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on the 8th Cohesion Report: Cohesion in Europe towards 2050

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CHAPTER 1 The regional dimension of the COVID-19 pandemic

- The outbreak of the COVID-19 pandemic has led to at least 872,000 more deaths in the EU compared to previous years. Excess mortality was higher in less developed regions than in transition and more developed ones. While the first wave affected primarily north-western regions and southern regions, the following waves led to the highest mortality in eastern regions.
- The restrictions put in place to contain the pandemic led to the deepest post-1945 recession. The impact was largest on southern regions, especially those dependent on tourism, where the reduction in hours worked and GDP were the most severe.
- The travel restrictions not only affected the tourism sector, but also border areas where people could no longer cross a national border to go to work or to access services.
- Thanks to job retention schemes the impact of employment and unemployment was much smaller compared to the reduction in hours worked and GDP. This allowed the EU to avoid a big spike in unemployment.
- The number of people usually working from home doubled. This increase was highest in many of the capital regions. These regions typically have a more developed service economy, host jobs that can more easily be done remotely, have a highly educated labour force and high quality IT infrastructure. All these factors facilitated the increase in working from home.

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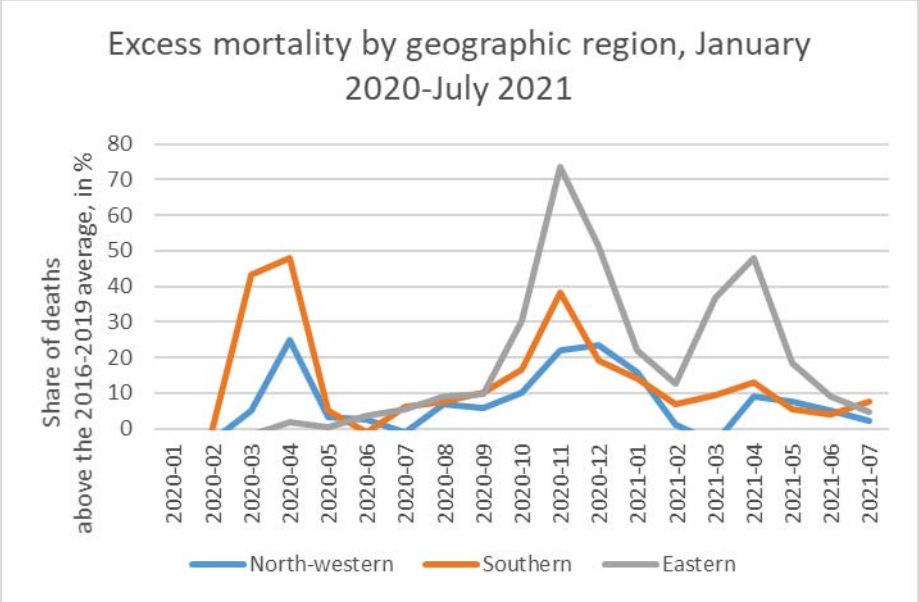
1.1 The health impact of the pandemic

Between March 2020 and July 2021, the COVID-19 pandemic has led to excess mortality[1] in the EU of at least 872,000 deaths. In other words, compared to the average of the five previous years, the number of deaths since the start of the pandemic was 13% higher. This includes deaths directly resulting from COVID-19 and those caused indirectly because of the saturation of hospital capacity and lack of usual care. For example, half the NUTS-3 regions, for which data are available, experienced at least one week with over double the usual mortality (Map 1.1).

The excess mortality during the first wave mainly affected regions in Italy, Spain, France, Belgium and the Netherlands. During the second wave, excess mortality was highest predominantly in regions in Eastern Europe, in Poland, Bulgaria, Slovenia, Czechia, Romania and Hungary.

Figure 1.1 Excess mortality rate by geographic region, January 2020-July 2021



Source: Eurostat [demo_mexrt] and REGIO calculations

Regional excess mortality since the start of the pandemic shows the cumulative impact of the different waves (Map 1.1). It reveals hotspots in northern Italy and Madrid, which were heavily affected in the first wave, as well as in Poland, Czechia, Slovakia and Bulgaria, which were more affected in later waves. Overall[2], less developed regions had the highest excess mortality rate (17% higher) as compared with transition (11%) and more developed regions (12%).

