7
32	Auvergne - Rhône-Alpes (FRK)	118.0
33	Piemonte (ITC1)	116.9
34	Länsi-Suomi (FI19)	114.4
35	Freiburg (DE13)	113.1
36	Malopolskie (PL21)	112.6
37	Ostösterreich (AT1)	112.2
38	West Midlands (UKG)	111.2
39	Zahodna Slovenija (SI04)	110.8
40	South East (UKJ)	110.8

* Regions ordered based on their scores before removing statistical outliers.

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



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

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

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

Regions with a high share of non-R&D innovation expenditures in SMEs are dispersed across the whole of Europe. Virtually every country has at least one high performing region except for Spain, the Netherlands and Romania. All regions in both Croatia and Lithuania are ranked as top one-third high performers. The majority of regions in Greece, Hungary, Portugal, Serbia and Slovakia comprise of bottom, middle and top one-third high performers. Half and just more than half of French, German, Italian, Norwegian, Swedish and UK regions are ranked in the high performers category, which shows that overall, countries with a smaller regional NUTS division tend to perform better on non-R&D innovation expenditures than countries with a large regional NUTS division.

The top 40 best performing regions are shown on the right. While the top 10 is primarily represented by Greek and Eastern European regions, the top 20 mainly consists of German and Eastern European regions. Nevertheless, *Wales* (UKL) is ranked as first due to its score, which is roughly more than twice the percentage of the European average.

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: 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.

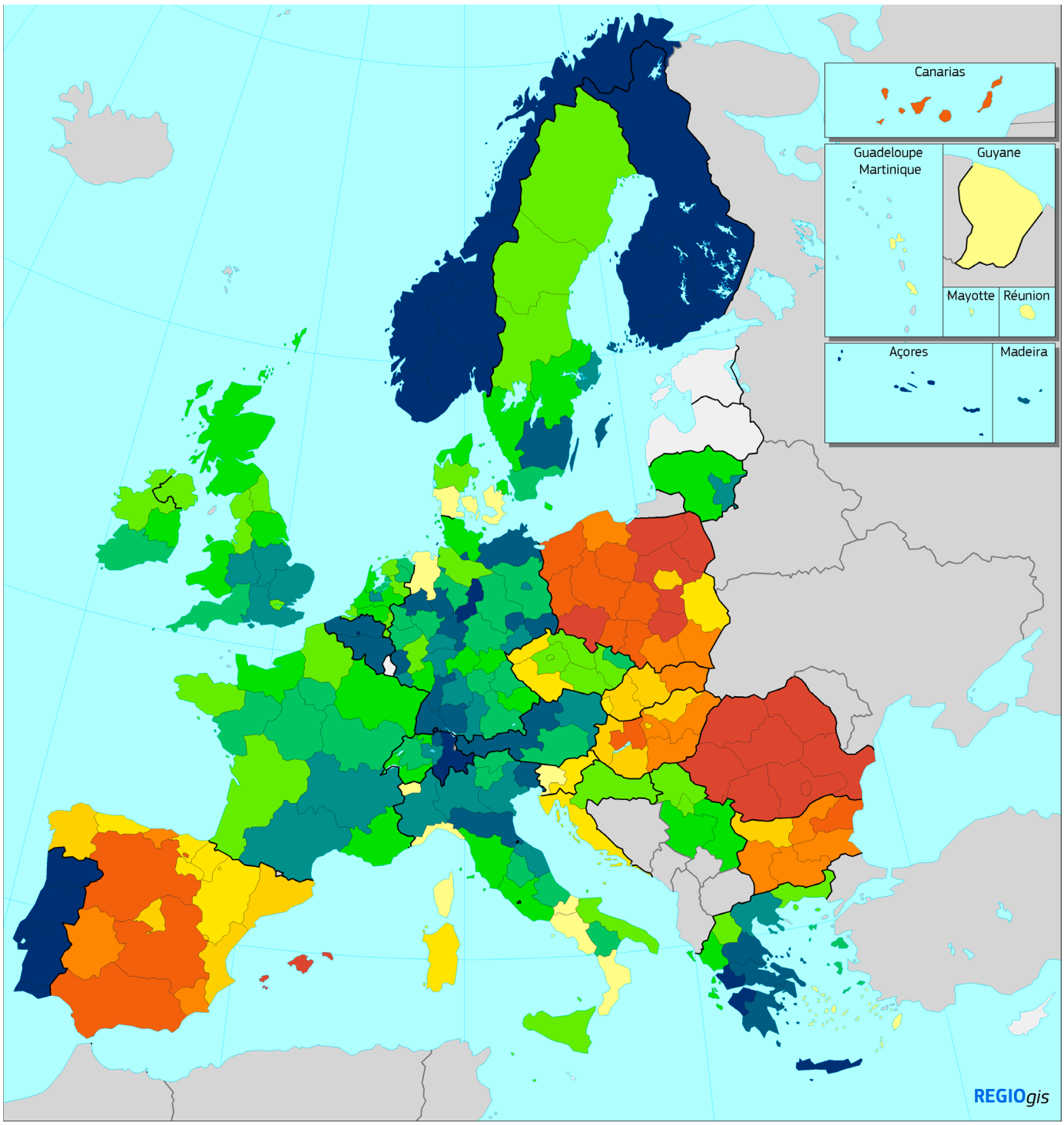
Missing data: all seven Swiss regions.

Top 40 regions

*Most recent performance 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*

	Region	
1	Wales (UKL)	202.1
2	Sostinės regionas (LT01)	201.4
3	Jadranska Hrvatska (HR03)	195.8
4	Pest (HU12)	192.7
5	Anatoliki Makedonia, Thraki (EL51)	190.8
6	Kriti (EL43)	190.0
7	Ionia Nisia (EL62)	189.8
8	Nord-Norge (NO07)	187.5
9	Východné Slovensko (SK04)	186.3
10	Severozápad (CZ04)	183.7
11	Braunschweig (DE91)	182.4
12	Kontinentalna Hrvatska (HR04)	177.9
13	Észak-Magyarország (HU31)	175.6
14	Vidurio ir vakarų Lietuvos regionas (LT02)	175.5
15	Rheinhessen-Pfalz (DEB3)	172.6
16	Norte (PT11)	167.8
17	Sachsen-Anhalt (DEE0)	167.4
18	Berlin (DE30)	165.6
19	Thüringen (DEG0)	163.8
20	Southern and Eastern Serbia (RS22)	162.1
21	Centro (PT16)	160.6
22	Åland (FI20)	159.9
23	Leipzig (DED5)	159.3
24	Dytiki Makedonia (EL53)	159.2
25	Dresden (DED2)	157.0
26	Moravskoslezsko (CZ08)	155.4
	Šumadija and Western Serbia (RS21)	155.4
28	Basilicata (ITF5)	155.2
29	Friuli-Venezia Giulia (ITH4)	154.3
30	Trier (DEB2)	153.0
31	Kentriki Makedonia (EL52)	150.7
32	Brandenburg (DE40)	150.5
33	Centre - Val de Loire (FRB)	150.1
34	Freiburg (DE13)	148.9
35	Alentejo (PT18)	148.6
36	Chemnitz (DED4)	147.8
	Småland med öarna (SE21)	147.8
38	Sør-Østlandet (NO03)	146.7
39	Peloponnisos (EL65)	146.6
40	Schwaben (DE27)	144.3

SMEs introducing product or process innovations as percentage of SMEs



SMEs introducing product or process innovations as percentage of SMEs

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

SMEs introducing product or process innovations as percentage of SMEs

In most countries, there is little variation in regional performance in the share of SMEs that introduced a product or process innovation. Norway, Portugal and Sweden perform very well compared to other European countries, given the fact that all regions in these countries are top one-third high performers. Another example of a high performing country is Belgium, whose regions - *Région de Bruxelles-Capitale* (BE1), *Vlaams Gewest* (BE2), *Région Wallonne* (BE3) – are either middle or top one-third high performers. Many countries – Austria, France, Lithuania, the Netherlands, Sweden, Switzerland and the United Kingdom, show a mix of strong and high performing regions, whereas others – Germany, Greece and Italy – have a few outlying top one-third moderate performing region together with strong and high performing regions.

The top 40 best performing regions are shown on the right. All Norwegian and five out of six Portuguese regions comprise the top 20. The first-ranked region - *Hedmark og Oppland* (NO02) in Norway – scores 81.8 percent above the EU average, as opposed to *Åland* (FI20) in Finland, which is ranked 40th and scores 34.4 percent above the EU average.

Definition of the indicator

Numerator: Number of SMEs that introduced a new product or a new process to one of their markets.

Denominator: Total number of SMEs.

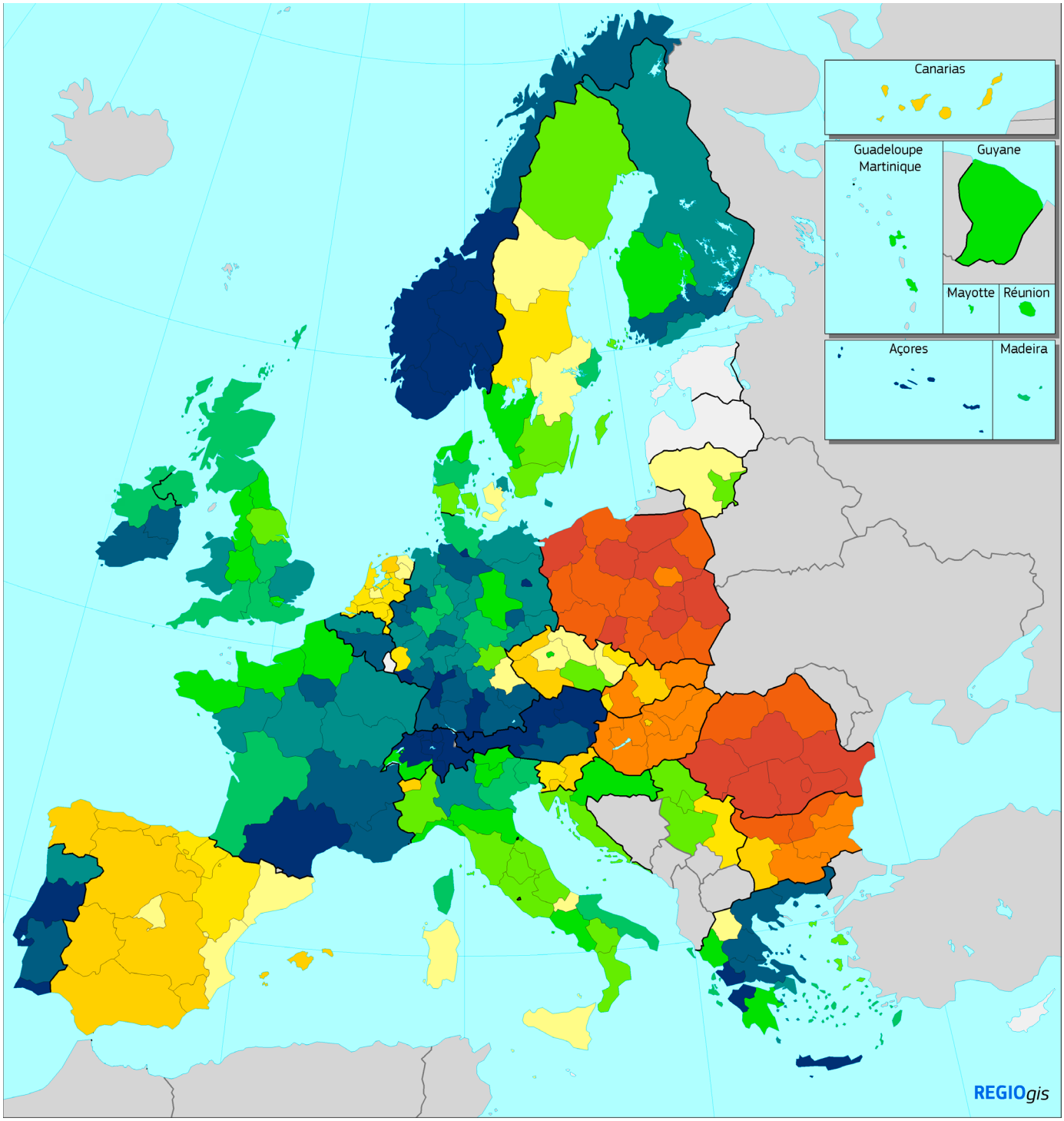
Rationale: Technological innovation as measured by the introduction of new products (goods or services) and processes is key to innovation in manufacturing activities. Higher shares of technological innovators should reflect a higher level of innovation activities.

Top 40 regions

*Most recent performance 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*

	Region	
1	Hedmark og Oppland (NO02)	181.8
2	Ticino (CH07)	178.7
3	Algarve (PT15)	176.7
4	Lisboa (PT17)	173.3
5	Centro (PT16)	172.3
6	Oslo og Akershus (NO01)	170.3
7	Etelä-Suomi (FI1C)	168.0
8	Agder og Rogaland (NO04)	165.3
9	Alentejo (PT18)	163.4
10	Trøndelag (NO06)	162.5
11	Região Autónoma dos Açores (PT20)	161.5
12	Helsinki-Uusimaa (FI1B)	161.2
13	Ostschweiz (CH05)	157.5
	Sør-Østlandet (NO03)	157.5
15	Norte (PT11)	156.8
16	Braunschweig (DE91)	155.2
17	Kriti (EL43)	153.8
18	Vestlandet (NO05)	153.2
19	Nord-Norge (NO07)	153.0
20	Pohjois- ja Itä-Suomi (FI1D)	148.8
21	Région de Bruxelles-Capitale (BE1)	148.7
22	Länsi-Suomi (FI19)	148.6
23	Dytiki Ellada (EL63)	145.8
24	Região Autónoma da Madeira (PT30)	145.2
25	Tübingen (DE14)	142.9
26	Zürich (CH04)	142.1
27	Westösterreich (AT3)	141.6
28	Trier (DEB2)	140.0
29	Leipzig (DED5)	139.1
30	Emilia-Romagna (ITH5)	138.8
31	Münster (DEA3)	138.6
	Peloponnisos (EL65)	138.6
33	Vlaams Gewest (BE2)	138.1
34	Hamburg (DE60)	137.3
35	Karlsruhe (DE12)	136.5
36	Detmold (DEA4)	135.6
37	Mecklenburg-Vorpommern (DE80)	134.8
	Région Wallonne (BE3)	134.8
39	Freiburg (DE13)	134.5
40	Åland (FI20)	134.4

SMEs introducing marketing or organisational innovations as percentage of SMEs



SMEs introducing marketing or organisational innovations as percentage of SMEs

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

SMEs introducing marketing or organisational innovations as percentage of SMEs

In most countries, there is little variation in regional performance in the share of SMEs that introduced a marketing or organizational innovation. Therefore, there are not that many differences observed within most countries. Regions with a strong or high performance are mostly found in Austria, Belgium, Croatia, Finland, France, Germany, Greece, Ireland, Italy, Norway, Portugal and Switzerland. Regions that predominantly belong to the moderate and low performing group can be found in Bulgaria, Czechia, Hungary, the Netherlands, Poland, Romania, Slovakia, Slovenia and Spain. Performance in Sweden is rather diverse, with *West Sweden* (SE0A) and *Stockholm* (SE01) belonging to middle one-third strong performers, and *North Middle Sweden* (SE06) to the middle one-third moderate performers.

The top 40 best performing regions are shown on the right. Norway and Switzerland dominate the top 10, as five out of seven Swiss regions and four out of seven Norwegians regions comprise the top-10. A large percentage gap is observed between the first rank - *Ticino* (CH07) – and the second rank - *Espace Mittelland* (CH02) -, as the former is double the EU average, and the latter is more than 80% above the EU average.

Definition of the indicator

Numerator: Number of SMEs that introduced a new marketing innovation and/or organizational innovation to one of their markets.

Denominator: Total number of SMEs.

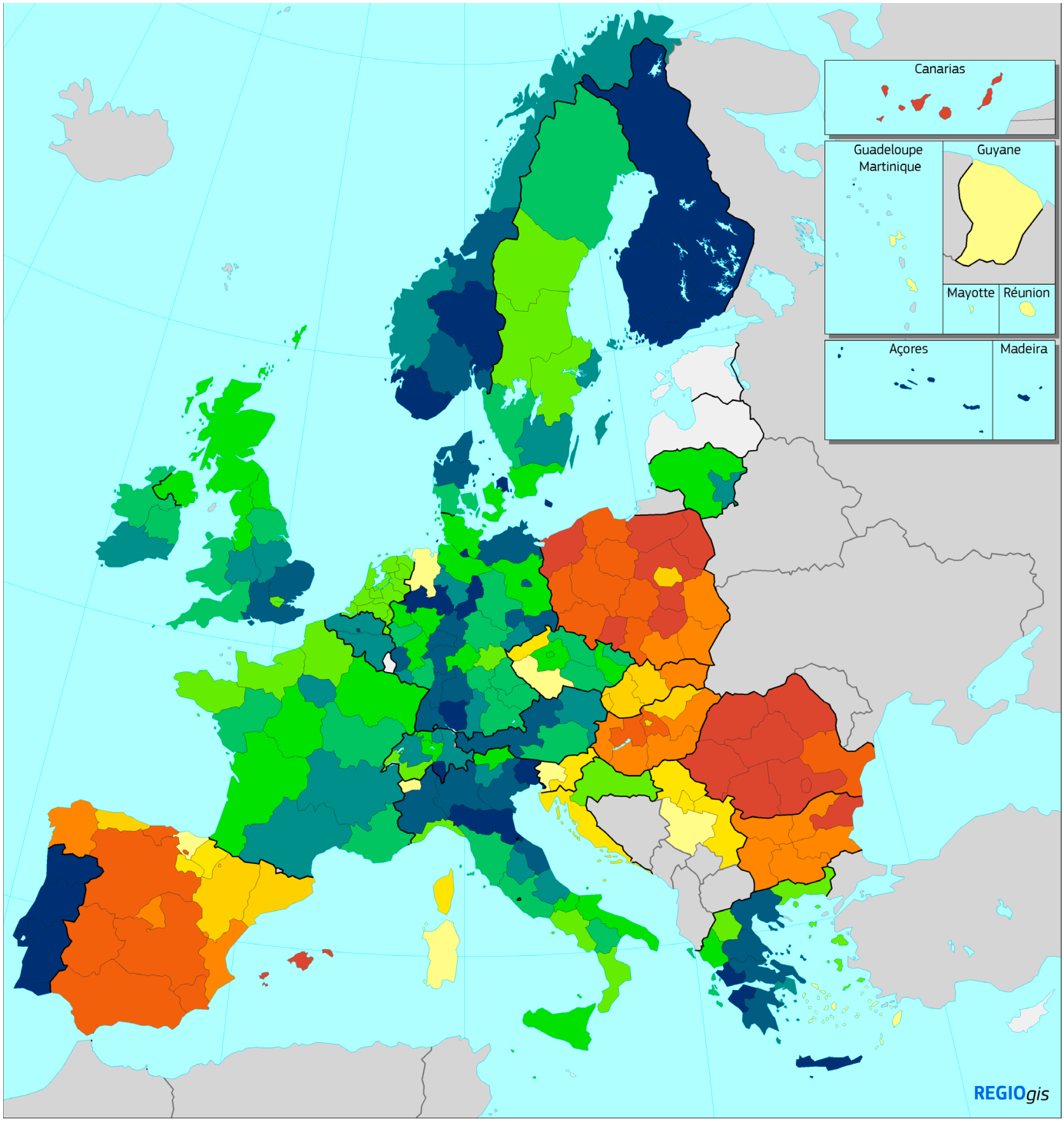
Rationale: Many firms, in particular in the service sectors, innovate through non-technological forms of innovation. Examples of these are organizational innovations. This indicator tries to capture the extent to which SMEs innovate through non-technological innovation.