Map 1.1 Excess mortality since week 9 of 2020

[1] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Excess_mortality_-_statistics

[2] Data for Ireland, Slovenia and three German regions (DE9, DEB, DED) are missing at the regional level.

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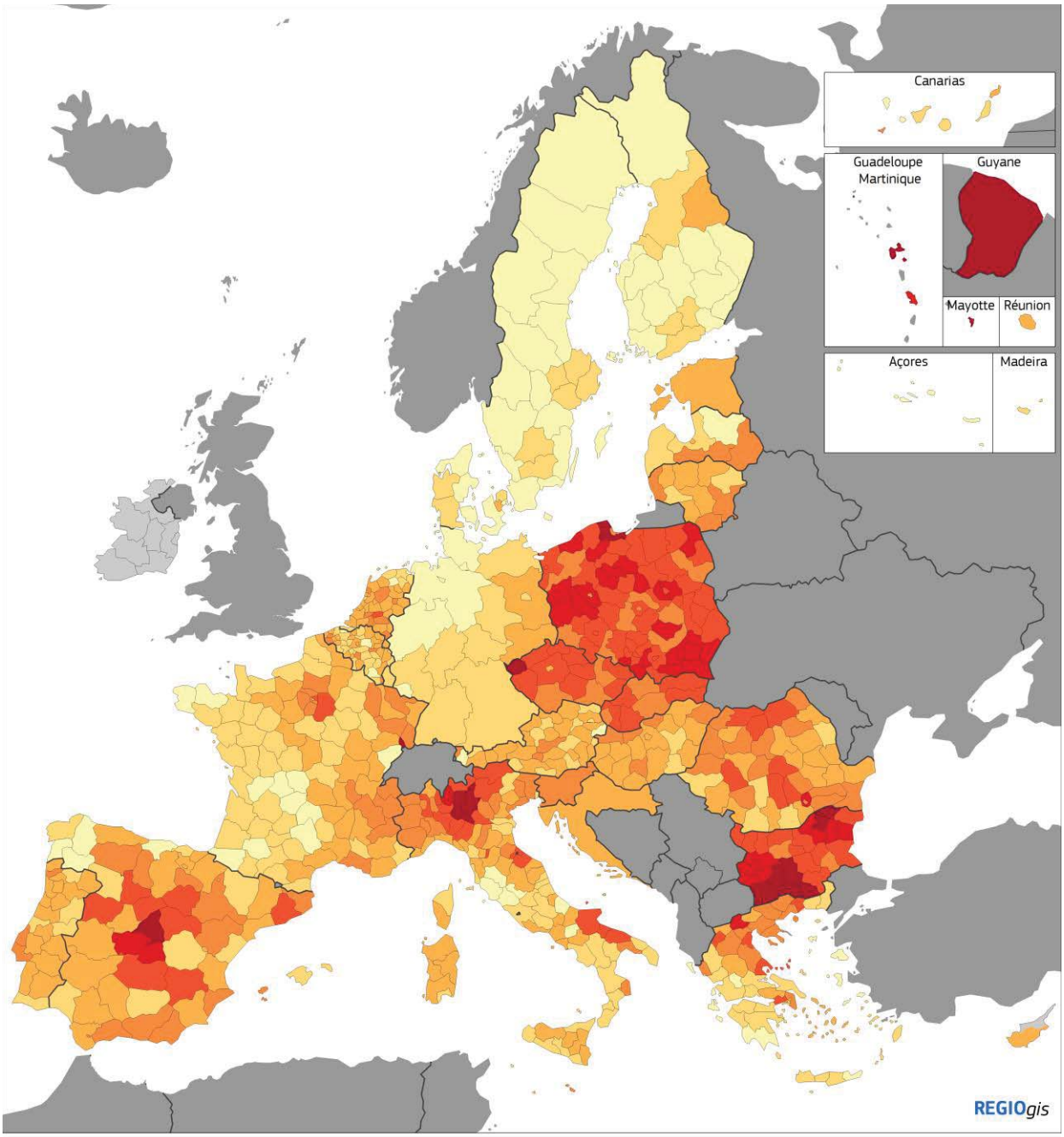