Top 40 regions

*Most recent performance 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*

	Region	
1	Ticino (CH07)	207.5
2	Espace Mittelland (CH02)	184.8
3	Ostschweiz (CH05)	180.2
4	Zürich (CH04)	179.5
5	Hedmark og Oppland (NO02)	167.4
6	Trøndelag (NO06)	167.0
7	Oslo og Akershus (NO01)	162.5
8	Agder og Rogaland (NO04)	158.0
9	Zentralschweiz (CH06)	155.7
10	Algarve (PT15)	154.8
11	Schwaben (DE27)	153.8
12	Hamburg (DE60)	152.3
13	Lisboa (PT17)	150.2
14	Região Autónoma dos Açores (PT20)	149.6
15	Berlin (DE30)	149.4
16	Kriti (EL43)	147.0
17	Ostösterreich (AT1)	144.7
18	Languedoc-Roussillon - Midi-Pyrénées (FRJ)	144.3
19	Sør-Østlandet (NO03)	144.2
20	Dytiki Ellada (EL63)	143.9
21	Nordwestschweiz (CH03)	143.7
	Saarland (DEC0)	143.7
	Vestlandet (NO05)	143.7
24	Karlsruhe (DE12)	143.3
25	Centro (PT16)	143.1
	Westösterreich (AT3)	143.1
27	Southern (IE05)	142.8
28	Südösterreich (AT2)	141.3
29	Thessalia (EL61)	141.1
30	Lüneburg (DE93)	140.7
31	Eastern and Midland (IE06)	140.0
32	Anatoliki Makedonia, Thraki (EL51)	139.8
33	Freiburg (DE13)	139.5
34	Provence-Alpes-Côte d'Azur (FRL)	139.1
35	Leipzig (DED5)	138.7
36	Etelä-Suomi (FI1C)	138.6
37	Gießen (DE72)	137.7
38	Auvergne - Rhône-Alpes (FRK)	137.5
39	Kentriki Makedonia (EL52)	137.0
40	Tübingen (DE14)	136.8

SMEs innovating in-house as percentage of SMEs



SMEs innovating in-house as percentage of SMEs

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

SMEs innovating in-house as percentage of SMEs

Regional performance on SMEs innovating in-house is less spread within countries but more across countries. Strong and high performing regions are mostly located in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Lithuania, the Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom. Moderate and low performing regions are located mostly in Bulgaria, Croatia, Hungary, Poland, Romania, Slovakia, Spain, and the United Kingdom. Large differences in regional performance within countries observed in Germany and Czechia.

The top 40 best performing regions are shown on the right. Portuguese regions are well represented with six regions in the top 10. Other countries with a good representation in the top 40 include Finland, Germany and Italy. *Ticino* (CH07) is the overall best performing region.

Definition of the indicator

Numerator: Number of SMEs with in-house innovation activities. Innovative firms with in-house innovation activities have introduced a new product or new process either in-house or in combination with other firms. The indicator does not include new products or processes developed by other firms.

Denominator: Total number of SMEs

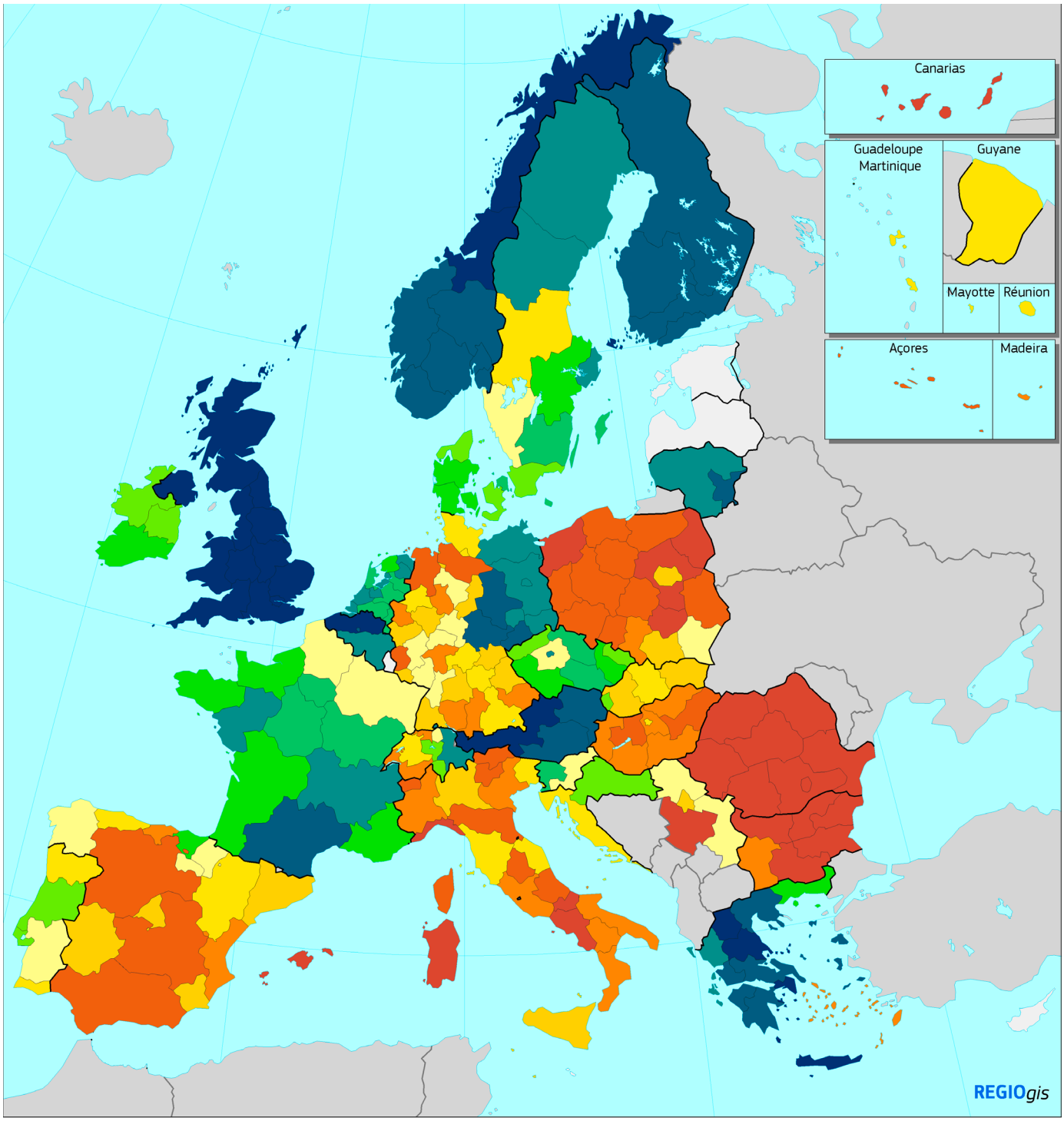
Rationale: This indicator measures the degree to which SMEs that have introduced any new or significantly improved products or production processes have innovated in-house. The indicator is limited to SMEs, because almost all large firms innovate

Top 40 regions

*Most recent performance 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*

	Region	
1	Ticino (CH07)	202.4
2	Algarve (PT15)	190.7
3	Centro (PT16)	178.3
4	Lisboa (PT17)	177.3
5	Região Autónoma dos Açores (PT20)	170.9
6	Alentejo (PT18)	170.6
7	Etelä-Suomi (FI1C)	170.1
8	Braunschweig (DE91)	168.3
9	Kriti (EL43)	162.5
10	Norte (PT11)	162.4
11	Helsinki-Uusimaa (FI1B)	160.2
12	Pohjois- ja Itä-Suomi (FI1D)	156.1
13	Emilia-Romagna (ITH5)	153.6
14	Hedmark og Oppland (NO02)	152.3
15	Tübingen (DE14)	150.7
16	Länsi-Suomi (FI19)	148.9
17	Münster (DEA3)	147.8
18	Dytiki Ellada (EL63)	146.5
19	Région de Bruxelles-Capitale (BE1)	146.0
20	Região Autónoma da Madeira (PT30)	145.6
21	Oslo og Akershus (NO01)	145.2
22	Hovedstaden (DK01)	144.2
23	Friuli-Venezia Giulia (ITH4)	143.8
24	Detmold (DEA4)	143.1
25	Hamburg (DE60)	142.7
26	Agder og Rogaland (NO04)	142.4
27	Sterea Ellada (EL64)	142.3
28	Kassel (DE73)	141.5
29	Nordjylland (DK05)	140.8
30	Midtjylland (DK04)	139.8
	Piemonte (ITC1)	139.8
32	Lombardia (ITC4)	139.0
33	Westösterreich (AT3)	137.7
34	Leipzig (DED5)	137.4
35	Marche (ITI3)	137.2
36	Berlin (DE30)	136.8
37	Gießen (DE72)	136.4
38	Karlsruhe (DE12)	136.3
39	Veneto (ITH3)	136.1
40	South East (UKJ)	136.0

Innovative SMEs collaborating with others as percentage of SMEs



Innovative SMEs collaborating with others as percentage of SMEs

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

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 from the United Kingdom stand out in performance on this indicator with all 12 regions in the top 20 best performers. Other strong and high performing regions are located in Austria, Belgium, Finland, Greece, Lithuania and Norway. Moderate and low performing regions are located mostly in Bulgaria, Hungary, Italy, Poland, Romania, Slovakia and Spain. Large differences in regional performance within countries are observed in France, Sweden and Germany, with the latter regions in the North-East performing better compared to regions in the West.

The top 40 best performing regions are shown on the right. The list is dominated by regions in Greece, Norway and the United Kingdom. *South East* (UKJ) ranks first, followed by two more regions from the United Kingdom.

Definition of the indicator

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. This 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.

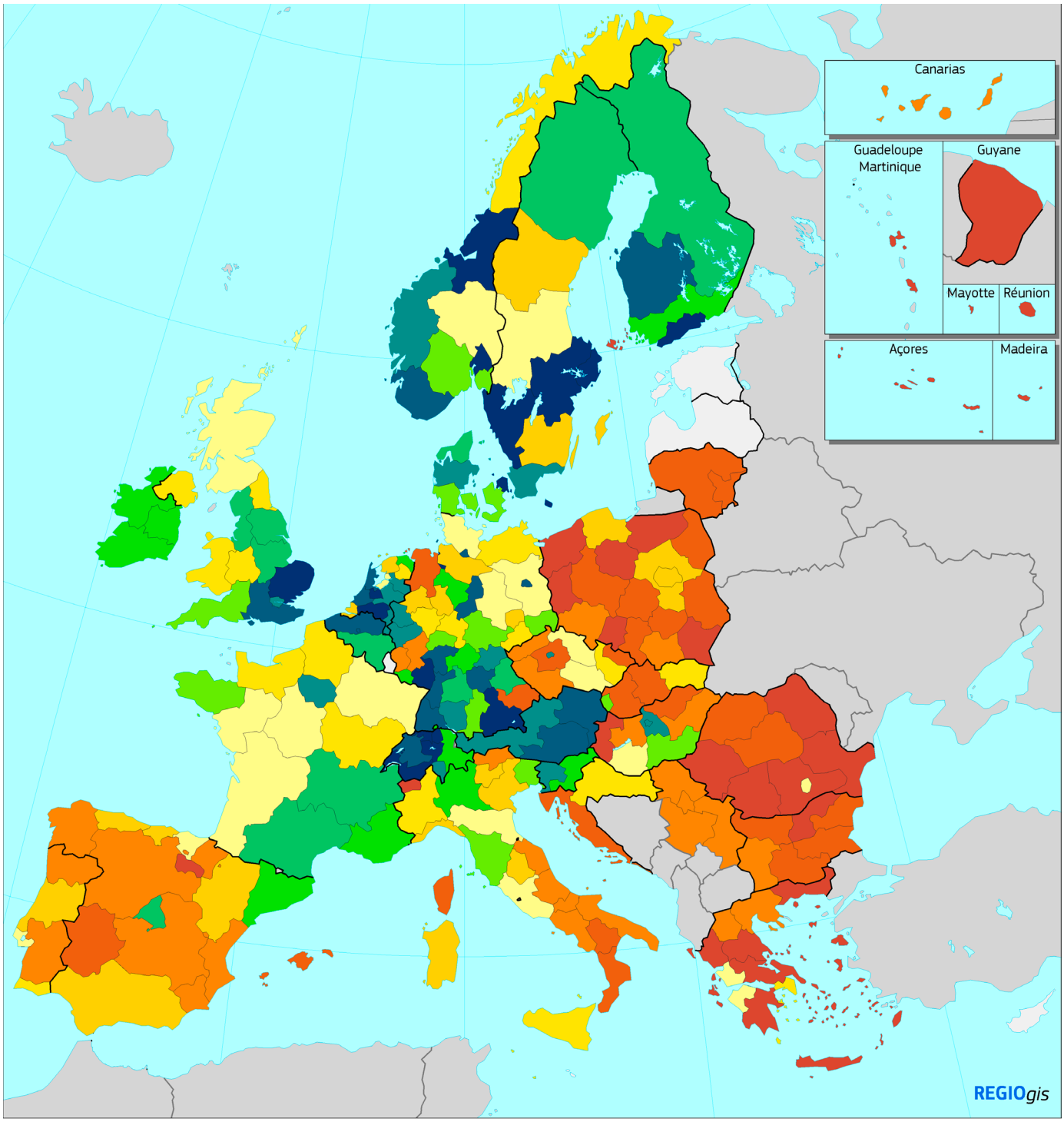
Top 40 regions

*Most recent performance 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*

	Region	
1	South East (UKJ)	248.5*
	West Midlands (UKG)	248.5*
	East of England (UKH)	248.5*
	Kriti (EL43)	248.5*
	South West (UKK)	248.5*
	Scotland (UKM)	248.5*
	Yorkshire and The Humber (UKE)	248.5*
	Trøndelag (NO06)	248.5*
9	East Midlands (UKF)	243.6
10	Wales (UKL)	240.5
11	North East (UKC)	234.7
12	North West (UKD)	233.3
13	Thessalia (EL61)	229.1
14	London (UKI)	221.4
15	Westösterreich (AT3)	212.7
16	Åland (FI20)	208.2
17	Dytiki Makedonia (EL53)	205.0
18	Nord-Norge (NO07)	204.5
19	Vlaams Gewest (BE2)	204.4
20	Northern Ireland (UKN)	203.7
21	Attiki (EL30)	201.0
22	Helsinki-Uusimaa (FI1B)	200.0
23	Dytiki Ellada (EL63)	199.1
24	Agder og Rogaland (NO04)	196.8
25	Kentriki Makedonia (EL52)	195.8
26	Vestlandet (NO05)	191.2
27	Région de Bruxelles-Capitale (BE1)	185.8
28	Peloponnisos (EL65)	179.7
29	Etelä-Suomi (FI1C)	179.3
30	Südösterreich (AT2)	176.6
31	Voreio Aigaio (EL41)	174.2
32	Pohjois- ja Itä-Suomi (FI1D)	173.0
33	Länsi-Suomi (FI19)	172.9
34	Sør-Østlandet (NO03)	171.9
35	Ostösterreich (AT1)	169.3
36	Sostinės regionas (LT01)	168.8
37	Oslo og Akershus (NO01)	163.0
38	Hedmark og Oppland (NO02)	162.3
39	Chemnitz (DED4)	154.4
40	Thüringen (DEG0)	151.9

* Regions ordered based on their scores before removing statistical outliers.

Public-private co-publications per million population



Public-private co-publications per million population

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

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 also score well on this indicator. This also explains the widely spread performance within countries. In total 148 regions belong to either the low or moderate performing group. There are just a few High and Strong performing countries in which variety is not wide spread such as Austria, Belgium and Switzerland. Comparatively, regions in Western and Northern Europe perform better on this indicator than regions in Eastern and Southern Europe. With a few exceptions such as *Zahodna Slovenija* (SI04), *Budapest* (HU11), *Pest* (HU12), *Praha* (CZ01) and *Comunidad de Madrid* (ES30).

The top 40 best performing regions are shown on the right. The top-40 is dominated by regions in Switzerland, of which six out of seven regions are represented in the top 40, and Germany with 11 out of 38 regions. *Nordwestschweiz* (CH03)) is the overall best performing region, followed by *Hovedstaden* (DK01) and *Västsverige* (SE23).

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. Publications are assigned to the country/countries in which the business companies or other private sector organisations are located.

Denominator: Total population

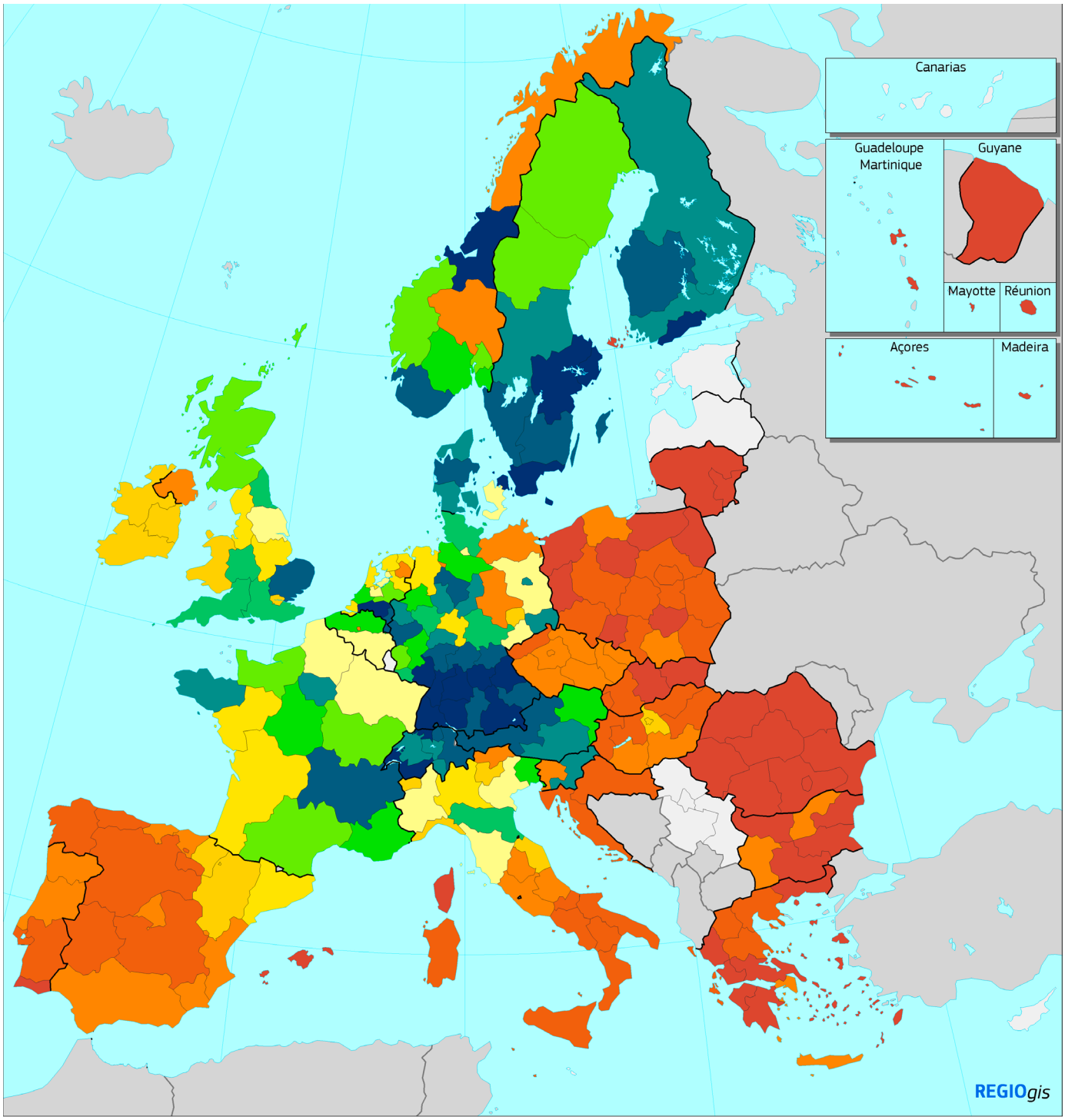
Rationale: This indicator captures public-private research linkages and active collaboration activities between business sector researchers and public sector researchers resulting in academic publications.

Top 40 regions

*Most recent performance 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*

	Region	
1	Nordwestschweiz (CH03)	244.9
	Hovedstaden (DK01)	244.9
	Västsverige (SE23)	244.9
4	Zürich (CH04)	242.0
5	Région lémanique (CH01)	240.7
6	Utrecht (NL31)	231.7
7	East of England (UKH)	212.5
8	Stockholm (SE11)	205.1
9	Rheinhessen-Pfalz (DEB3)	205.0
10	Zentralschweiz (CH06)	201.4
11	Trøndelag (NO06)	197.4
12	Oberbayern (DE21)	193.6
13	Noord-Brabant (NL41)	191.1
14	Helsinki-Uusimaa (FI1B)	188.7
15	Bremen (DE50)	181.0
16	Oslo og Akershus (NO01)	180.1
17	Östra Mellansverige (SE12)	178.9
18	Darmstadt (DE71)	170.8
19	Zuid-Holland (NL33)	170.5
20	Berlin (DE30)	169.4
21	Mittelfranken (DE25)	165.2
22	Freiburg (DE13)	157.5
23	South East (UKJ)	156.2
24	Hamburg (DE60)	154.7
25	Braunschweig (DE91)	154.6
26	Südösterreich (AT2)	151.9
27	Karlsruhe (DE12)	151.8
28	Vlaams Gewest (BE2)	148.6
29	Noord-Holland (NL32)	147.4
30	Région de Bruxelles-Capitale (BE1)	146.6
31	Länsi-Suomi (FI19)	145.8
32	Agder og Rogaland (NO04)	142.9
	Ostösterreich (AT1)	142.9
34	Espace Mittelland (CH02)	142.7
35	Sydsverige (SE22)	139.6
36	Île de France (FR1)	139.5
37	Vestlandet (NO05)	139.0
38	Ticino (CH07)	137.9
39	London (UKI)	136.8
40	Köln (DEA2)	134.3

PCT patent applications per billion regional GDP



PCT patent applications per billion regional GDP

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

PCT patent applications per billion regional GDP

There are strong geographical performance differences in PCT patent applications. Regions in Denmark, Finland, Germany, the Netherlands and Sweden are amongst the top one-third high performing group. Most of the Eastern European regions, and regions in Portugal, Spain, and the South of Italy perform relatively weak on PCT patent applications. In total 95 regions belong to the low performing group.

Performance is spread in the Netherlands, with *Noord-Brabant* (NL41), ranking first overall as a top one-third high performing region, and *Overijssel* (NL21), as the lowest performing region in the Netherlands belonging to the top one-third low performing group. Performance is also spread in France, Germany, Italy and Norway, which all have regions in the High performing group as well as in the Low performing group.

The top 40 best performing regions are shown on the right. The top 40 is dominated by regions in Germany, for which 18 out of 38 regions are represented. Sweden and Switzerland are both also well represented with five regions each.

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. This indicator measures the number of patent applications at the European Patent Office.

Missing data: Ciudad Autónoma de Ceuta (ES63), Ciudad Autónoma de Melilla (ES64), Canarias (ES70), Belgrade (RS11), Vojvodina (RS12), Šumadija and Western Serbia (RS21), and Southern and Eastern Serbia (RS22).

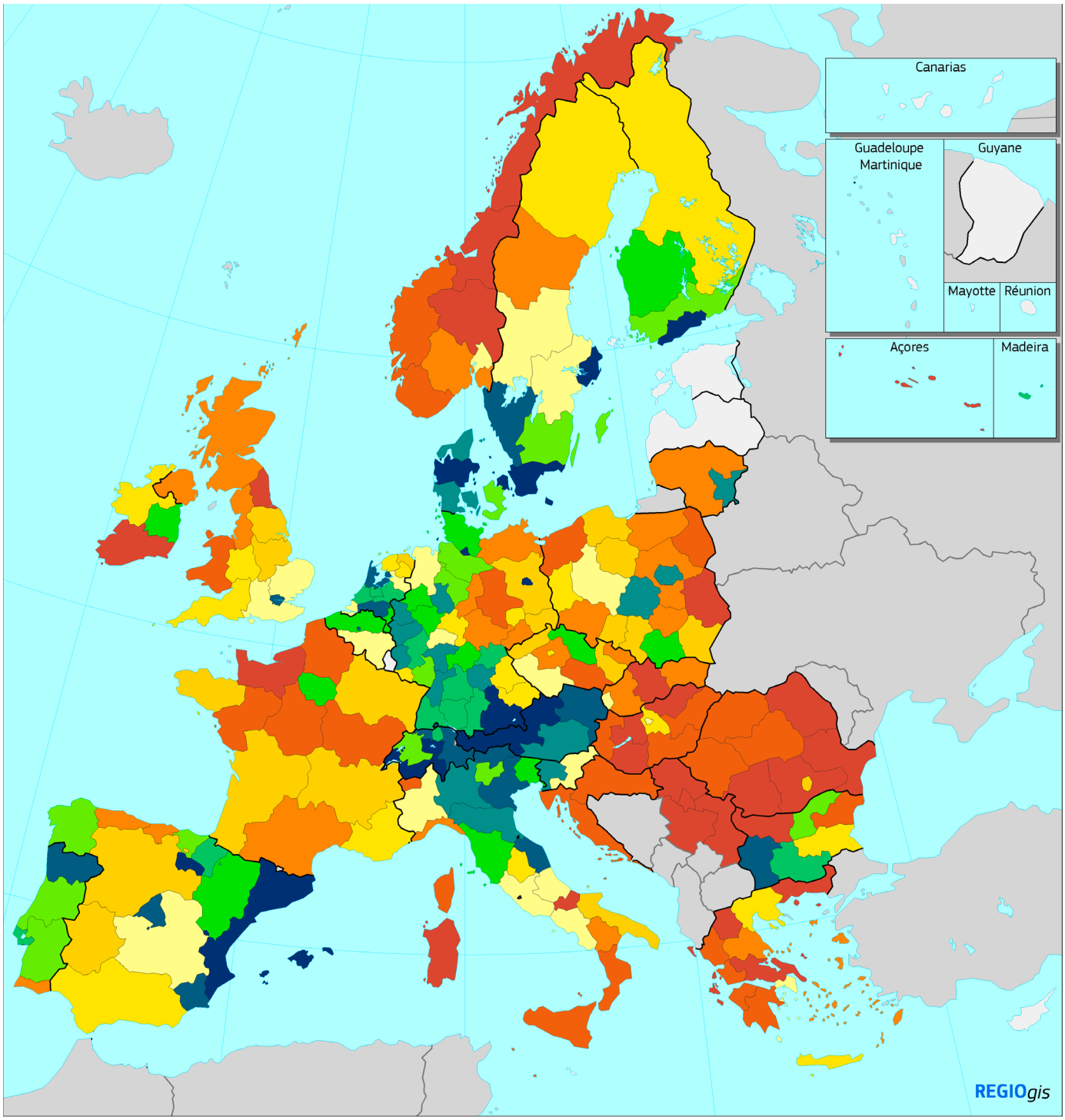
Top 40 regions

*Most recent performance 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*

	Region	
1	Noord-Brabant (NL41)	234.1*
	Oberpfalz (DE23)	234.1*
	Sydsverige (SE22)	234.1*
4	Stockholm (SE11)	213.9
5	Stuttgart (DE11)	212.3
6	Mittelfranken (DE25)	211.5
7	Helsinki-Uusimaa (FI1B)	205.2
8	Oberbayern (DE21)	192.1
9	Östra Mellansverige (SE12)	182.1
10	Nordwestschweiz (CH03)	179.3
11	Karlsruhe (DE12)	178.6
12	Rheinhessen-Pfalz (DEB3)	176.2
13	Tübingen (DE14)	176.0
14	Région lémanique (CH01)	174.8
15	Trøndelag (NO06)	174.6
16	Hovedstaden (DK01)	170.1
17	Freiburg (DE13)	169.2
18	Limburg (NL42)	168.4
19	Unterfranken (DE26)	167.6
20	Länsi-Suomi (FI19)	164.7
	Oberfranken (DE24)	164.7
22	Auvergne - Rhône-Alpes (FRK)	161.7
23	Västsverige (SE23)	156.8
24	Zürich (CH04)	148.6
25	Darmstadt (DE71)	147.1
26	Midtjylland (DK04)	146.7
27	Westösterreich (AT3)	146.5
28	Schwaben (DE27)	146.4
29	East of England (UKH)	142.9
30	Småland med öarna (SE21)	140.2
31	Agder og Rogaland (NO04)	136.8
32	Hannover (DE92)	133.0
33	Köln (DEA2)	132.0
	Niederbayern (DE22)	132.0
35	Ostschweiz (CH05)	131.9
36	Nordjylland (DK05)	131.5
37	Düsseldorf (DEA1)	130.9
38	Braunschweig (DE91)	130.6
	Gießen (DE72)	130.6
40	Zentralschweiz (CH06)	130.0

* Regions ordered based on their scores before removing statistical outliers.

Trademark applications per billion regional GDP



Trademark applications per billion regional GDP

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

Trademark applications per billion regional GDP

Performance on trademark applications is widely spread across Europe and within countries. Performance is relatively strong in Austria, Denmark and Switzerland. Other countries with high performing regions include, Belgium, Bulgaria, Finland, Germany, Italy, Lithuania, the Netherlands Poland, Portugal, Slovenia, Spain, Sweden and the United Kingdom.

Regional differences in Spain are rather high, with the best performing region, *La Rioja* (ES23), being the overall third-best leading region, and the lowest performing region, *Principado de Asturias* (ES12), being part of the top one-third low performers. Large differences in regional performance groups within one country are also observed in Bulgaria, Germany, Italy, Poland, Portugal, Sweden and the United Kingdom. Performance is also higher in capital regions compared to other regions in most countries.

The top 40 best performing regions are shown on the right. In total 16 countries are represented in the top 40 with some notable Eastern European regions such as *Yugozapaden* (BG41), *Sostinės regionas* (LT01) and *Warszawski stoleczny* (PL91). *Zentralschweiz* (CH06) and *Ticino* (CH07) are the two best performing regions.

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 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.

Missing data: Canarias (ES70), RUP FR - Régions ultrapériphériques françaises (FRY), and Aland (FI20).

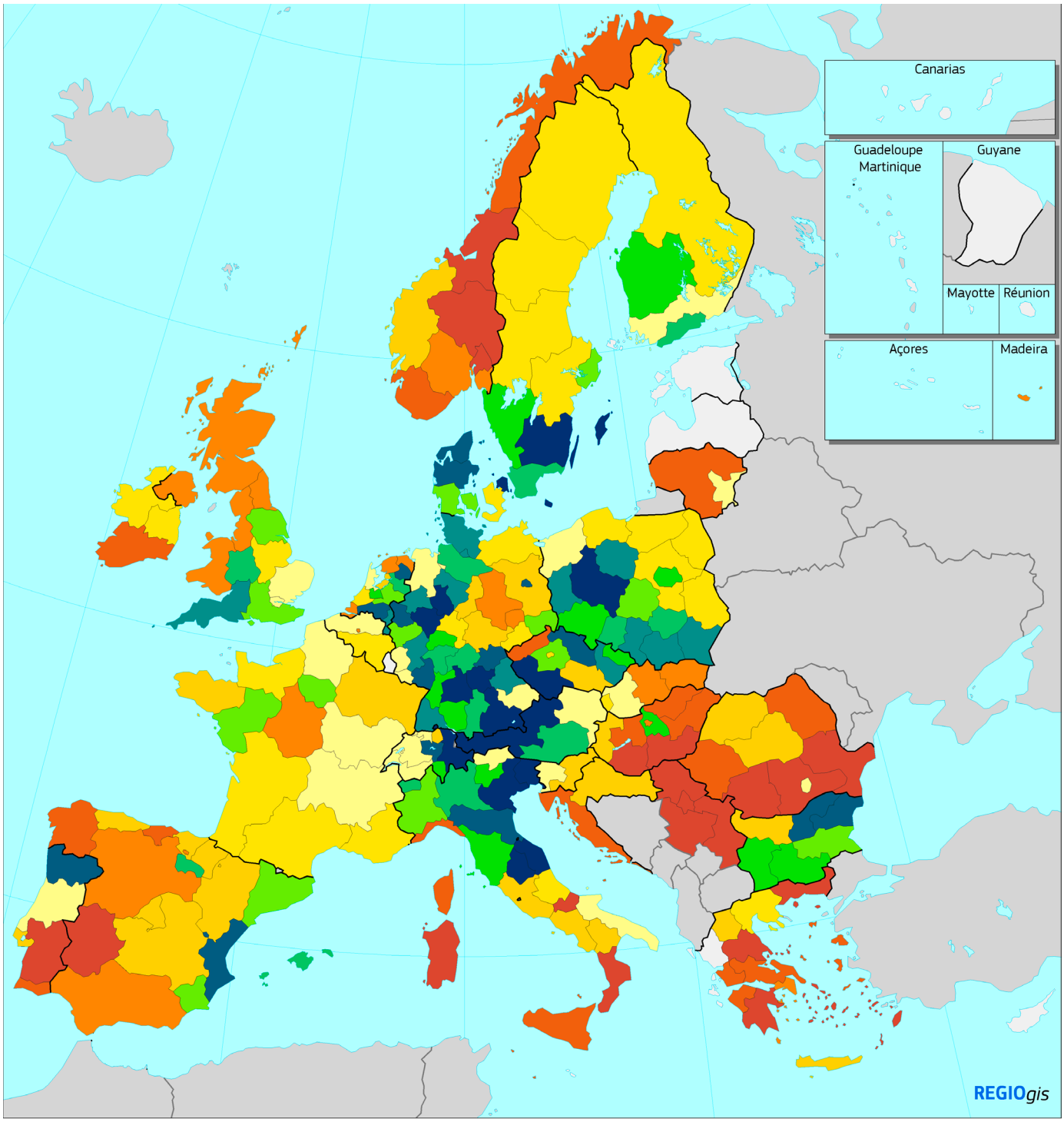
Top 40 regions

*Most recent performance 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*

	Region	
1	Zentralschweiz (CH06)	225.7*
	Ticino (CH07)	225.7*
	La Rioja (ES23)	225.7*
4	Helsinki-Uusimaa (FI1B)	224.8
5	Stockholm (SE11)	215.3
6	Berlin (DE30)	208.1
7	Illes Balears (ES53)	198.3
8	Hovedstaden (DK01)	197.2
9	Comunidad Valenciana (ES52)	193.1
10	Sydsverige (SE22)	186.5
11	Cataluña (ES51)	178.8
12	Hamburg (DE60)	174.3
13	Oberbayern (DE21)	173.9
14	Midtjylland (DK04)	172.9
15	Westösterreich (AT3)	168.1
16	Région lémanique (CH01)	167.9
17	Región de Murcia (ES62)	166.0
18	Ostösterreich (AT1)	163.3
19	Norte (PT11)	157.7
20	Västsverige (SE23)	155.9
21	Veneto (ITH3)	151.8
22	Noord-Holland (NL32)	151.3
23	Nordwestschweiz (CH03)	147.5
24	Flevoland (NL23)	144.1
25	Provincia Autonoma Bolzano/Bozen (ITH1)	143.6
26	Noord-Brabant (NL41)	142.9
27	Yugozapaden (BG41)	141.2
28	London (UKI)	141.1
29	Ostschweiz (CH05)	139.7
30	Comunidad de Madrid (ES30)	139.2
31	Région de Bruxelles-Capitale (BE1)	134.2
32	Marche (ITI3)	132.5
33	Lombardia (ITC4)	131.9
34	Sostinės regionas (LT01)	131.3
35	SI04 - Zahodna Slovenija (SI04)	130.6
36	Warszawski stoleczny (PL91)	130.0
37	Emilia-Romagna (ITH5)	129.4
38	Südösterreich (AT2)	129.1
39	Syddanmark (DK03)	128.8
40	Düsseldorf (DEA1)	126.2

* Regions ordered based on their scores before removing statistical outliers.

Design applications per billion regional GDP



Design applications per billion regional GDP

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

Design applications per billion regional GDP

Performance on design applications is widely spread across Europe and within countries. Most regions belong to the low and moderate performance groups, 147 in total. High performing regions are found mostly in Austria, Czechia, Denmark, Germany, Italy, the Netherlands and Poland. All countries except Denmark have low and moderate performing regions. Croatia, Greece, Lithuania, Norway, Romania and Slovakia have high shares of low performing regions. Large differences within countries are observed in Germany, Italy, the Netherlands, 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. In total 13 countries are represented in the top 40. Germany is well represented in the top 40 with 13 regions as well as Italy with five, Poland with four and Czechia with three regions. *Umbria* (ITI2) is the best performing region, followed by *Jihozápad* (CZ03) and *Ostschweiz* (CH05).

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. 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.

Missing data: Ipeiros (EL54), Ionia Nisia (EL62), Canarias (ES70), RUP FR - Régions ultrapériphériques françaises (FRY), Região Autónoma dos Açores (PT20), and Aland (FI20).

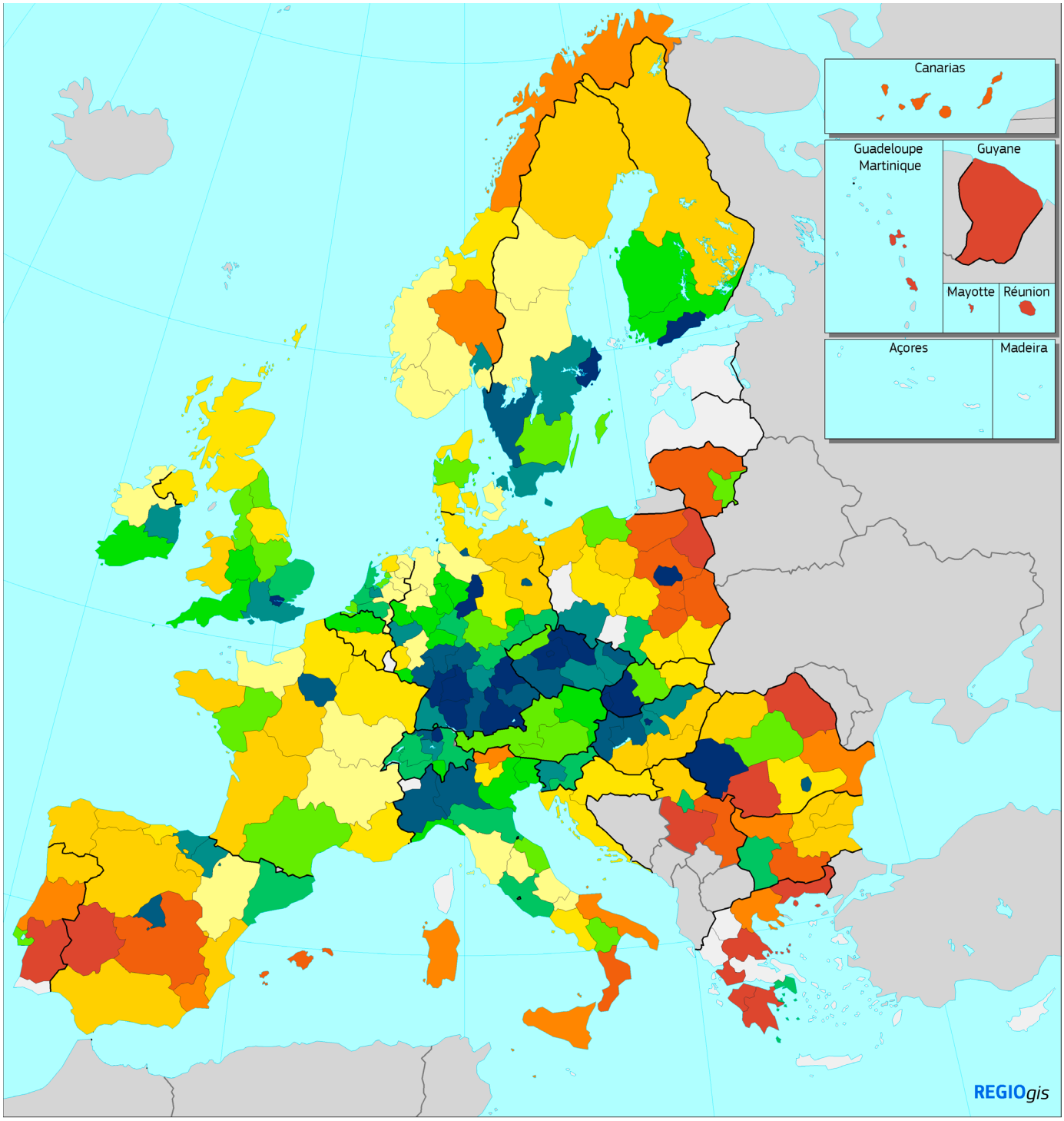
Top 40 regions

*Most recent performance 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*

	Region	
1	Umbria (ITI2)	204.1*
	Jihozápad (CZ03)	204.1*
	Ostschweiz (CH05)	204.1*
4	Arnsberg (DEA5)	193.5
5	Detmold (DEA4)	193.4
6	Marche (ITI3)	183.4
7	Stuttgart (DE11)	175.5
8	Veneto (ITH3)	175.2
9	Mittelfranken (DE25)	168.5
10	Westösterreich (AT3)	163.6
11	Wielkopolskie (PL41)	162.5
12	Friuli-Venezia Giulia (ITH4)	161.6
13	Oberbayern (DE21)	157.4
14	Hovedstaden (DK01)	151.5
15	Småland med öarna (SE21)	151.1
16	Emilia-Romagna (ITH5)	148.3
17	Midtjylland (DK04)	147.6
18	Oberfranken (DE24)	147.1
19	Noord-Brabant (NL41)	146.2
20	Severoiztochen (BG33)	145.8
21	Comunidad Valenciana (ES52)	143.5
22	Drenthe (NL13)	141.6
23	Severovýchod (CZ05)	140.5
24	Berlin (DE30)	136.8
25	Norte (PT11)	135.8
26	Rheinhessen-Pfalz (DEB3)	132.3
27	Nordjylland (DK05)	132.0
28	Zentralschweiz (CH06)	131.2
29	Düsseldorf (DEA1)	131.0
30	Severen tsentralen (BG32)	130.7
31	Hamburg (DE60)	130.6
32	Lubuskie (PL43)	130.5
33	Malopolskie (PL21)	129.6
34	Schleswig-Holstein (DEF)	128.3
35	Kujawsko-Pomorskie (PL61)	127.7
36	Oberpfalz (DE23)	127.4
37	Koblenz (DEB1)	127.2
38	Hannover (DE92)	126.3
39	South West (UKK)	125.8
40	Střední Morava (CZ07)	123.6

* Regions ordered based on their scores before removing statistical outliers.