Excess mortality since week 9 of 2020

% compared to average 2015-2019

<= 5	20 - 25
5 - 10	25 - 30
10 - 15	> 30
15 - 20	no data

The most recent week for which data are available varies between week 38 of 2021 and week 47 of 2021.
Source: Eurostat (demo_r_mweek3) - data extracted on 02/12/2021

0 500 km

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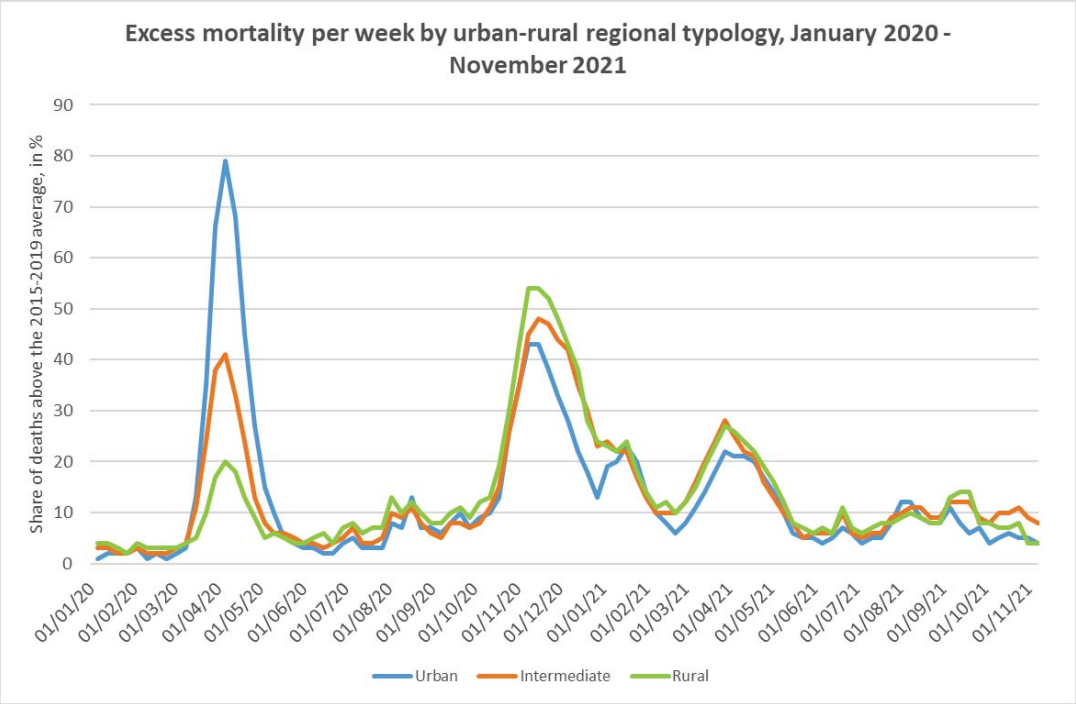
The excess mortality rate during the first wave was highest in urban regions and peaked at 80% in April 2020, while it was lower than 40% in intermediate regions and only 20% in rural regions. During the second wave, rural regions had the highest excess rate, which peaked at 55%, while it was somewhat lower in towns and suburbs (48%) and cities (43%) (Figure 1.2).

Figure 1.2: Excess mortality per week by urban-rural typology, January 2020-November2021



Source: Eurostat demo_r_mweek3 and JRC modelling

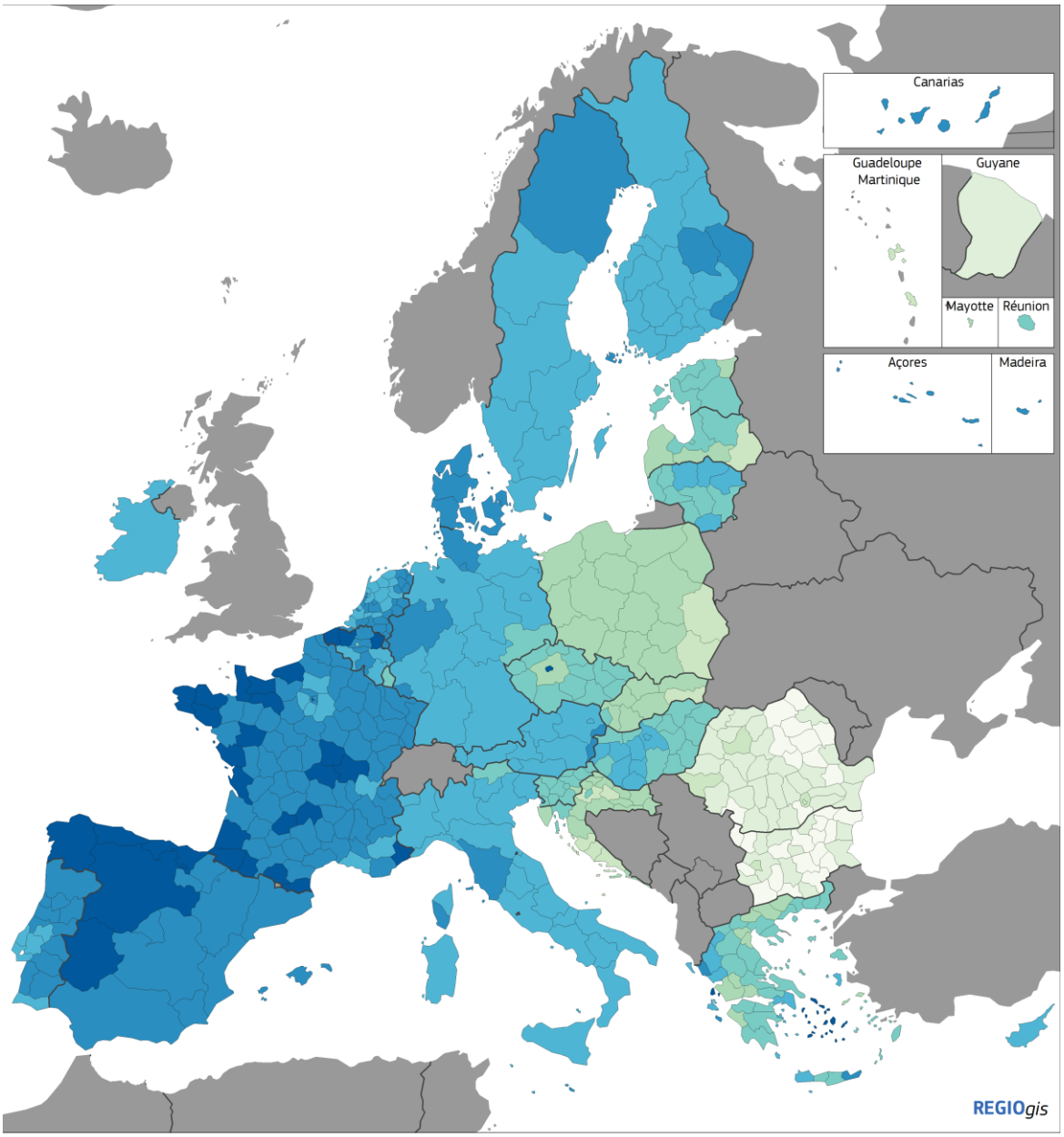
Note: Because of missing NUTS-3 data, Germany, Estonia, Ireland, Croatia, Malta and Slovenia are not included.

Because of COVID-19, life expectancy in 2020 fell in almost all Member States. The biggest reductions were in Spain (-1.6 years) and Bulgaria (-1.5 years). In only two Member States, Denmark and Finland did life expectancy increase, though only marginally[3].

Vaccines offer the best way out of the pandemic. In November 2021, approximately 70% of the total population was fully vaccinated. Uptake of vaccinations, however, differed between and within Member States. Data reported in November indicated that in multiple regions in Romania and Bulgaria less than 20% of the population was fully vaccinated, while in many regions in Belgium, France and Spain more than 80% of the population was fully vaccinated (Map 1.2.