Employment in medium-high/high tech manufacturing and knowledge-intensive services as percentage of total workforce



Employment in medium-high/high-tech manufacturing and knowledge-intensive services as percentage of total workforce

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

Employment in medium-high/high tech manufacturing and knowledge-intensive services as percentage of total workforce

Employment in medium-high and high-tech manufacturing and knowledge-intensive services is high in 55 regions in Europe and 33 regions belong to the low performing group. There are 17 countries with at least one region that is part of the high performers group. High shares of high performing regions are mostly observed in Czechia, Germany, Hungary, Italy, Switzerland and Sweden. Large differences within countries are observed in Italy, Norway, Poland, Spain and Romania 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), *Vest* (RO42) and *Stockholm* (SE11) are the three best performing regions. In total 15 countries are represented in the top 40. Germany is well represented in the top 40 with 13 regions as well as Czechia with six regions. Eastern European regions are also represented in the top 40 such as, *Vest* (RO42) and *Bucuresti - Ilfov* (RO32), *Bratislavský kraj* (SK01) and *Západné Slovensko* (SK02).

Definition of the indicator

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

Denominator: Total workforce including all manufacturing and service sectors

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

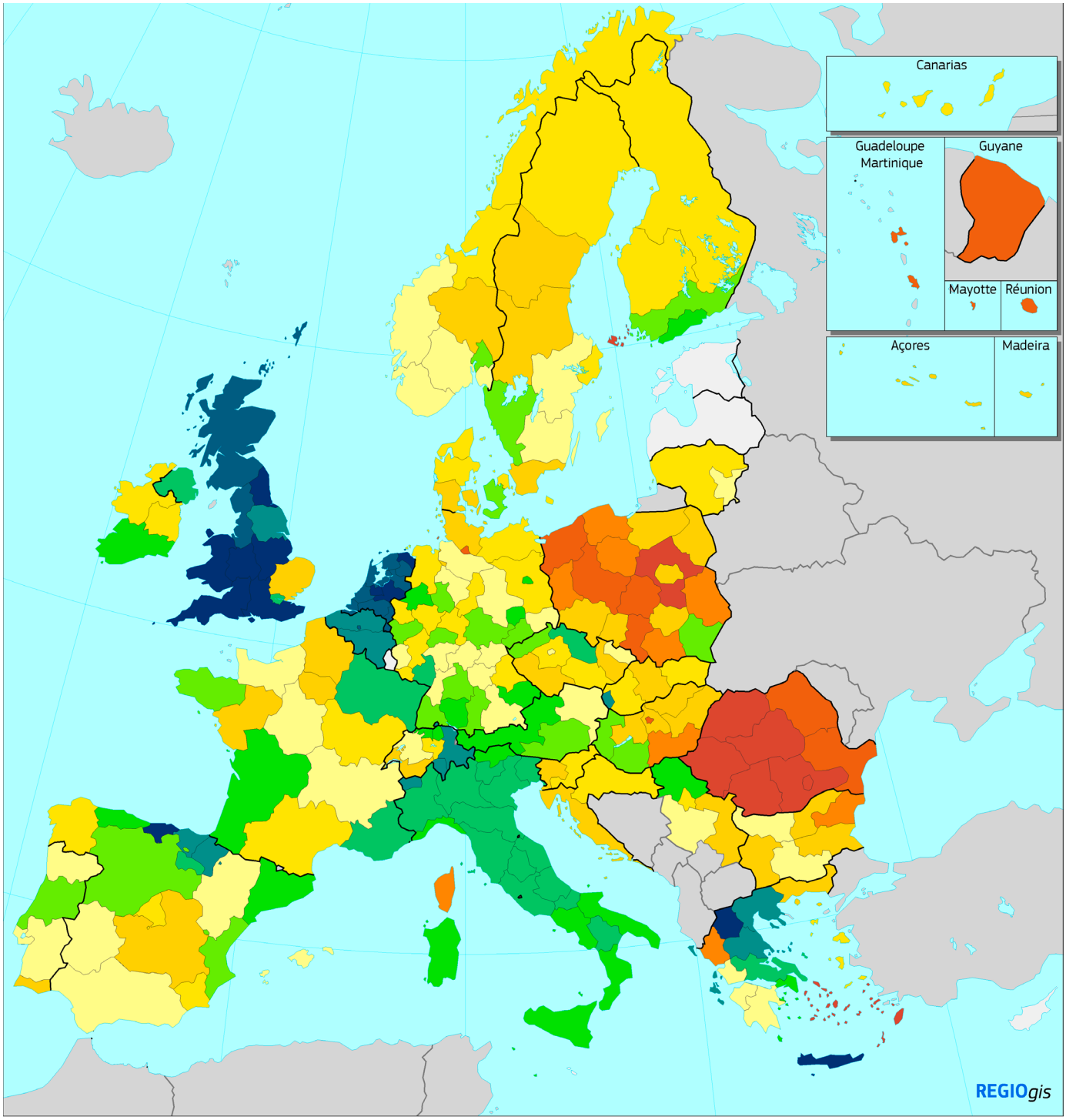
Missing data: Dytiki Makedonia (EL53), Ipeiros (EL54), Ionia Nisia (EL62), Sterea Ellada (EL64), Voreio Aigaio (EL41), Notio Aigaio (EL42), Kriti (EL43), Ciudad Autónoma de Ceuta (ES63), Ciudad Autónoma de Melilla (ES64), Corse (FRM), Valle d'Aosta/Vallée d'Aoste (IT@C2), Lubuskie (PL43), Opolskie (PL52), Algarve (PT15), Região Autónoma dos Açores (PT20), Região Autónoma da Madeira (PT30), Åland (FI20).

Top 40 regions

*Most recent performance 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*

	Region	
1	Stuttgart (DE11)	199.5
2	Vest (RO42)	187.3
3	Stockholm (SE11)	186.4
4	Bratislavský kraj (SK01)	182.4
5	Oberbayern (DE21)	179.9
6	Tübingen (DE14)	166.1
7	Braunschweig (DE91)	162.8
8	Helsinki-Uusimaa (FI1B)	161.2
9	Karlsruhe (DE12)	160.4
	Praha (CZ01)	160.4
11	London (UKI)	156.3
12	Budapest (HU11)	155.5
	Warszawski stoleczny (PL91)	155.5
14	Střední Cechy (CZ02)	153.8
15	Severovýchod (CZ05)	153.0
16	Západné Slovensko (SK02)	151.4
	Zürich (CH04)	151.4
18	Oberpfalz (DE23)	149.7
19	Közép-Dunántúl (HU21)	148.9
20	Hamburg (DE60)	148.1
21	Lombardia (ITC4)	147.3
	Nyugat-Dunántúl (HU22)	147.3
23	Darmstadt (DE71)	144.0
	Schwaben (DE27)	144.0
25	Comunidad de Madrid (ES3)	143.2
26	Rheinhessen-Pfalz (DEB3)	142.4
27	Bucuresti - Ilfov (RO32)	140.8
	Niederbayern (DE22)	140.8
	Nordwestschweiz (CH03)	140.8
30	Västsverige (SE23)	140.0
31	Jihozápad (CZ03)	139.1
32	Berlin (DE30)	138.3
	Île de France (FR1)	138.3
	Unterfranken (DE26)	138.3
35	Moravskoslezsko (CZ08)	135.9
36	Piemonte (ITC1)	135.1
37	Zahodna Slovenija (SI04)	134.3
38	Eastern and Midland (IE06)	131.8
39	Dolnoslaskie (PL51)	131.0
40	Jihovýchod (CZ06)	130.2

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



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

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

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

Performance is less spread within countries but more across countries. High shares of high performing regions are observed in Belgium and the United Kingdom. There is very little variance in performance amongst Italian regions with regions belonging to either the middle one-third strong performers or top one-third strong performers. Performance is widely spread in Greece with *Kriti* (EL43) being the overall top performing region on this indicator and *Notio Aigaio* (EL42) belonging to the bottom one-third low performers. In total, 110 regions perform at a moderate level, and just 24 regions belong to the high performing group.

The top 40 best performing regions are shown on the right. All the regions in Belgium are included in the top 40. Italy is also well represented with 12 regions, the United Kingdom with 10 regions, and Greece with five regions.

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 firm products).

Top 40 regions

*Most recent performance 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*

	Region	
1	East Midlands (UKF)	166.0*
	Wales (UKL)	166.0*
	South West (UKK)	166.0*
	South East (UKJ)	166.0*
	West Midlands (UKG)	166.0*
	North East (UKC)	166.0*
	Kriti (EL43)	166.0*
8	Dytiki Makedonia (EL53)	162.6
9	Cantabria (ES13)	161.4
10	Scotland (UKM)	160.3
11	Région de Bruxelles-Capitale (BE1)	159.6
12	North West (UKD)	155.0
13	Ostschweiz (CH05)	151.5
14	País Vasco (ES21)	138.4
15	Vlaams Gewest (BE2)	130.6
16	Thessalia (EL61)	129.9
	Yorkshire and The Humber (UKE)	129.9
18	Comunidad Foral de Navarra (ES22)	129.0
19	Valle d'Aosta/Vallée d'Aoste (ITC2)	128.1
20	Bratislavský kraj (SK01)	128.0
21	Ionia Nisia (EL62)	127.6
22	Région Wallonne (BE3)	127.5
23	Ticino (CH07)	127.4
24	Kentriki Makedonia (EL52)	126.3
25	London (UKI)	119.9
26	Piemonte (ITC1)	118.8
27	Abruzzo (ITF1)	114.9
28	Marche (ITI3)	114.7
29	Basilicata (ITF5)	114.3
30	Toscana (ITI1)	113.9
31	Molise (ITF2)	113.6
32	Veneto (ITH3)	113.3
33	Lombardia (ITC4)	113.2
34	Emilia-Romagna (ITH5)	112.9
35	Friuli-Venezia Giulia (ITH4)	112.7
36	La Rioja (ES23)	112.6
37	Utrecht (NL31)	111.4
38	Rheinhessen-Pfalz (DEB3)	110.8
39	Lazio (ITI4)	110.2
40	Alsace - Champagne-Ardenne - Lorraine (FRF)	108.8

* Regions ordered based on their scores before removing statistical outliers.

5. RIS methodology

5.1 Missing data: imputations

For 238 regions and 17 indicators, full data availability would require data for 4,046 data cells for the most recent year. For the most recent year, 9.1% of the data are not available. For the full five years including data for five waves of the CIS, full data availability would require data for 20,230 data cells. For several indicators, regional data are missing for several years or even for the entire period considered. To increase data availability, a regionalisation technique has been used in previous versions of the RIS for the indicators using CIS data, followed by a set of imputation techniques for the remaining missing CIS data and the indicators not using CIS data. With regional CIS 2016 data having made available by almost all countries, the regionalisation technique has not been used for the CIS 2016.

5.1.1 CIS regionalisation technique

Whenever CIS data are missing for all regions, while the national-level aggregate for the country is available, a CIS "regionalisation" technique has been applied using country and regional-level data on employment and number of firms at the two-digit industry level, assuming that industry intensities at the country level also hold at the regional level. We explain the method for regionalising the CIS data by using the share of firms with product and process innovations as an example:

- Step 1: Calculate for each country Y the share of firms with product and process innovations for each industry I using the CIS 2016 country level data: PI_Y_I
- Step 2: Identify the employment share of industry I for region R: EMPL_R_I
- Step 3: Calculate the estimate for the share of firms with product and process innovations by multiplying EMPL_R_I with PI_Y_I: PI_EMPL_R_I
- Step 4: Identify the share of local units (enterprises) of industry I for region R: ENTR_R_I
- Step 5: Calculate the estimate for the share of firms with product and process innovations by multiplying ENTR_R_I with PI_Y_I: PI_ENTR_R_I
- Step 6: Calculate the average of PI_EMPL_R_I and PI_ENTR_R_I as the estimate for the regional share of product and process innovators: PI_R_I

5.1.2 General imputation techniques

The following techniques will be 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, 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: Lifelong learning, International scientific co-publications, R&D expenditures in the public sector, R&D expenditures in the business sector, Non-R&D innovation expenditures, Public-private co-publications, PCT patent applications, Design applications, and Sales of new-to-market and new-to-firm innovations.

Following this transformation, the data are normalised using the min-max procedure. The minimum score observed for all regions across all five observations 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 five observations. 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 17 indicators.

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

1. Calculate the ratios of the EIS 2019 Summary Innovation Index at country level with that of the EU: EIS_index_CTR / EIS_index_EU;

2. Calculate the ratios of the RIS 2019 Regional Innovation Index at country level with that of the EU: RIS_index_CTR / RIS_index_EU;

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

These country correction factors are then multiplied with the RII for each region in the corresponding country to obtain final RII scores. Relative performance scores are calculated by dividing the RII of the region by that of the EU and multiplying by 100. For trend performance, RIIs for all years are divided by that of the EU in 2011.

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 more than 20% above the EU average in 2019; Strong Innovators are all regions with a relative performance between 90% and 120% of the EU average in 20197; Moderate Innovators are all regions with a relative performance between 50% and 90% of the EU average in 2019; Modest Innovators are all regions with a relative performance below 50% of the EU average in 2019.

Annex 1: RIS indicators

Percentage population aged 30-34 having completed tertiary education	
Numerator	Number of persons in age class with some form of post-secondary education
Denominator	Total population between 30 and 34 years
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	No, proxy for EIS indicator measuring share of population aged 25-34 having completed tertiary education
Data source	Eurostat, regional statistics
Data availability	NUTS 2: 2009, 2011, 2013, 2015, 2017

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: 2009, 2011, 2013, 2015, 2017

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: Web of Science. Data provided by CWTS (Leiden University) as part of a contract to DG Research and Innovation. Denominator: Eurostat
Data availability	NUTS 2: 2008, 2010, 2012, 2014, 2016

Scientific publications among the top-10% most cited publications worldwide as percentage of total scientific publications of the region	
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	Web of Science. Data provided by CWTS (Leiden University) as part of a contract to DG Research and Innovation
Data availability	NUTS 2: 2007, 2009, 2011, 2013, 2015

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: 2008, 2010, 2012, 2014, 2016

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: 2008, 2010, 2012, 2014, 2016

Non-R&D innovation expenditures in SMEs as percentage of turnover	
Numerator	Sum of total innovation expenditure for SMEs, excluding intramural and extramural R&D expenditures
Denominator	Total turnover for SMEs
Rationale	This indicator measures non-R&D innovation expenditure as percentage of total turnover. Several of the components of innovation expenditure, such as investment in equipment and machinery and the acquisition of patents and licenses, measure the diffusion of new production technology and ideas.
Included in EIS	No, proxy for EIS indicator including all enterprises
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2008, CIS 2010, CIS 2012, CIS 2014, CIS 2016

SMEs introducing product or process innovations as percentage of SMEs	
Numerator	Number of SMEs that introduced a new product or a new process to one of their markets
Denominator	Total number of SMEs
Rationale	Technological innovation as measured by the introduction of new products (goods or services) and processes is key to innovation in manufacturing activities. Higher shares of technological innovators should 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 2008, CIS 2010, CIS 2012, CIS 2014, CIS 2016

SMEs introducing marketing or organisational innovations as percentage of SMEs	
Numerator	Number of SMEs that introduced a new marketing innovation and/or organisational innovation to one of their markets
Denominator	Total number of SMEs
Rationale	Many firms, in particular in the service sectors, innovate through non-technological forms of innovation. Examples of these are organisational innovations. This indicator tries to capture the extent to which SMEs innovate through non-technological innovation.
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 2008, CIS 2010, CIS 2012, CIS 2014, CIS 2016

SMEs innovating in-house as percentage of SMEs	
Numerator	Number of SMEs with in-house innovation activities. Innovative firms with in-house innovation activities have introduced a new product or new process either in-house or in combination with other firms. The indicator does not include new products or processes developed by other firms.
Denominator	Total number of SMEs
Rationale	This indicator measures the degree to which SMEs that have introduced any new or significantly improved products or production processes have innovated in-house. The indicator is limited to SMEs, because almost all large firms innovate.
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 2008, CIS 2010, CIS 2012, CIS 2014, CIS 2016

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 2008, CIS 2010, CIS 2012, CIS 2014, CIS 2016

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: Web of Science. Data provided by CWTS (Leiden University) as part of a contract to DG Research and Innovation Denominator: Eurostat
Data availability	NUTS 2: 2009, 2011, 2013, 2015, 2017

EPO 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: 2008, 2010, 2012, 2014, 2016

Trademark applications per billion regional GDP	
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 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	No, proxy for EIS indicator covering both EUIPO and WIPO (Madrid Protocol) 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: 2009, 2011, 2013, 2015, 2017

Design applications per billion regional GDP	
Numerator	Number of designs applied for at EUIPO
Denominator	Gross Domestic Product in Purchasing Power Standard
Rationale	A design is the outward appearance of a product or part of it resulting from the lines, contours, colours, shape, texture, materials and/or its ornamentation. A product can be any industrial or handicraft item including packaging, graphic symbols and typographic typefaces but excluding computer programs. It also includes products that are composed of multiple components, which may be disassembled and reassembled. Community design protection is directly enforceable in each Member State and it provides both the option of an unregistered and a registered Community design right for one area encompassing all Member States.
Included in EIS	No, proxy for EIS indicator covering individual design applications
Data source	Numerator: European Union Intellectual Property Office (EUIPO). Data provided by Science Metrix as part of a contract to DG Research and Innovation. Denominator: Eurostat
Data availability	NUTS 2: 2009, 2011, 2013, 2015, 2017

Employment in medium-high/high tech manufacturing and knowledge-intensive services as percentage of total workforce	
Numerator	Number of employed persons in the medium-high and high tech manufacturing sectors include Chemicals (NACE 24), Machinery (NACE 29), Office equipment (NACE 30), Electrical equipment (NACE 31), Telecommunications and related equipment (NACE 32), Precision instruments (NACE 33), Automobiles (NACE 34) and Aerospace and other transport (NACE 35). Number of employed persons in the knowledge-intensive services sectors include Water transport (NACE 61), Air transport (NACE 62), Post and telecommunications (NACE 64), Financial intermediation (NACE 65), Insurance and pension funding (NACE 66), Activities auxiliary to financial intermediation (NACE 67), Real estate activities (NACE 70), Renting of machinery and equipment (NACE 71), Computer and related activities (NACE 72), Research and development (NACE73), and Other business activities (NACE 74).
Denominator	Total workforce including all manufacturing and service sectors
Rationale	The share of employment in high technology manufacturing sectors is an indicator of the manufacturing economy that is based on continual innovation through creative, inventive activity. The use of total employment gives a better indicator than using the share of manufacturing employment alone, since the latter will be affected by the relative decline of manufacturing in some countries. Knowledge-intensive services can be provided directly to consumers, such as telecommunications, and provide inputs to the innovative activities of other firms in all sectors of the economy. The latter can increase productivity throughout the economy and support the diffusion of a range of innovations, in particular those based on ICT.
Included in EIS	No, proxy for EIS indicator on employment in knowledge-intensive activities
Data source	Eurostat
Data availability	NUTS 2: 2009, 2011, 2013, 2015, 2017