[3] Data for Ireland were not yet available for 2020.

Map 1.2 People fully vaccinated against COVID-19, November 2021



People fully vaccinated against COVID-19, November 2021*

% of total population *

- <= 20.0
- 20.1 - 30.0
- 30.1 - 40.0
- 40.1 - 50.0
- 50.1 - 60.0
- 60.1 - 70.0
- 70.1 - 80.0
- > 80.0

* Data have been accessed early November 2021. Due to the variety in sources, the actual periods covered and the definitions used are not necessarily harmonised.
Source: DG REGIO calculationq based on data from ECDC, national sources and Eurostat

0 500 km

© EuroGeographics Association for the administrative boundaries

Cities and regions in the frontline to fight the pandemic

The Annual EU Regional and Local Barometer report by the European Committee of the Regions highlights the current and future challenges for cities and regions in the European Union. The latest edition[4] of this report covers a wide range of issues including the potential asymmetric financial and health impacts of the pandemic[5] and the Recovery and Resilience Plans.

The report highlights the concern that the pandemic may reduce subnational finance through a combination of falling revenues and rising expenditures[6]. A first rough estimate indicates that this could lead to a funding gap of €180 billion for EU local and regional authorities, if left unaddressed. Fortunately, significant EU and national support to local and regional authorities is likely to have mitigated this effect, but it may still leave some regions and cities more exposed than others. The report also discusses the multiple causes of the asymmetric health impact of the pandemic, ranging from different age structure, mobility, restrictions, underlying health issues, the difference in healthcare capacity and the varied uptake of the vaccines. The report concludes only a place-sensitive policy response can factor in these big spatial differences.

The report argues that local and regional authorities should be closely involved in the preparation and implementation of the national Recovery and Resilience Plans. A first assessment indicates that local and regional authorities were not consistently consulted during the preparation of these plans and that some of these consultation only had a limited impact on the final plans.

[4] CoR, EU Annual Regional and Local Barometer, October 2021. Available online: https://cor.europa.eu/en/our-work/Documents/barometer-fullreport%20web.pdf

[5] The territorial impact of COVID-19: Managing the crisis across levels of government, November 2020. Available online: https://www.oecd.org/coronavirus/policy-responses/the-territorial-impact-of-COVID-19-managing-the-crisis-across-levels-of-government-d3e314e1/

[6] CoR, Study: Local and regional finances in the aftermath of COVID-19. June 2021. Available online at: https://cor.europa.eu/en/engage/studies/Documents/Local%20and%20regional%20finances%20in%20the%20aftermath%20of%20COVID-19/CoR_Local_and_regional_finances_after_Covid-19.pdf