Sales of new-to-market and new-to-firm innovations in SMEs as percentage of turnover	
Numerator	Sum of total turnover of new or significantly improved products for SMEs
Denominator	Total turnover for SMEs
Rationale	This indicator measures the turnover of new or significantly improved products and includes both products which are only new to the firm and products which are also new to the market. The indicator thus captures both the creation of state-of-the-art technologies (new to market products) and the diffusion of these technologies (new to firm products).
Included in EIS	No, proxy for EIS indicator including all enterprises
Data source	Community Innovation Survey: Eurostat and National Statistical Offices
Data availability	NUTS 1 and 2 for different countries for CIS 2008, CIS 2010, CIS 2012, CIS 2014, CIS 2016

Annex 2: Regional innovation performance groups

		"2011" - score relative to EU 2011	"2019" - score relative to EU 2011	"2019" - score relative to EU 2019	Performance group
EU28	EU28	100.0	104.7	100.0	
BE	Belgium				
BE1	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest	114.2	127.7	121.9	Leader -
BE2	Vlaams Gewest	122.9	125.1	119.4	Strong +
BE3	Région Wallonne	100.7	106.3	101.6	Strong
BG	Bulgaria				
BG31	Severozapaden	35.6	32.6	31.2	Modest -
BG32	Severen tsentralen	39.2	40.2	38.4	Modest
BG33	Severoiztochen	40.4	39.1	37.3	Modest
BG34	Yugoiztochen	38.9	37.4	35.7	Modest -
BG41	Yugozapaden	54.3	56.8	54.2	Moderate -
BG42	Yuzhen tsentralen	40.3	39.4	37.6	Modest
CZ	Czechia				
CZ01	Praha	102.6	103.6	98.9	Strong -
CZ02	Střední Čechy	86.2	79.5	75.9	Moderate
CZ03	Jihozápad	80.0	82.4	78.7	Moderate +
CZ04	Severozápad	61.0	60.1	57.4	Moderate -
CZ05	Severovýchod	90.4	88.7	84.7	Moderate +
CZ06	Jihovýchod	85.5	85.0	81.2	Moderate +
CZ07	Střední Morava	79.3	80.1	76.5	Moderate +
CZ08	Moravskoslezsko	70.1	78.7	75.2	Moderate
DK	Denmark				
DK01	Hovedstaden	164.3	158.1	151.0	Leader +
DK02	Sjælland	119.4	98.1	93.7	Strong -
DK03	Syddanmark	114.3	105.2	100.5	Strong
DK04	Midtjylland	135.5	133.3	127.3	Leader -
DK05	Nordjylland	114.3	116.9	111.6	Strong +
DE	Germany				
DE11	Stuttgart	143.1	135.6	129.5	Leader
DE12	Karlsruhe	152.3	143.3	136.9	Leader
DE13	Freiburg	140.3	129.3	123.5	Leader -
DE14	Tübingen	148.3	139.1	132.9	Leader
DE21	Oberbayern	153.6	147.1	140.4	Leader +
DE22	Niederbayern	101.2	91.5	87.4	Moderate +
DE23	Oberpfalz	128.5	110.3	105.3	Strong
DE24	Oberfranken	128.5	112.1	107.0	Strong
DE25	Mittelfranken	138.7	133.5	127.5	Leader
DE26	Unterfranken	129.5	114.2	109.1	Strong
DE27	Schwaben	117.8	108.8	103.9	Strong
DE30	Berlin	136.6	152.3	145.4	Leader +
DE40	Brandenburg	100.8	101.3	96.7	Strong -
DE50	Bremen	117.6	114.5	109.3	Strong
DE60	Hamburg	123.8	128.1	122.4	Leader -
DE71	Darmstadt	131.1	128.6	122.8	Leader -

		"2011" - score relative to EU 2011	"2019" - score relative to EU 2011	"2019" - score relative to EU 2019	Performance group
DE72	Gießen	122.7	120.6	115.1	Strong +
DE73	Kassel	100.1	95.5	91.2	Strong -
DE80	Mecklenburg-Vorpommern	94.2	97.1	92.7	Strong -
DE91	Braunschweig	127.4	137.0	130.8	Leader
DE92	Hannover	118.1	108.4	103.5	Strong
DE93	Lüneburg	98.2	89.3	85.3	Moderate +
DE94	Weser-Ems	93.8	79.5	75.9	Moderate +
DEA1	Düsseldorf	118.7	107.9	103.0	Strong
DEA2	Köln	129.1	123.0	117.4	Strong +
DEA3	Münster	113.2	107.4	102.6	Strong
DEA4	Detmold	116.4	110.8	105.8	Strong
DEA5	Arnsberg	118.1	106.0	101.2	Strong
DEB1	Koblenz	104.4	91.9	87.7	Moderate +
DEB2	Trier	99.3	102.7	98.1	Strong -
DEB3	Rheinhessen-Pfalz	140.3	132.5	126.5	Leader -
DEC0	Saarland	111.6	101.7	97.1	Strong -
DED2	Dresden	129.0	127.7	121.9	Leader -
DED4	Chemnitz	92.6	102.6	98.0	Strong -
DED5	Leipzig	105.1	117.1	111.8	Strong +
DEE0	Sachsen-Anhalt	96.8	94.4	90.2	Strong -
DEF0	Schleswig-Holstein	107.6	97.8	93.4	Strong -
DEG0	Thüringen	113.1	109.5	104.6	Strong
EE	Estonia				
IE	Ireland				
IE04	Northern and Western	104.4	108.9	104.0	Strong
IE05	Southern	113.3	116.6	111.3	Strong +
IE06	Eastern and Midland	116.3	115.7	110.5	Strong +
EL	Greece				
EL51	Anatoliki Makedonia, Thraki	45.1	59.9	57.2	Moderate -
EL52	Kentriki Makedonia	61.8	83.1	79.4	Moderate +
EL53	Dytiki Makedonia	51.2	74.3	70.9	Moderate
EL54	Ipeiros	56.5	69.0	65.9	Moderate
EL61	Thessalia	54.6	71.6	68.4	Moderate
EL62	Ionia Nisia	39.1	61.9	59.1	Moderate
EL63	Dytiki Ellada	59.5	77.3	73.8	Moderate
EL64	Sterea Ellada	53.1	63.0	60.2	Moderate
EL65	Peloponnisos	50.9	58.5	55.9	Moderate -
EL30	Attiki	67.1	86.3	82.4	Moderate +
EL41	Voreio Aigaio	39.7	58.7	56.0	Moderate -
EL42	Notio Aigaio	52.6	40.3	38.5	Modest
EL43	Kriti	68.8	98.9	94.4	Strong -
ES	Spain				
ES11	Galicia	55.8	58.3	55.7	Moderate -
ES12	Principado de Asturias	58.2	61.1	58.4	Moderate -
ES13	Cantabria	54.6	63.1	60.2	Moderate
ES21	País Vasco	74.8	83.6	79.8	Moderate +
ES22	Comunidad Foral de Navarra	76.2	79.0	75.5	Moderate
ES23	La Rioja	66.6	70.6	67.5	Moderate
ES24	Aragón	62.9	67.7	64.7	Moderate

		"2011" - score relative to EU 2011	"2019" - score relative to EU 2011	"2019" - score relative to EU 2019	Performance group
ES30	Comunidad de Madrid	73.4	77.5	74.0	Moderate
ES41	Castilla y León	57.7	54.1	51.6	Moderate -
ES42	Castilla-la Mancha	48.2	46.8	44.7	Modest +
ES43	Extremadura	46.9	45.4	43.4	Modest +
ES51	Cataluña	76.3	81.2	77.6	Moderate +
ES52	Comunidad Valenciana	65.2	72.5	69.3	Moderate
ES53	Illes Balears	49.8	54.8	52.3	Moderate -
ES61	Andalucía	51.4	53.4	51.0	Moderate -
ES62	Región de Murcia	53.1	61.8	59.0	Moderate
ES63	Ciudad Autónoma de Ceuta	25.1	27.2	26.0	Modest -
ES64	Ciudad Autónoma de Melilla	25.8	40.7	38.9	Modest
ES70	Canarias	44.6	48.2	46.1	Modest +
FR	France				
FR1	Île de France	125.3	122.0	116.5	Strong +
FRB	Centre - Val de Loire	96.8	95.4	91.1	Strong -
FRC	Bourgogne - Franche-Comté	98.7	96.9	92.5	Strong -
FRD	Normandie	90.8	89.4	85.4	Moderate +
FRE	Nord-Pas de Calais - Picardie	86.0	83.4	79.6	Moderate +
FRF	Alsace - Champagne-Ardenne - Lorraine	98.7	95.9	91.5	Strong -
FRG	Pays de la Loire	92.1	98.4	93.9	Strong -
FRH	Bretagne	98.4	100.4	95.9	Strong -
FRI	Aquitaine - Limousin - Poitou-Charentes	96.8	98.3	93.9	Strong -
FRJ	Languedoc-Roussillon - Midi-Pyrénées	119.6	118.7	113.3	Strong +
FRK	Auvergne - Rhône-Alpes	117.1	120.8	115.4	Strong +
FRL	Provence-Alpes-Côte d'Azur	104.9	107.3	102.5	Strong
FRM	Corse	47.3	56.7	54.1	Moderate -
FRY	Régions ultrapériphériques françaises	52.7	63.5	60.6	Moderate
HR	Croatia				
HR03	Jadranska Hrvatska	50.3	47.1	45.0	Modest +
HR04	Kontinentalna Hrvatska	59.5	61.2	58.5	Moderate -
IT	Italy				
ITC1	Piemonte	78.0	83.6	79.8	Moderate +
ITC2	Valle d'Aosta/Vallée d'Aoste	57.2	59.8	57.1	Moderate -
ITC3	Liguria	62.0	70.8	67.7	Moderate
ITC4	Lombardia	82.7	90.7	86.6	Moderate +
ITH1	Provincia Autonoma Bolzano/Bozen	68.2	71.2	68.0	Moderate
ITH2	Provincia Autonoma Trento	75.0	86.0	82.1	Moderate +
ITH3	Veneto	81.2	88.9	84.9	Moderate +
ITH4	Friuli-Venezia Giulia	89.3	97.0	92.6	Strong -
ITH5	Emilia-Romagna	82.2	93.3	89.1	Moderate +
ITI1	Toscana	71.8	82.8	79.1	Moderate +
ITI2	Umbria	70.9	83.3	79.5	Moderate +
ITI3	Marche	72.1	85.0	81.2	Moderate +
ITI4	Lazio	76.4	77.8	74.3	Moderate
ITF1	Abruzzo	57.7	73.1	69.8	Moderate
ITF2	Molise	47.6	60.1	57.4	Moderate -
ITF3	Campania	55.0	66.2	63.3	Moderate
ITF4	Puglia	58.7	64.1	61.2	Moderate

		"2011" - score relative to EU 2011	"2019" - score relative to EU 2011	"2019" - score relative to EU 2019	Performance group
ITF5	Basilicata	50.7	65.7	62.7	Moderate
ITF6	Calabria	46.0	53.6	51.1	Moderate -
ITG1	Sicilia	52.4	59.2	56.5	Moderate -
ITG2	Sardegna	53.2	53.5	51.1	Moderate -
CY	Cyprus				
LV	Latvia				
LT	Lithuania				
LT01	Sostinės regionas	65.0	90.5	86.4	Moderate +
LT02	Vidurio ir vakarų Lietuvos regionas	50.0	68.4	65.4	Moderate
LU	Luxembourg				
HU	Hungary				
HU11	Budapest	85.6	84.4	80.6	Moderate +
HU12	Pest	75.2	81.5	77.8	Moderate +
HU21	Közép-Dunántúl	59.7	53.4	51.0	Moderate -
HU22	Nyugat-Dunántúl	60.1	55.1	52.6	Moderate -
HU23	Dél-Dunántúl	50.5	53.3	50.9	Moderate -
HU31	Észak-Magyarország	47.6	53.1	50.7	Moderate -
HU32	Észak-Alföld	50.8	52.0	49.7	Modest +
HU33	Dél-Alföld	53.4	54.5	52.1	Moderate -
MT	Malta				
NL	Netherlands				
NL11	Groningen	107.3	118.7	113.3	Strong +
NL12	Friesland	83.9	87.7	83.8	Moderate +
NL13	Drenthe	81.6	100.4	95.8	Strong -
NL21	Overijssel	109.5	114.6	109.4	Strong
NL22	Gelderland	115.3	124.4	118.8	Strong +
NL23	Flevoland	107.5	109.7	104.8	Strong
NL31	Utrecht	126.9	141.2	134.8	Leader
NL32	Noord-Holland	119.0	128.7	123.0	Leader -
NL33	Zuid-Holland	117.0	127.2	121.5	Leader -
NL34	Zeeland	88.3	90.4	86.3	Moderate +
NL41	Noord-Brabant	128.7	135.2	129.1	Leader
NL42	Limburg	111.9	123.7	118.2	Strong +
AT	Austria				
AT1	Ostösterreich	114.2	120.2	114.8	Strong +
AT2	Südösterreich	112.5	121.7	116.2	Strong +
AT3	Westösterreich	110.5	125.5	119.9	Strong +
PL	Poland				
PL21	Malopolskie	56.7	73.4	70.1	Moderate
PL22	Slaskie	49.3	53.8	51.4	Moderate -
PL41	Wielkopolskie	51.5	55.5	53.0	Moderate -
PL42	Zachodniopomorskie	37.4	45.1	43.1	Modest
PL43	Lubuskie	42.0	42.9	41.0	Modest
PL51	Dolnoslaskie	54.9	59.7	57.0	Moderate -
PL52	Opolskie	40.7	43.2	41.2	Modest
PL61	Kujawsko-Pomorskie	45.9	48.2	46.0	Modest +
PL62	Warminsko-Mazurskie	43.3	38.7	37.0	Modest
PL63	Pomorskie	55.0	60.4	57.7	Moderate -
PL71	Lódzkie	48.6	54.9	52.4	Moderate -

		"2011" - score relative to EU 2011	"2019" - score relative to EU 2011	"2019" - score relative to EU 2019	Performance group
PL72	Swietokrzyskie	42.1	48.3	46.1	Modest +
PL81	Lubelskie	42.5	48.4	46.2	Modest +
PL82	Podkarpackie	47.0	61.0	58.3	Moderate -
PL84	Podlaskie	38.2	45.4	43.3	Modest
PL91	Warszawski stoleczny	82.2	82.4	78.7	Moderate +
PL92	Mazowiecki regionalny	49.0	49.2	47.0	Modest +
PT	Portugal				
PT11	Norte	83.3	97.1	92.7	Strong -
PT15	Algarve	74.9	77.6	74.1	Moderate
PT16	Centro	87.1	96.0	91.6	Strong -
PT17	Lisboa	93.4	99.1	94.6	Strong -
PT18	Alentejo	68.9	73.9	70.6	Moderate
PT20	Região Autónoma dos Açores	63.1	66.5	63.5	Moderate
PT30	Região Autónoma da Madeira	57.5	73.7	70.4	Moderate
RO	Romania				
RO11	Nord-Vest	40.8	31.1	29.7	Modest -
RO12	Centru	39.4	28.6	27.3	Modest -
RO21	Nord-Est	41.5	22.5	21.5	Modest -
RO22	Sud-Est	42.7	23.1	22.1	Modest -
RO31	Sud - Muntenia	36.1	19.3	18.4	Modest -
RO32	Bucuresti - Ilfov	62.0	54.1	51.6	Moderate -
RO41	Sud-Vest Oltenia	31.4	15.0	14.3	Modest -
RO42	Vest	40.0	34.3	32.8	Modest -
SI	Slovenia				
SI03	Vzhodna Slovenija	87.5	73.9	70.6	Moderate
SI04	Zahodna Slovenija	106.0	90.8	86.7	Moderate +
SK	Slovakia				
SK01	Bratislavský kraj	89.2	92.6	88.5	Moderate +
SK02	Západné Slovensko	55.8	58.6	56.0	Moderate -
SK03	Stredné Slovensko	59.6	54.5	52.0	Moderate -
SK04	Východné Slovensko	53.1	59.7	57.1	Moderate -
FI	Finland				
FI1B	Helsinki-Uusimaa	150.6	163.4	156.0	Leader +
FI1C	Etelä-Suomi	116.2	126.5	120.8	Leader -
FI19	Länsi-Suomi	127.5	130.4	124.5	Leader -
FI1D	Pohjois- ja Itä-Suomi	112.3	122.9	117.4	Strong +
FI20	Åland	81.5	80.4	76.7	Moderate +
SE	Sweden				
SE11	Stockholm	160.9	161.1	153.8	Leader +
SE12	Östra Mellansverige	145.6	138.1	131.9	Leader
SE21	Småland med öarna	114.6	116.8	111.6	Strong +
SE22	Sydsverige	155.7	143.4	137.0	Leader
SE23	Västsverige	142.5	145.4	138.8	Leader +
SE31	Norra Mellansverige	94.4	95.0	90.8	Strong -
SE32	Mellersta Norrland	100.1	93.7	89.4	Moderate +
SE33	Övre Norrland	125.2	120.0	114.6	Strong +
UK	United Kingdom				
UKC	North East	97.0	108.5	103.6	Strong
UKD	North West	105.0	110.8	105.8	Strong

		"2011" - score relative to EU 2011	"2019" - score relative to EU 2011	"2019" - score relative to EU 2019	Performance group
UKE	Yorkshire and The Humber	96.2	112.6	107.5	Strong
UKF	East Midlands	109.7	117.5	112.2	Strong +
UKG	West Midlands	98.5	121.1	115.6	Strong +
UKH	East of England	125.3	129.0	123.2	Leader -
UKI	London	116.8	127.4	121.6	Leader -
UKJ	South East	122.0	136.0	129.9	Leader
UKK	South West	114.1	124.7	119.1	Strong +
UKL	Wales	94.7	111.3	106.3	Strong
UKM	Scotland	107.5	118.3	113.0	Strong +
UKN0	Northern Ireland	80.6	96.7	92.3	Strong -
NO	Norway				
NO01	Oslo og Akershus	125.0	141.9	135.6	Leader
NO02	Hedmark og Oppland	73.4	95.5	91.2	Strong -
NO03	Sør-Østlandet	89.7	107.8	103.0	Strong
NO04	Agder og Rogaland	95.8	113.9	108.8	Strong
NO05	Vestlandet	104.3	122.8	117.3	Strong +
NO06	Trøndelag	125.1	143.2	136.8	Leader
NO07	Nord-Norge	76.8	110.9	106.0	Strong
CH	Switzerland				
CH01	Région lémanique	147.7	147.3	140.7	Leader +
CH02	Espace Mittelland	135.2	141.2	134.8	Leader
CH03	Nordwestschweiz	165.6	156.6	149.6	Leader +
CH04	Zürich	174.1	167.6	160.1	Leader +
CH05	Ostschweiz	143.1	157.3	150.2	Leader +
CH06	Zentralschweiz	156.5	152.9	146.1	Leader +
CH07	Ticino	146.7	164.2	156.8	Leader +
RS	Serbia				
RS11	Belgrade	50.8	68.7	65.6	Moderate
RS12	Vojvodina	43.5	65.2	62.2	Moderate
RS21	Šumadija and Western Serbia	40.2	51.2	48.9	Modest +
RS22	Southern and Eastern Serbia	36.6	53.0	50.6	Moderate -

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	Lifelong learning	Scientific co-publications	Most-cited publications	R&D expenditure public sector	R&D expenditure business sector	Non-R&D innovation expenditures	Product or process innovators	Marketing or organisational innovators
EU28	EU28									
BE	Belgium									
BE1	Région de Bruxelles-Capitale	0.720	0.363	1.000	0.527	0.612	0.518	0.508	0.732	0.637
BE2	Vlaams Gewest	0.576	0.245	0.769	0.648	0.621	0.724	0.499	0.680	0.586
BE3	Région Wallonne	0.478	0.185	0.523	0.506	0.520	0.728	0.443	0.664	0.623
BG	Bulgaria									
BG31	Severozapaden	0.083	0.018	0.049	0.220	0.156	0.299	0.476	0.249	0.150
BG32	Severen tsentralen	0.373	0.036	0.086	0.188	0.057	0.299	0.367	0.220	0.161
BG33	Severoiztochen	0.364	0.024	0.152	0.153	0.244	0.276	0.602	0.165	0.162
BG34	Yugoiztochen	0.151	0.036	0.114	0.259	0.113	0.213	0.502	0.237	0.170
BG41	Yugozapaden	0.544	0.103	0.435	0.173	0.378	0.454	0.316	0.246	0.241
BG42	Yuzhen tsentralen	0.151	0.024	0.151	0.177	0.143	0.307	0.505	0.220	0.169
CZ	Czechia									
CZ01	Praha	0.817	0.324	1.000	0.297	0.827	0.495	0.314	0.495	0.524
CZ02	Střední Čechy	0.271	0.224	0.259	0.457	0.446	0.646	0.569	0.494	0.406
CZ03	Jihozápad	0.214	0.294	0.461	0.418	0.410	0.481	0.517	0.354	0.303
CZ04	Severozápad	0.099	0.188	0.145	0.368	0.097	0.224	0.909	0.356	0.325
CZ05	Severovýchod	0.300	0.282	0.302	0.198	0.305	0.509	0.673	0.498	0.397
CZ06	Jihovýchod	0.393	0.294	0.539	0.337	0.642	0.623	0.414	0.498	0.425
CZ07	Střední Morava	0.269	0.285	0.444	0.357	0.397	0.460	0.405	0.488	0.394
CZ08	Moravskoslezsko	0.332	0.321	0.297	0.184	0.335	0.454	0.769	0.543	0.373
DK	Denmark									
DK01	Hovedstaden	0.862	0.908	1.000	0.667	0.869	0.985	0.314	0.516	0.590
DK02	Sjælland	0.323	0.714	0.556	0.628	0.542	0.348	0.330	0.413	0.380
DK03	Syddanmark	0.402	0.733	0.676	0.559	0.552	0.546	0.282	0.403	0.427
DK04	Midtjylland	0.618	0.772	0.853	0.616	0.730	0.635	0.513	0.494	0.540
DK05	Nordjylland	0.515	0.705	0.766	0.577	0.734	0.416	0.250	0.513	0.505
DE	Germany									
DE11	Stuttgart	0.447	0.266	0.389	0.575	0.458	1.000	0.599	0.640	0.618
DE12	Karlsruhe	0.449	0.272	0.881	0.624	0.907	0.897	0.641	0.672	0.671
DE13	Freiburg	0.368	0.257	0.639	0.542	0.703	0.668	0.737	0.662	0.653
DE14	Tübingen	0.420	0.269	0.760	0.536	0.688	0.997	0.699	0.704	0.640
DE21	Oberbayern	0.610	0.239	0.792	0.657	0.726	0.959	0.455	0.561	0.622
DE22	Niederbayern	0.298	0.142	0.196	0.320	0.225	0.542	0.565	0.516	0.621
DE23	Oberpfalz	0.305	0.194	0.491	0.512	0.469	0.640	0.390	0.552	0.394
DE24	Oberfranken	0.305	0.233	0.472	0.593	0.496	0.601	0.476	0.524	0.438
DE25	Mittelfranken	0.420	0.203	0.623	0.592	0.684	0.877	0.547	0.550	0.611
DE26	Unterfranken	0.373	0.242	0.595	0.566	0.547	0.626	0.407	0.503	0.610
DE27	Schwaben	0.293	0.176	0.266	0.340	0.253	0.608	0.714	0.602	0.720
DE30	Berlin	0.594	0.309	0.822	0.569	1.000	0.619	0.819	0.651	0.699
DE40	Brandenburg	0.119	0.182	0.611	0.685	0.734	0.380	0.745	0.562	0.576
DE50	Bremen	0.390	0.279	0.844	0.455	0.962	0.510	0.461	0.600	0.545

		Population with tertiary education	Lifelong learning	Scientific co-publications	Most-cited publications	R&D expenditure public sector	R&D expenditure business sector	Non-R&D innovation expenditures	Product or process innovators	Marketing or organisational innovators
DE60	Hamburg	0.508	0.297	0.809	0.511	0.699	0.572	0.443	0.676	0.713
DE71	Darmstadt	0.519	0.269	0.573	0.546	0.580	0.821	0.600	0.642	0.616
DE72	Gießen	0.402	0.342	0.744	0.515	0.749	0.601	0.544	0.608	0.644
DE73	Kassel	0.307	0.242	0.284	0.463	0.416	0.555	0.444	0.655	0.570
DE80	Mecklenburg-Vorpommern	0.101	0.236	0.559	0.458	0.785	0.380	0.556	0.664	0.608
DE91	Braunschweig	0.377	0.279	0.813	0.596	1.000	1.000	0.903	0.764	0.612
DE92	Hannover	0.320	0.224	0.558	0.406	0.680	0.619	0.361	0.535	0.562
DE93	Lüneburg	0.151	0.191	0.195	0.611	0.244	0.437	0.472	0.496	0.659
DE94	Weser-Ems	0.165	0.167	0.308	0.414	0.397	0.380	0.516	0.404	0.572
DEA1	Düsseldorf	0.318	0.203	0.454	0.595	0.446	0.584	0.451	0.532	0.624
DEA2	Köln	0.424	0.242	0.739	0.587	0.932	0.539	0.534	0.549	0.607
DEA3	Münster	0.244	0.227	0.440	0.523	0.501	0.380	0.660	0.682	0.636
DEA4	Detmold	0.232	0.212	0.348	0.503	0.446	0.617	0.602	0.668	0.545
DEA5	Arnsberg	0.241	0.239	0.450	0.434	0.571	0.505	0.646	0.539	0.534
DEB1	Koblenz	0.246	0.206	0.203	0.384	0.297	0.343	0.677	0.501	0.603
DEB2	Trier	0.391	0.215	0.301	0.441	1.000	0.359	0.757	0.689	0.366
DEB3	Rheinhessen-Pfalz	0.269	0.245	0.666	0.595	0.446	0.890	0.854	0.509	0.624
DEC0	Saarland	0.206	0.212	0.545	0.434	0.647	0.394	0.515	0.632	0.673
DED2	Dresden	0.277	0.285	0.790	0.536	1.000	0.713	0.777	0.660	0.588
DED4	Chemnitz	0.215	0.194	0.337	0.380	0.630	0.496	0.731	0.618	0.563
DED5	Leipzig	0.478	0.275	0.818	0.523	0.901	0.284	0.788	0.685	0.649
DEE0	Sachsen-Anhalt	0.095	0.200	0.493	0.443	0.730	0.289	0.829	0.541	0.525
DEF0	Schleswig-Holstein	0.212	0.239	0.529	0.530	0.585	0.437	0.402	0.506	0.538
DEG0	Thüringen	0.199	0.242	0.551	0.579	0.719	0.493	0.811	0.558	0.548
EE	Estonia									
IE	Ireland									
IE04	Northern and Western	0.679	0.209	0.618	0.580	0.384	0.460	0.519	0.493	0.553
IE05	Southern	0.636	0.239	0.618	0.580	0.571	0.555	0.589	0.589	0.669
IE06	Eastern and Midland	0.783	0.279	0.618	0.580	0.356	0.445	0.432	0.529	0.655
EL	Greece									
EL51	Anatoliki Makedonia, Thraki	0.408	0.151	0.309	0.341	0.502	0.133	0.944	0.497	0.654
EL52	Kentriki Makedonia	0.580	0.103	0.480	0.451	0.535	0.207	0.746	0.637	0.641
EL53	Dytiki Makedonia	0.395	0.139	0.236	0.716	0.398	0.095	0.788	0.444	0.412
EL54	Ipeiros	0.499	0.039	0.707	0.458	0.712	0.143	0.561	0.516	0.515
EL61	Thessalia	0.497	0.058	0.351	0.395	0.512	0.063	0.615	0.660	0.661
EL62	Ionia Nisia	0.156	0.058	0.180	0.230	0.431	0.063	0.939	0.510	0.531
EL63	Dytiki Ellada	0.447	0.088	0.554	0.355	0.712	0.222	0.595	0.718	0.674
EL64	Sterea Ellada	0.388	0.024	0.155	0.238	0.246	0.328	0.656	0.662	0.621
EL65	Peloponnisos	0.399	0.033	0.148	0.255	0.368	0.080	0.725	0.683	0.502
EL30	Attiki	0.646	0.182	0.540	0.396	0.493	0.419	0.441	0.651	0.613
EL41	Voreio Aigaio	0.463	0.094	0.290	0.319	0.553	0.080	0.315	0.557	0.483
EL42	Notio Aigaio	0.269	0.027	0.092	0.423	0.237	0.028	0.373	0.406	0.560
EL43	Kriti	0.452	0.097	0.653	0.579	0.805	0.164	0.940	0.758	0.688
ES	Spain									
ES11	Galicia	0.562	0.266	0.477	0.394	0.446	0.307	0.259	0.252	0.310
ES12	Principado de Asturias	0.654	0.254	0.520	0.447	0.416	0.276	0.218	0.308	0.290
ES13	Cantabria	0.607	0.306	0.547	0.435	0.491	0.251	0.234	0.218	0.281

		Population with tertiary education	Lifelong learning	Scientific co-publications	Most-cited publications	R&D expenditure public sector	R&D expenditure business sector	Non-R&D innovation expenditures	Product or process innovators	Marketing or organisational innovators
ES21	País Vasco	0.733	0.381	0.588	0.489	0.458	0.612	0.335	0.350	0.349
ES22	Comunidad Foral de Navarra	0.715	0.321	0.583	0.460	0.480	0.533	0.274	0.352	0.341
ES23	La Rioja	0.548	0.279	0.417	0.428	0.440	0.303	0.252	0.353	0.315
ES24	Aragón	0.593	0.348	0.565	0.442	0.434	0.332	0.267	0.305	0.336
ES30	Comunidad de Madrid	0.605	0.330	0.673	0.454	0.580	0.489	0.248	0.256	0.391
ES41	Castilla y León	0.452	0.279	0.402	0.354	0.440	0.399	0.317	0.203	0.276
ES42	Castilla-la Mancha	0.354	0.260	0.303	0.327	0.288	0.276	0.248	0.201	0.248
ES43	Extremadura	0.422	0.263	0.310	0.236	0.463	0.137	0.274	0.232	0.301
ES51	Cataluña	0.548	0.215	0.660	0.542	0.532	0.457	0.291	0.290	0.403
ES52	Comunidad Valenciana	0.445	0.333	0.491	0.404	0.517	0.307	0.342	0.248	0.392
ES53	Illes Balears	0.447	0.242	0.411	0.481	0.320	0.100	0.255	0.125	0.235
ES61	Andalucía	0.334	0.242	0.439	0.402	0.512	0.276	0.229	0.189	0.323
ES62	Región de Murcia	0.321	0.330	0.433	0.372	0.474	0.312	0.356	0.225	0.311
ES63	Ciudad Autónoma de Ceuta	0.226	0.275	0.137	0.000	0.104	0.007	0.000	0.025	0.105
ES64	Ciudad Autónoma de Melilla	0.343	0.351	0.122	0.380	0.168	0.046	0.086	0.198	0.334
ES70	Canarias	0.366	0.260	0.424	0.340	0.410	0.110	0.273	0.200	0.300
FR	France									
FR1	Île de France	0.812	0.524	0.723	0.556	0.651	0.733	0.413	0.573	0.638
FRB	Centre - Val de Loire	0.415	0.539	0.378	0.502	0.458	0.551	0.743	0.543	0.595
FRC	Bourgogne - Franche-Comté	0.384	0.512	0.382	0.542	0.396	0.585	0.632	0.581	0.583
FRD	Normandie	0.309	0.481	0.329	0.463	0.367	0.516	0.695	0.507	0.504
FRE	Nord-Pas de Calais - Picardie	0.377	0.466	0.383	0.453	0.418	0.403	0.452	0.479	0.509
FRF	Alsace - Champagne-Ardenne - Lorraine	0.422	0.497	0.493	0.520	0.535	0.410	0.592	0.521	0.589
FRG	Pays de la Loire	0.609	0.636	0.425	0.497	0.434	0.445	0.483	0.548	0.604
FRH	Bretagne	0.454	0.605	0.493	0.516	0.608	0.569	0.672	0.468	0.511
FRI	Aquitaine - Limousin - Poitou-Charentes	0.530	0.578	0.441	0.540	0.482	0.453	0.682	0.499	0.548
FRJ	Languedoc-Roussillon - Midi-Pyrénées	0.512	0.633	0.631	0.557	0.878	0.780	0.573	0.613	0.675
FRK	Auvergne - Rhône-Alpes	0.539	0.696	0.622	0.543	0.659	0.697	0.703	0.608	0.643
FRL	Provence-Alpes-Côte d'Azur	0.510	0.466	0.563	0.545	0.692	0.635	0.487	0.528	0.651
FRM	Corse	0.320	0.221	0.194	0.496	0.313	0.064	0.510	0.412	0.528
FRY	Régions ultra¬périphériques françaises	0.259	0.272	0.097	0.636	0.537	0.089	0.555	0.387	0.507
HR	Croatia									
HR03	Jadranska Hrvatska	0.250	0.039	0.360	0.184	0.305	0.137	0.969	0.333	0.444
HR04	Kontinentalna Hrvatska	0.262	0.061	0.427	0.207	0.517	0.360	0.881	0.484	0.515
IT	Italy									
ITC1	Piemonte	0.217	0.221	0.468	0.475	0.404	0.691	0.584	0.618	0.460
ITC2	Valle d'Aosta/Vallée d'Aoste	0.196	0.230	0.283	0.728	0.181	0.316	0.374	0.369	0.296
ITC3	Liguria	0.169	0.263	0.604	0.535	0.532	0.486	0.453	0.432	0.516
ITC4	Lombardia	0.348	0.245	0.535	0.567	0.328	0.495	0.481	0.636	0.573
ITH1	Provincia Autonoma Bolzano/ Bozen	0.185	0.288	0.437	0.633	0.214	0.320	0.564	0.540	0.526
ITH2	Provincia Autonoma Trento	0.347	0.327	0.852	0.628	0.680	0.378	0.599	0.566	0.506
ITH3	Veneto	0.239	0.257	0.516	0.487	0.397	0.478	0.569	0.648	0.539
ITH4	Friuli-Venezia Giulia	0.259	0.300	0.781	0.515	0.580	0.463	0.764	0.661	0.553

		Population with tertiary education	Lifelong learning	Scientific co-publications	Most-cited publications	R&D expenditure public sector	R&D expenditure business sector	Non-R&D innovation expenditures	Product or process innovators	Marketing or organisational innovators
ITH5	Emilia-Romagna	0.280	0.285	0.608	0.472	0.458	0.628	0.507	0.683	0.521
ITI1	Toscana	0.251	0.254	0.649	0.510	0.522	0.419	0.495	0.526	0.441
ITI2	Umbria	0.277	0.254	0.590	0.583	0.566	0.285	0.620	0.581	0.471
ITI3	Marche	0.336	0.206	0.440	0.386	0.404	0.396	0.671	0.609	0.468
ITI4	Lazio	0.284	0.254	0.638	0.468	0.696	0.406	0.408	0.529	0.484
ITF1	Abruzzo	0.206	0.167	0.499	0.506	0.501	0.324	0.649	0.555	0.491
ITF2	Molise	0.212	0.197	0.451	0.405	0.371	0.412	0.632	0.440	0.417
ITF3	Campania	0.127	0.173	0.431	0.541	0.552	0.348	0.615	0.425	0.498
ITF4	Puglia	0.142	0.142	0.385	0.496	0.485	0.246	0.591	0.463	0.528
ITF5	Basilicata	0.268	0.200	0.413	0.326	0.446	0.153	0.768	0.545	0.429
ITF6	Calabria	0.115	0.163	0.374	0.535	0.458	0.128	0.531	0.421	0.442
ITG1	Sicilia	0.086	0.136	0.387	0.477	0.480	0.235	0.649	0.447	0.420
ITG2	Sardegna	0.167	0.239	0.465	0.359	0.580	0.145	0.347	0.367	0.408
CY	Cyprus									
LV	Latvia									
LT	Lithuania									
LT01	Sostinės regionas	1.000	0.157	0.352	0.198	0.501	0.251	0.997	0.613	0.482
LT02	Vidurio ir vakarų Lietuvos regionas	0.664	0.160	0.352	0.198	0.501	0.251	0.869	0.503	0.411
LU	Luxembourg									
HU	Hungary									
HU11	Budapest	0.666	0.257	0.569	0.334	0.428	0.595	0.642	0.297	0.286
HU12	Pest	0.329	0.167	0.569	0.334	0.428	0.595	0.954	0.226	0.208
HU21	Közép-Dunántúl	0.153	0.133	0.235	0.467	0.244	0.406	0.609	0.188	0.170
HU22	Nyugat-Dunántúl	0.224	0.124	0.199	0.189	0.214	0.307	0.623	0.250	0.226
HU23	Dél-Dunántúl	0.228	0.127	0.321	0.167	0.271	0.175	0.688	0.250	0.200
HU31	Észak-Magyarország	0.223	0.109	0.163	0.285	0.113	0.261	0.869	0.264	0.227
HU32	Észak-Alföld	0.181	0.188	0.380	0.248	0.313	0.399	0.645	0.224	0.196
HU33	Dél-Alföld	0.203	0.170	0.396	0.257	0.364	0.396	0.506	0.245	0.227
MT	Malta									
NL	Netherlands									
NL11	Groningen	0.594	0.633	1.000	0.693	0.857	0.316	0.400	0.568	0.388
NL12	Friesland	0.463	0.478	0.255	0.470	0.054	0.549	0.352	0.466	0.311
NL13	Drenthe	0.400	0.472	0.406	0.634	0.151	0.329	0.395	0.568	0.389
NL21	Overijssel	0.575	0.527	0.582	0.691	0.542	0.575	0.359	0.499	0.337
NL22	Gelderland	0.497	0.563	0.889	0.736	0.741	0.545	0.383	0.518	0.349
NL23	Flevoland	0.445	0.560	0.314	0.637	0.634	0.439	0.381	0.543	0.374
NL31	Utrecht	0.822	0.642	1.000	0.744	0.838	0.363	0.409	0.595	0.410
NL32	Noord-Holland	0.751	0.599	0.914	0.747	0.630	0.459	0.368	0.517	0.364
NL33	Zuid-Holland	0.603	0.581	0.844	0.687	0.736	0.540	0.382	0.528	0.360
NL34	Zeeland	0.260	0.442	0.322	0.595	0.151	0.488	0.357	0.498	0.335
NL41	Noord-Brabant	0.560	0.524	0.514	0.642	0.428	0.862	0.365	0.509	0.343
NL42	Limburg	0.512	0.497	0.789	0.654	0.579	0.644	0.357	0.494	0.330
AT	Austria									
AT1	Ostösterreich	0.551	0.509	0.775	0.569	0.788	0.663	0.386	0.630	0.677
AT2	Südösterreich	0.404	0.421	0.629	0.443	0.705	1.000	0.701	0.580	0.661
AT3	Westösterreich	0.422	0.421	0.575	0.488	0.496	0.760	0.592	0.697	0.670

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PL	Poland									
PL21	Malopolskie	0.623	0.157	0.461	0.247	0.474	0.665	0.669	0.223	0.123
PL22	Slaskie	0.549	0.118	0.240	0.182	0.253	0.280	0.449	0.200	0.124
PL41	Wielkopolskie	0.487	0.067	0.301	0.241	0.335	0.261	0.469	0.191	0.115
PL42	Zachodniopomorskie	0.485	0.067	0.224	0.180	0.335	0.160	0.684	0.163	0.087
PL43	Lubuskie	0.372	0.045	0.186	0.215	0.129	0.153	0.467	0.178	0.131
PL51	Dolnoslaskie	0.576	0.082	0.362	0.256	0.297	0.328	0.606	0.161	0.108
PL52	Opolskie	0.447	0.082	0.187	0.160	0.253	0.188	0.404	0.167	0.074
PL61	Kujawsko-Pomorskie	0.382	0.097	0.247	0.266	0.193	0.219	0.539	0.188	0.092
PL62	Warminsko-Mazurskie	0.361	0.054	0.215	0.239	0.263	0.160	0.431	0.126	0.047
PL63	Pomorskie	0.618	0.142	0.322	0.263	0.371	0.451	0.476	0.230	0.145
PL71	Lódzkie	0.553	0.067	0.300	0.214	0.306	0.286	0.531	0.168	0.112
PL72	Swietokrzyskie	0.566	0.070	0.170	0.255	0.276	0.286	0.529	0.140	0.072
PL81	Lubelskie	0.470	0.112	0.264	0.210	0.468	0.280	0.490	0.300	0.088
PL82	Podkarpackie	0.490	0.045	0.176	0.178	0.271	0.580	0.527	0.232	0.147
PL84	Podlaskie	0.551	0.085	0.265	0.249	0.364	0.260	0.408	0.139	0.130
PL91	Warszawski stoleczny	1.000	0.260	0.467	0.259	0.526	0.507	0.421	0.285	0.220
PL92	Mazowiecki regionalny	0.449	0.039	0.467	0.259	0.526	0.507	0.300	0.135	0.080
PT	Portugal									
PT11	Norte	0.300	0.239	0.533	0.428	0.566	0.412	0.831	0.772	0.574
PT15	Algarve	0.273	0.242	0.506	0.333	0.350	0.089	0.630	0.870	0.725
PT16	Centro	0.395	0.275	0.579	0.477	0.527	0.402	0.795	0.848	0.670
PT17	Lisboa	0.427	0.369	0.680	0.427	0.621	0.438	0.484	0.853	0.703
PT18	Alentejo	0.235	0.239	0.333	0.238	0.328	0.241	0.735	0.804	0.629
PT20	Região Autónoma dos Açores	--	0.160	0.347	0.241	0.328	0.032	0.643	0.795	0.700
PT30	Região Autónoma da Madeira	0.293	0.227	0.321	0.750	0.305	0.100	0.617	0.715	0.559
RO	Romania									
RO11	Nord-Vest	0.219	0.015	0.336	0.247	0.253	0.110	0.180	0.078	0.139
RO12	Centru	0.221	0.015	0.208	0.146	0.078	0.246	0.184	0.043	0.049
RO21	Nord-Est	0.074	0.015	0.221	0.220	0.253	0.064	0.217	0.045	0.126
RO22	Sud-Est	0.041	0.000	0.109	0.213	0.143	0.009	0.411	0.144	0.103
RO31	Sud - Muntenia	0.027	0.024	0.062	0.179	0.097	0.276	0.142	0.022	0.020
RO32	Bucuresti - Ilfov	0.672	0.021	0.503	0.212	0.469	0.356	0.227	0.062	0.077
RO41	Sud-Vest Oltenia	0.131	0.003	0.121	0.160	0.204	0.032	0.064	0.031	0.000
RO42	Vest	0.183	0.015	0.274	0.284	0.193	0.276	0.180	0.022	0.077
SI	Slovenia									
SI03	Vzhodna Slovenija	0.510	0.303	0.317	0.394	0.156	0.607	0.469	0.340	0.327
SI04	Zahodna Slovenija	0.648	0.394	0.826	0.417	0.621	0.654	0.437	0.394	0.369
SK	Slovakia									
SK01	Bratislavský kraj	0.842	0.157	0.827	0.295	0.590	0.406	0.342	0.317	0.339
SK02	Západné Slovensko	0.307	0.079	0.206	0.197	0.271	0.266	0.640	0.252	0.199
SK03	Stredné Slovensko	0.282	0.061	0.246	0.224	0.350	0.261	0.626	0.296	0.261
SK04	Východné Slovensko	0.264	0.082	0.364	0.277	0.343	0.219	0.922	0.241	0.230
FI	Finland									
FI1B	Helsinki-Uusimaa	0.686	0.902	0.952	0.541	0.745	0.799	0.476	0.794	0.578
FI1C	Etelä-Suomi	0.431	0.772	0.780	0.538	0.585	0.543	0.347	0.827	0.649
FI19	Länsi-Suomi	0.526	0.781	0.624	0.415	0.634	0.676	0.565	0.732	0.526

		Population with tertiary education	Lifelong learning	Scientific co-publications	Most-cited publications	R&D expenditure public sector	R&D expenditure business sector	Non-R&D innovation expenditures	Product or process innovators	Marketing or organisational innovators
FI1D	Pohjois- ja Itä-Suomi	0.426	0.751	0.679	0.512	0.684	0.641	0.623	0.733	0.581
FI20	Åland	--	0.724	0.181	0.000	0.078	0.251	0.791	0.662	0.424
SE	Sweden									
SE11	Stockholm	0.855	0.939	1.000	0.621	0.687	0.881	0.456	0.591	0.534
SE12	Östra Mellansverige	0.571	0.914	1.000	0.536	0.900	0.802	0.695	0.510	0.394
SE21	Småland med öarna	0.503	0.826	0.373	0.487	0.307	0.579	0.731	0.658	0.497
SE22	Sydsverige	0.688	0.939	0.872	0.587	0.786	0.742	0.470	0.534	0.473
SE23	Västsverige	0.643	0.929	0.739	0.630	0.650	0.901	0.545	0.523	0.509
SE31	Norra Mellansverige	0.542	0.823	0.313	0.349	0.299	0.525	0.499	0.483	0.341
SE32	Mellersta Norrland	0.465	0.805	0.324	0.256	0.322	0.340	0.650	0.484	0.402
SE33	Övre Norrland	0.497	0.814	1.000	0.488	1.000	0.406	0.670	0.495	0.437
UK	United Kingdom									
UKC	North East	0.445	0.357	0.648	0.681	0.474	0.356	0.605	0.481	0.512
UKD	North Wes	0.528	0.406	0.499	0.678	0.440	0.571	0.587	0.479	0.518
UKE	Yorkshire and The Humber	0.481	0.424	0.612	0.662	0.480	0.381	0.606	0.530	0.471
UKF	East Midlands	0.494	0.400	0.551	0.620	0.404	0.623	0.559	0.591	0.551
UKG	West Midlands	0.458	0.342	0.536	0.731	0.378	0.657	0.596	0.622	0.510
UKH	East of England	0.465	0.381	0.745	0.881	0.608	0.853	0.246	0.630	0.578
UKI	London	0.928	0.460	0.912	0.815	0.485	0.344	0.387	0.450	0.519
UKJ	South East	0.600	0.466	0.775	0.759	0.552	0.654	0.500	0.642	0.546
UKK	South West	0.575	0.478	0.597	0.739	0.446	0.520	0.582	0.542	0.542
UKL	Wales	0.447	0.406	0.576	0.621	0.428	0.399	1.000	0.511	0.564
UKM	Scotland	0.776	0.406	0.788	0.705	0.625	0.419	0.558	0.506	0.535
UKN	Northern Ireland	0.377	0.275	0.547	0.595	0.416	0.546	0.569	0.487	0.540
NO	Norway									
NO01	Oslo og Akershus	0.860	0.663	1.000	0.511	0.921	0.652	0.604	0.839	0.761
NO02	Hedmark og Oppland	0.399	0.545	0.366	0.439	0.379	0.335	0.570	0.895	0.784
NO03	Sør-Østlandet	0.483	0.521	0.290	0.469	0.357	0.595	0.726	0.775	0.675
NO04	Agder og Rogaland	0.435	0.542	0.430	0.510	0.386	0.469	0.646	0.814	0.740
NO05	Vestlandet	0.657	0.575	0.857	0.510	0.776	0.451	0.501	0.755	0.672
NO06	Trøndelag	0.716	0.609	1.000	0.541	1.000	0.917	0.569	0.800	0.782
NO07	Nord-Norge	0.390	0.587	0.855	0.399	0.881	0.335	0.928	0.753	0.627
CH	Switzerland									
CH01	Région lémanique	0.695	0.817	1.000	0.754	0.676	0.807	--	0.509	0.527
CH02	Espace Mittelland	0.646	0.914	0.821	0.562	0.676	0.807	--	0.589	0.865
CH03	Nordwestschweiz	0.618	0.948	1.000	0.760	0.676	0.807	--	0.525	0.673
CH04	Zürich	0.903	1.000	1.000	0.842	0.676	0.807	--	0.700	0.840
CH05	Ostschweiz	0.479	0.896	0.472	0.664	0.676	0.807	--	0.776	0.843
CH06	Zentralschweiz	0.700	0.993	0.425	0.565	0.676	0.807	--	0.607	0.729
CH07	Ticino	0.724	0.775	0.702	0.479	0.676	0.807	--	0.880	0.971
RS	Serbia									
RS11	Belgrade	0.562	0.170	0.323	0.192	0.648	0.336	0.537	0.484	0.434
RS12	Vojvodina	0.230	0.127	0.323	0.192	0.472	0.307	0.704	0.486	0.474
RS21	Šumadija and Western Serbia	0.178	0.076	0.323	0.192	0.174	0.043	0.769	0.523	0.494
RS22	Southern and Eastern Serbia	0.223	0.082	0.323	0.192	0.251	0.092	0.802	0.510	0.365

		SMEs innovating in-house	Innovative SMEs collaborating with others	Public-private co-publications	PCT patent applications	Trademark applications	Design applications	Employment MHT manufacturing & knowledge-intensive services	Sales of new-to-market and new-to-firm innovations
EU28	EU28								
BE	Belgium								
BE1	Région de Bruxelles-Capitale								
BE2	Vlaams Gewest	0.627	0.823	0.607	0.443	0.463	0.413	0.513	0.787
BE3	Région Wallonne	0.627	0.539	0.489	0.372	0.357	0.334	0.370	0.768
BG	Bulgaria								
BG31	Severozapaden	0.238	0.072	0.061	0.051	0.123	0.263	0.248	0.535
BG32	Severen tsentralen	0.211	0.093	0.038	0.188	0.403	0.640	0.289	0.404
BG33	Severoiztochen	0.150	0.067	0.080	0.059	0.166	0.714	0.301	0.257
BG34	Yugoiztochen	0.215	0.086	0.117	0.059	0.301	0.451	0.338	0.411
BG41	Yugozapaden	0.232	0.169	0.155	0.157	0.626	0.491	0.591	0.417
BG42	Yuzhen tsentralen	0.209	0.087	0.066	0.051	0.493	0.504	0.215	0.503
CZ	Czechia								
CZ01	Praha	0.519	0.497	0.513	0.168	0.296	0.385	0.804	0.535
CZ02	Střední Cechy	0.499	0.305	0.111	0.239	0.179	0.462	0.771	0.421
CZ03	Jihozápad	0.350	0.415	0.201	0.152	0.327	1.000	0.697	0.414
CZ04	Severozápad	0.339	0.385	0.149	0.137	0.235	0.120	0.468	0.563
CZ05	Severovýchod	0.526	0.453	0.330	0.221	0.442	0.688	0.767	0.651
CZ06	Jihovýchod	0.524	0.459	0.335	0.167	0.167	0.306	0.652	0.453
CZ07	Střední Morava	0.509	0.432	0.296	0.191	0.231	0.606	0.632	0.417
CZ08	Moravskoslezsko	0.538	0.394	0.117	0.148	0.194	0.488	0.681	0.529
DK	Denmark								
DK01	Hovedstaden	0.695	0.470	1.000	0.726	0.874	0.742	0.632	0.471
DK02	Sjælland	0.495	0.404	0.387	0.378	0.421	0.355	0.411	0.563
DK03	Syddanmark	0.565	0.420	0.375	0.496	0.571	0.484	0.358	0.351
DK04	Midtjylland	0.674	0.441	0.492	0.626	0.766	0.723	0.452	0.446
DK05	Nordjylland	0.679	0.384	0.485	0.562	0.551	0.647	0.358	0.464
DE	Germany								
DE11	Stuttgart	0.653	0.230	0.480	0.907	0.495	0.860	1.000	0.565
DE12	Karlsruhe	0.657	0.326	0.620	0.763	0.551	0.496	0.804	0.531
DE13	Freiburg	0.654	0.220	0.643	0.723	0.482	0.590	0.624	0.544
DE14	Tübingen	0.726	0.197	0.541	0.752	0.529	0.540	0.832	0.614
DE21	Oberbayern	0.572	0.258	0.791	0.821	0.771	0.771	0.902	0.535
DE22	Niederbayern	0.565	0.158	0.101	0.564	0.313	0.413	0.705	0.629
DE23	Oberpfalz	0.527	0.223	0.474	1.000	0.303	0.624	0.750	0.430
DE24	Oberfranken	0.473	0.246	0.523	0.704	0.512	0.721	0.575	0.523
DE25	Mittelfranken	0.551	0.256	0.675	0.903	0.553	0.825	0.624	0.531
DE26	Unterfranken	0.492	0.271	0.401	0.716	0.464	0.579	0.693	0.490
DE27	Schwaben	0.624	0.182	0.374	0.626	0.504	0.582	0.722	0.583
DE30	Berlin	0.659	0.593	0.692	0.522	0.922	0.670	0.693	0.600
DE40	Brandenburg	0.495	0.504	0.322	0.384	0.253	0.277	0.329	0.446
DE50	Bremen	0.581	0.217	0.739	0.232	0.424	0.436	0.546	0.374
DE60	Hamburg	0.688	0.273	0.632	0.395	0.772	0.640	0.742	0.250
DE71	Darmstadt	0.638	0.191	0.697	0.628	0.539	0.569	0.722	0.503
DE72	Gießen	0.657	0.333	0.392	0.558	0.364	0.501	0.517	0.579
DE73	Kassel	0.682	0.280	0.266	0.328	0.316	0.311	0.575	0.477

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DE80	Mecklenburg-Vorpommern	0.636	0.537	0.297	0.219	0.213	0.334	0.252	0.452
DE91	Braunschweig	0.811	0.207	0.631	0.558	0.221	0.260	0.816	0.438
DE92	Hannover	0.580	0.285	0.420	0.568	0.422	0.619	0.493	0.489
DE93	Lüneburg	0.505	0.137	0.209	0.439	0.407	0.574	0.444	0.533
DE94	Weser-Ems	0.377	0.139	0.131	0.352	0.364	0.397	0.428	0.458
DEA1	Düsseldorf	0.501	0.151	0.513	0.559	0.559	0.642	0.530	0.437
DEA2	Köln	0.555	0.224	0.548	0.564	0.558	0.465	0.603	0.565
DEA3	Münster	0.712	0.264	0.248	0.437	0.458	0.605	0.436	0.609
DEA4	Detmold	0.689	0.171	0.233	0.520	0.551	0.948	0.489	0.548
DEA5	Arnsberg	0.501	0.213	0.272	0.444	0.425	0.948	0.513	0.480
DEB1	Koblenz	0.477	0.343	0.182	0.436	0.512	0.623	0.428	0.436
DEB2	Trier	0.645	0.138	0.153	0.412	0.542	0.416	0.370	0.514
DEB3	Rheinhessen-Pfalz	0.523	0.294	0.837	0.753	0.413	0.648	0.714	0.668
DEC0	Saarland	0.625	0.242	0.409	0.453	0.303	0.395	0.522	0.431
DED2	Dresden	0.638	0.589	0.393	0.530	0.279	0.468	0.546	0.520
DED4	Chemnitz	0.590	0.621	0.277	0.360	0.204	0.388	0.558	0.544
DED5	Leipzig	0.662	0.589	0.245	0.259	0.302	0.192	0.530	0.609
DEE0	Sachsen-Anhalt	0.540	0.601	0.356	0.213	0.148	0.231	0.362	0.493
DEF0	Schleswig-Holstein	0.478	0.253	0.353	0.462	0.474	0.628	0.395	0.321
DEG0	Thüringen	0.522	0.611	0.393	0.478	0.215	0.295	0.464	0.542
EE	Estonia								
IE	Ireland								
IE04	Northern and Western	0.528	0.381	0.430	0.258	0.315	0.323	0.423	0.483
IE05	Southern	0.612	0.434	0.430	0.258	0.135	0.138	0.517	0.603
IE06	Eastern and Midland	0.522	0.377	0.430	0.258	0.426	0.334	0.661	0.427
EL	Greece								
EL51	Anatoliki Makedonia, Thraki	0.466	0.449	0.000	0.041	0.080	0.071	0.121	0.416
EL52	Kentriki Makedonia	0.644	0.788	0.170	0.092	0.325	0.360	0.235	0.761
EL53	Dytiki Makedonia	0.465	0.825	0.170	0.102	0.076	0.280	--	0.979
EL54	Ipeiros	0.504	0.563	0.000	0.047	0.144	--	--	0.269
EL61	Thessalia	0.652	0.922	0.000	0.105	0.221	0.058	0.126	0.783
EL62	Ionia Nisia	0.536	0.543	0.000	0.092	0.056	--	--	0.769
EL63	Dytiki Ellada	0.706	0.801	0.325	0.059	0.166	0.139	0.105	0.541
EL64	Sterea Ellada	0.686	0.596	0.000	0.046	0.095	0.146	--	0.645
EL65	Peloponnisos	0.644	0.723	0.000	0.042	0.154	0.064	0.105	0.536
EL30	Attiki	0.633	0.809	0.295	0.152	0.362	0.234	0.575	0.607
EL41	Voreio Aigaio	0.454	0.701	0.000	0.060	0.181	0.127	--	0.472
EL42	Notio Aigaio	0.423	0.188	0.000	0.069	0.202	0.071	--	0.168
EL43	Kriti	0.783	1.000	0.000	0.171	0.323	0.269	--	1.000
ES	Spain								
ES11	Galicia	0.220	0.325	0.149	0.123	0.402	0.168	0.325	0.455
ES12	Principado de Asturias	0.276	0.276	0.215	0.129	0.195	0.298	0.329	0.599
ES13	Cantabria	0.200	0.186	0.227	0.226	0.202	0.150	0.350	0.972
ES21	País Vasco	0.346	0.444	0.328	0.248	0.419	0.271	0.611	0.834
ES22	Comunidad Foral de Navarra	0.342	0.300	0.168	0.294	0.502	0.276	0.652	0.777
ES23	La Rioja	0.334	0.321	0.000	0.105	1.000	0.563	0.252	0.678

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ES24	Aragón	0.275	0.263	0.261	0.277	0.424	0.255	0.415	0.521
ES30	Comunidad de Madrid	0.215	0.216	0.481	0.235	0.617	0.264	0.718	0.456
ES41	Castilla y León	0.176	0.132	0.140	0.126	0.255	0.208	0.309	0.575
ES42	Castilla-la Mancha	0.177	0.119	0.163	0.107	0.367	0.295	0.219	0.412
ES43	Extremadura	0.178	0.229	0.129	0.122	0.242	0.087	0.109	0.500
ES51	Cataluña	0.261	0.204	0.397	0.351	0.792	0.451	0.583	0.599
ES52	Comunidad Valenciana	0.220	0.190	0.188	0.254	0.855	0.703	0.313	0.565
ES53	Illes Balears	0.094	0.062	0.072	0.086	0.879	0.560	0.227	0.512
ES61	Andalucía	0.155	0.132	0.231	0.212	0.311	0.218	0.256	0.524
ES62	Región de Murcia	0.194	0.220	0.143	0.214	0.735	0.453	0.235	0.434
ES63	Ciudad Autónoma de Ceuta	0.030	0.270	0.000	--	0.284	0.388	--	0.384
ES64	Ciudad Autónoma de Melilla	0.187	0.064	0.266	--	0.087	0.169	--	0.548
ES70	Canarias	0.149	0.059	0.175	--	--	--	0.182	0.456
FR	France								
FR1	Île de France	0.581	0.480	0.569	0.531	0.446	0.475	0.693	0.360
FRB	Centre - Val de Loire	0.513	0.453	0.336	0.430	0.137	0.231	0.309	0.502
FRC	Bourgogne - Franche-Comté	0.554	0.452	0.284	0.402	0.161	0.409	0.411	0.478
FRD	Normandie	0.464	0.442	0.269	0.396	0.115	0.331	0.428	0.535
FRE	Nord-Pas de Calais - Picardie	0.463	0.337	0.300	0.364	0.155	0.392	0.358	0.361
FRF	Alsace - Champagne-Ardenne - Lorraine	0.500	0.345	0.349	0.371	0.230	0.272	0.366	0.655
FRG	Pays de la Loire	0.541	0.497	0.361	0.322	0.155	0.451	0.452	0.407
FRH	Bretagne	0.472	0.412	0.377	0.520	0.229	0.265	0.313	0.543
FRI	Aquitaine - Limousin - Poitou-Charentes	0.482	0.422	0.356	0.337	0.257	0.333	0.325	0.596
FRJ	Languedoc-Roussillon - Midi-Pyrénées	0.603	0.605	0.467	0.416	0.213	0.388	0.460	0.487
FRK	Auvergne - Rhône-Alpes	0.607	0.534	0.490	0.691	0.251	0.430	0.448	0.504
FRL	Provence-Alpes-Côte d'Azur	0.529	0.439	0.414	0.430	0.311	0.336	0.403	0.646
FRM	Corse	0.346	0.124	0.088	0.074	0.148	0.159	--	0.271
FRY	Régions ultra¬périphériques françaises	0.365	0.271	0.048	0.071	--	--	0.149	0.235
HR	Croatia								
HR03	Jadranska Hrvatska	0.309	0.249	0.123	0.111	0.140	0.147	0.366	0.341
HR04	Kontinentalna Hrvatska	0.461	0.365	0.314	0.120	0.164	0.290	0.387	0.434
IT	Italy								
ITC1	Piemonte	0.673	0.166	0.285	0.369	0.342	0.441	0.677	0.716
ITC2	Valle d'Aosta/Vallée d'Aoste	0.387	0.136	0.000	0.275	0.156	0.554	--	0.772
ITC3	Liguria	0.450	0.099	0.260	0.279	0.220	0.171	0.505	0.641
ITC4	Lombardia	0.670	0.235	0.421	0.350	0.584	0.583	0.738	0.682
ITH1	Provincia Autonoma Bolzano/ Bozen	0.512	0.146	0.189	0.195	0.636	0.410	0.231	0.628
ITH2	Provincia Autonoma Trento	0.580	0.131	0.241	0.264	0.413	0.494	0.370	0.655
ITH3	Veneto	0.656	0.161	0.247	0.370	0.673	0.858	0.526	0.683
ITH4	Friuli-Venezia Giulia	0.693	0.248	0.392	0.432	0.428	0.792	0.517	0.679
ITH5	Emilia-Romagna	0.740	0.144	0.351	0.460	0.573	0.727	0.595	0.680
ITI1	Toscana	0.564	0.256	0.379	0.383	0.473	0.512	0.411	0.686
ITI2	Umbria	0.596	0.126	0.251	0.216	0.296	1.000	0.415	0.650

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ITI3	Marche	0.661	0.274	0.191	0.256	0.587	0.898	0.464	0.691
ITI4	Lazio	0.540	0.196	0.347	0.175	0.364	0.274	0.538	0.664
ITF1	Abruzzo	0.596	0.122	0.194	0.184	0.349	0.360	0.428	0.692
ITF2	Molise	0.474	0.063	0.142	0.122	0.111	0.048	0.432	0.684
ITF3	Campania	0.460	0.101	0.160	0.143	0.336	0.250	0.383	0.643
ITF4	Puglia	0.496	0.178	0.152	0.143	0.249	0.409	0.248	0.628
ITF5	Basilicata	0.575	0.158	0.105	0.129	0.186	0.269	0.477	0.689
ITF6	Calabria	0.464	0.195	0.080	0.121	0.150	0.037	0.191	0.596
ITG1	Sicilia	0.474	0.233	0.274	0.108	0.145	0.127	0.240	0.606
ITG2	Sardegna	0.395	0.088	0.246	0.111	0.108	0.117	0.248	0.603
CY	Cyprus								
LV	Latvia								
LT	Lithuania								
LT01	Sostinės regionas	0.582	0.679	0.125	0.083	0.582	0.417	0.477	0.525
LT02	Vidurio ir vakarų Lietuvos regionas	0.496	0.508	0.125	0.083	0.215	0.125	0.174	0.431
LU	Luxembourg								
HU	Hungary								
HU11	Budapest	0.272	0.277	0.525	0.288	0.365	0.213	0.779	0.247
HU12	Pest	0.197	0.149	0.525	0.288	0.309	0.532	0.616	0.375
HU21	Közép-Dunántúl	0.158	0.106	0.164	0.135	0.084	0.139	0.746	0.322
HU22	Nyugat-Dunántúl	0.216	0.170	0.000	0.131	0.149	0.278	0.738	0.557
HU23	Dél-Dunántúl	0.240	0.192	0.356	0.187	0.080	0.110	0.297	0.563
HU31	Észak-Magyarország	0.246	0.195	0.079	0.110	0.113	0.141	0.640	0.393
HU32	Észak-Alföld	0.210	0.134	0.155	0.117	0.168	0.153	0.301	0.330
HU33	Dél-Alföld	0.209	0.168	0.368	0.227	0.139	0.081	0.297	0.299
MT	Malta								
NL	Netherlands								
NL11	Groningen	0.437	0.530	0.419	0.321	0.239	0.221	0.403	0.655
NL12	Friesland	0.437	0.431	0.216	0.342	0.321	0.242	0.342	0.601
NL13	Drenthe	0.437	0.536	0.313	0.244	0.297	0.694	0.407	0.612
NL21	Overijssel	0.437	0.464	0.522	0.349	0.342	0.551	0.428	0.594
NL22	Gelderland	0.437	0.478	0.517	0.417	0.511	0.483	0.419	0.620
NL23	Flevoland	0.437	0.483	0.344	0.365	0.639	0.306	0.481	0.612
NL31	Utrecht	0.437	0.523	0.946	0.386	0.517	0.488	0.607	0.671
NL32	Noord-Holland	0.437	0.450	0.602	0.324	0.670	0.421	0.587	0.603
NL33	Zuid-Holland	0.437	0.487	0.696	0.438	0.476	0.371	0.542	0.613
NL34	Zeeland	0.437	0.497	0.251	0.327	0.329	0.185	0.456	0.602
NL41	Noord-Brabant	0.437	0.472	0.780	1.000	0.633	0.716	0.542	0.603
NL42	Limburg	0.437	0.467	0.544	0.719	0.442	0.600	0.415	0.590
AT	Austria								
AT1	Ostösterreich	0.594	0.681	0.583	0.426	0.724	0.408	0.517	0.491
AT2	Südösterreich	0.528	0.711	0.620	0.545	0.572	0.543	0.460	0.570
AT3	Westösterreich	0.663	0.856	0.548	0.626	0.745	0.801	0.460	0.589
PL	Poland								
PL21	Malopolskie	0.200	0.205	0.193	0.208	0.445	0.635	0.399	0.297

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PL22	Slaskie	0.193	0.153	0.130	0.103	0.225	0.591	0.538	0.231
PL41	Wielkopolskie	0.178	0.111	0.063	0.117	0.352	0.796	0.366	0.255
PL42	Zachodniopomorskie	0.151	0.102	0.000	0.082	0.143	0.419	0.297	0.245
PL43	Lubuskie	0.173	0.119	0.000	0.055	0.302	0.639	--	0.260
PL51	Dolnoslaskie	0.159	0.120	0.190	0.138	0.211	0.505	0.656	0.305
PL52	Opolskie	0.145	0.111	0.000	0.077	0.250	0.579	--	0.321
PL61	Kujawsko-Pomorskie	0.159	0.125	0.000	0.088	0.258	0.626	0.309	0.300
PL62	Warminsko-Mazurskie	0.116	0.111	0.000	0.058	0.174	0.362	0.215	0.348
PL63	Pomorskie	0.190	0.126	0.220	0.170	0.285	0.381	0.460	0.266
PL71	Lódzkie	0.165	0.107	0.118	0.103	0.538	0.467	0.395	0.224
PL72	Swietokrzyskie	0.146	0.095	0.075	0.089	0.177	0.569	0.185	0.396
PL81	Lubelskie	0.225	0.121	0.081	0.113	0.102	0.336	0.174	0.264
PL82	Podkarpackie	0.223	0.310	0.058	0.122	0.274	0.604	0.354	0.582
PL84	Podlaskie	0.127	0.104	0.077	0.039	0.154	0.383	0.154	0.356
PL91	Warszawski stoleczny	0.258	0.201	0.249	0.140	0.576	0.487	0.779	0.348
PL92	Mazowiecki regionalny	0.109	0.073	0.249	0.140	0.173	0.336	0.186	0.144
PT	Portugal								
PT11	Norte	0.783	0.269	0.174	0.172	0.699	0.665	0.334	0.540
PT15	Algarve	0.919	0.277	0.313	0.063	0.207	0.129	--	0.311
PT16	Centro	0.859	0.406	0.212	0.150	0.406	0.399	0.231	0.563
PT17	Lisboa	0.854	0.408	0.319	0.126	0.483	0.268	0.473	0.529
PT18	Alentejo	0.822	0.338	0.142	0.130	0.400	0.088	0.119	0.492
PT20	Região Autónoma dos Açores	0.824	0.106	0.000	0.080	0.083	--	--	0.338
PT30	Região Autónoma da Madeira	0.702	0.146	0.000	0.071	0.521	0.239	--	0.362
RO	Romania								
RO11	Nord-Vest	0.087	0.079	0.071	0.067	0.168	0.252	0.280	0.110
RO12	Centru	0.049	0.012	0.105	0.065	0.139	0.298	0.460	0.160
RO21	Nord-Est	0.043	0.054	0.045	0.050	0.110	0.157	0.064	0.196
RO22	Sud-Est	0.151	0.030	0.051	0.045	0.043	0.035	0.235	0.243
RO31	Sud - Muntenia	0.019	0.016	0.046	0.059	0.068	0.107	0.379	0.130
RO32	Bucuresti - Ilfov	0.059	0.074	0.323	0.088	0.265	0.438	0.705	0.138
RO41	Sud-Vest Oltenia	0.036	0.075	0.000	0.044	0.073	0.075	0.168	0.082
RO42	Vest	0.022	0.034	0.000	0.081	0.138	0.179	0.938	0.083
SI	Slovenia								
SI03	Vzhodna Slovenija	0.329	0.361	0.413	0.548	0.379	0.307	0.599	0.461
SI04	Zahodna Slovenija	0.374	0.459	0.542	0.206	0.578	0.440	0.673	0.348
SK	Slovakia								
SK01	Bratislavský kraj	0.303	0.374	0.386	0.114	0.378	0.339	0.914	0.771
SK02	Západné Slovensko	0.246	0.235	0.080	0.117	0.191	0.390	0.759	0.433
SK03	Stredné Slovensko	0.285	0.267	0.059	0.070	0.137	0.223	0.481	0.399
SK04	Východné Slovensko	0.212	0.222	0.268	0.092	0.174	0.228	0.399	0.428
FI	Finland								
FI1B	Helsinki-Uusimaa	0.772	0.805	0.771	0.877	0.996	0.549	0.808	0.628
FI1C	Etelä-Suomi	0.820	0.721	0.410	0.489	0.423	0.412	0.489	0.575
FI19	Länsi-Suomi	0.718	0.696	0.595	0.703	0.459	0.525	0.493	0.446
FI1D	Pohjois- ja Itä-Suomi	0.752	0.696	0.446	0.551	0.324	0.347	0.338	0.456

		SMEs innovating in-house	Innovative SMEs collaborating with others	Public-private co-publications	PCT patent applications	Trademark applications	Design applications	Employment MHT manufacturing & knowledge-intensive services	Sales of new-to-market and new-to-firm innovations
FI20	Åland	0.625	0.838	0.000	0.083	--	--	--	0.110
SE	Sweden								
SE11	Stockholm	0.594	0.563	0.838	0.914	0.954	0.482	0.934	0.469
SE12	Östra Mellansverige	0.461	0.428	0.730	0.778	0.344	0.352	0.628	0.514
SE21	Småland med öarna	0.582	0.462	0.212	0.599	0.408	0.740	0.456	0.510
SE22	Sydsverige	0.507	0.409	0.570	1.000	0.826	0.553	0.603	0.407
SE23	Västsverige	0.528	0.347	1.000	0.670	0.691	0.532	0.701	0.576
SE31	Norra Mellansverige	0.464	0.275	0.346	0.526	0.347	0.347	0.432	0.354
SE32	Mellersta Norrland	0.469	0.579	0.260	0.421	0.221	0.321	0.436	0.403
SE33	Övre Norrland	0.523	0.561	0.470	0.409	0.313	0.325	0.305	0.462
UK	United Kingdom								
UKC	North East	0.492	0.944	0.280	0.467	0.114	0.238	0.460	1.000
UKD	North Wes	0.489	0.939	0.470	0.352	0.204	0.189	0.452	0.934
UKE	Yorkshire and The Humber	0.542	1.000	0.431	0.360	0.282	0.459	0.370	0.783
UKF	East Midlands	0.604	0.980	0.470	0.357	0.254	0.325	0.481	1.000
UKG	West Midlands	0.628	1.000	0.314	0.445	0.304	0.541	0.485	1.000
UKH	East of England	0.637	1.000	0.868	0.610	0.357	0.392	0.538	0.380
UKI	London	0.453	0.891	0.558	0.270	0.625	0.439	0.783	0.722
UKJ	South East	0.655	1.000	0.638	0.473	0.378	0.444	0.640	1.000
UKK	South West	0.543	1.000	0.384	0.484	0.295	0.616	0.489	1.000
UKL	Wales	0.522	0.968	0.313	0.313	0.158	0.210	0.338	1.000
UKM	Scotland	0.517	1.000	0.355	0.399	0.208	0.187	0.379	0.966
UKN	Northern Ireland	0.498	0.820	0.276	0.232	0.191	0.207	0.403	0.645
NO	Norway								
NO01	Oslo og Akershus	0.700	0.656	0.735	0.405	0.362	0.116	0.644	0.576
NO02	Hedmark og Oppland	0.734	0.653	0.341	0.171	0.108	0.073	0.231	0.376
NO03	Sør-Østlandet	0.644	0.692	0.377	0.426	0.172	0.206	0.440	0.509
NO04	Agder og Rogaland	0.686	0.792	0.584	0.584	0.153	0.130	0.419	0.514
NO05	Vestlandet	0.627	0.769	0.568	0.411	0.165	0.298	0.432	0.494
NO06	Trøndelag	0.653	1.000	0.806	0.746	0.074	0.117	0.346	0.428
NO07	Nord-Norge	0.625	0.823	0.282	0.183	0.099	0.173	0.231	0.429
CH	Switzerland								
CH01	Région lémanique	0.461	0.176	0.983	0.747	0.744	0.401	0.558	0.303
CH02	Espace Mittelland	0.586	0.276	0.583	0.491	0.419	0.432	0.575	0.494
CH03	Nordwestschweiz	0.518	0.146	1.000	0.766	0.654	0.422	0.705	0.584
CH04	Zürich	0.636	0.361	0.988	0.635	0.526	0.272	0.759	0.615
CH05	Ostschweiz	0.633	0.501	0.426	0.564	0.619	1.000	0.579	0.913
CH06	Zentralschweiz	0.511	0.386	0.822	0.555	1.000	0.643	0.652	0.474
CH07	Ticino	0.975	0.403	0.563	0.550	1.000	0.524	0.526	0.768
RS	Serbia								
RS11	Belgrade	0.342	0.220	0.136	--	0.085	0.024	0.558	0.451
RS12	Vojvodina	0.327	0.340	0.136	--	0.048	0.091	0.338	0.623
RS21	Šumadija and Western Serbia	0.379	0.102	0.136	--	0.043	0.044	0.101	0.527
RS22	Southern and Eastern Serbia	0.333	0.285	0.136	--	0.071	0.040	0.191	0.347

Annex 4: Regional profiles

This annex shows an example of a regional profile. Final profiles for all regions will look slightly different and 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)

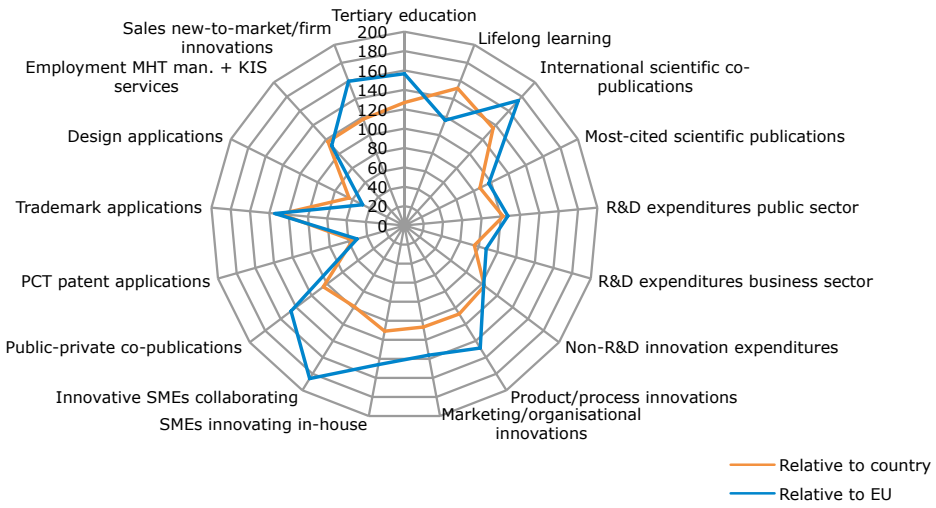
	Data	Normalised score	Relative to BE	Relative to EU
Tertiary education	54.4	0.720	127	157
Lifelong learning	12.6	0.363	152	117
International scientific co-publications	3146	1.000	136	174
Most-cited scientific publications	0.108	0.527	87	97
R&D expenditures public sector	0.78	0.612	102	107
R&D expenditures business sector	1.05	0.518	75	88
Non-R&D innovation expenditures	±	0.508	±	±
Product/process innovations	±	0.732	±	±
Marketing/ org. innovations	±	0.637	±	±
SMEs innovating in-house	±	0.704	±	±
Innovative SMEs collaborating	±	0.748	±	±
Public-private co-publications	88.0	0.599	105	147
EPO patent applications	2.29	0.217	55	51
Trademark applications	8.38	0.595	128	134
Design applications	1.11	0.236	64	48
Employment MHT manuf./KIS services	16.7	0.558	117	111
Sales new-to-market/firm innovations	±	0.962	±	±
Average score	--	0.602	--	--
Country EIS-RIS correction factor	--	0.984	--	--
Regional Innovation Index 2019	--	0.592	--	--
RII 2019 (same year)	--	--		121.9
RII 2019 (cf. to EU 2011)	--	--	--	127.7
Regional Innovation Index 2011	--	0.530	--	--
RII 2011 (same year)	--	--	98.1	114.2
RII - change between 2011 and 2019	--	13.5	--	--
RII - change between 2011 and 2017	--	1.2	--	--

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

The Brussels region is a **Strong + Innovator**.

The table on the left shows the normalised scores per indicator and relative results compared to the country and the EU. The table also shows the RII in 2019 compared to that of the country and the EU in 2019, the RII in 2019 to that of the EU in 2011, and performance change over time. The radar graph shows relative strengths compared to Belgium (red line) and the EU (blue line), highlighting relative strengths and weaknesses. The table below shows data highlighting structural differences. For instance, Brussels is a highly densely populated area with higher employment shares in services and public administration.

	BE1	BE	EU
Share of employment in:			
Agriculture & Mining (A-B)	0.0	1.2	4.6
Manufacturing (C)	4.9	12.7	15.4
Utilities & Construction (D-F)	7.5	8.4	8.2
Services (G-N)	72.6	68.2	64.1
Public administration (O-U)	14.8	9.4	7.0
Average employed persons per enterprise (firm size), 2015-2016	4.4	4.4	5.5
GDP per capita (PPS), 2017	58,700	35,000	30,000
GDP per capita growth (PPS), 2013-2017	0.83	2.19	2.86
Population density, 2017	7422	374	118
Urbanisation, 2018	100.0	88.1	76.0
Population size, 2018 (000s)	1,210	11,400	512,380



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