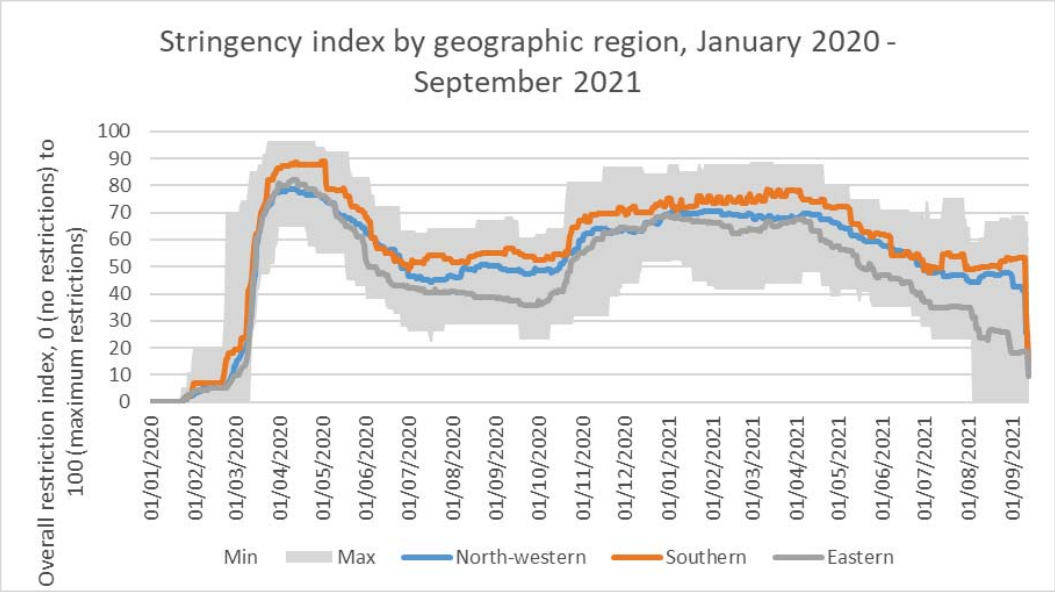
1.2 The economic impact of the pandemic

The depth of the economic recession during the pandemic was affected by three main factors. First, the length and the strictness of lockdown measures implemented by national, regional and local authorities to limit the spread of the virus. The places with stricter lockdown measures tended to experience a deeper recession[7]. Second, some types of economic activities were much more affected than others. Services, notably accommodation and those relating to culture, leisure, tourism and activities requiring proximity generally have particularly suffered from the containment measures. Member States and regions that are more dependent on these sectors, have seen a bigger drop in their economic activity. Third, the policy response of Member States, regions and local authorities varied in scope and intensity, in part reflecting the differential impact of the pandemic.

1.2.1 Pandemic restrictions

Restrictions imposed in response to the pandemic did not differ greatly between EU Member States (Figure 1.3). Restrictions peaked in April 2020, were relaxed in summer 2020, and were increased again during autumn and winter 2020-2021. Restrictions started to recede slowly in May 2021 and continued to do so up to September. On average, restrictions in eastern Member States were slightly less strict, while southern Member States had the tightest ones and north-western Member States were in between the two.

Figure 1.3 Stringency index by geographic region, January 2020 - September 2021



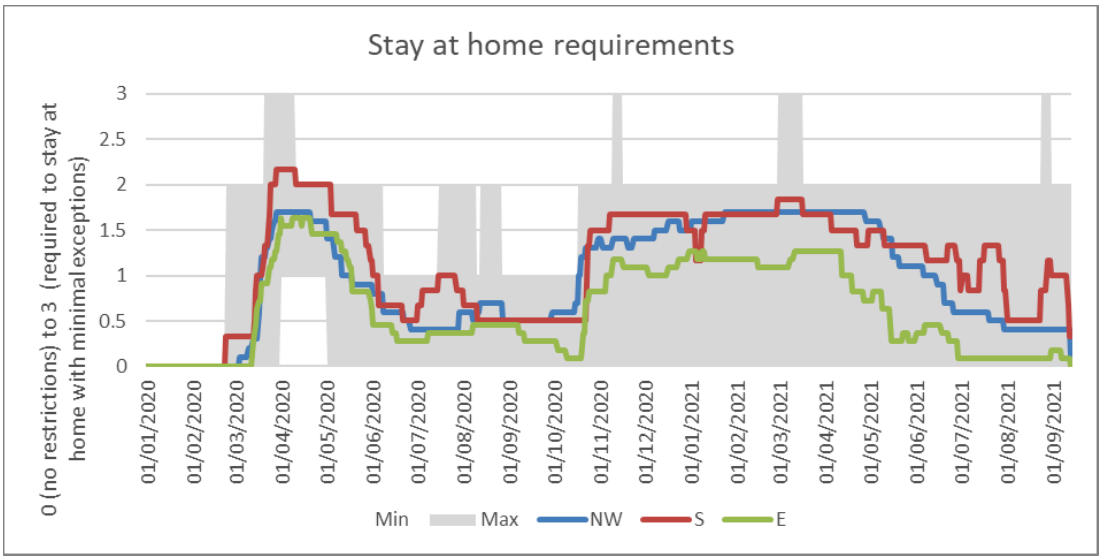
Source: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government, University of Oxford. Unweighted averages of country indices.

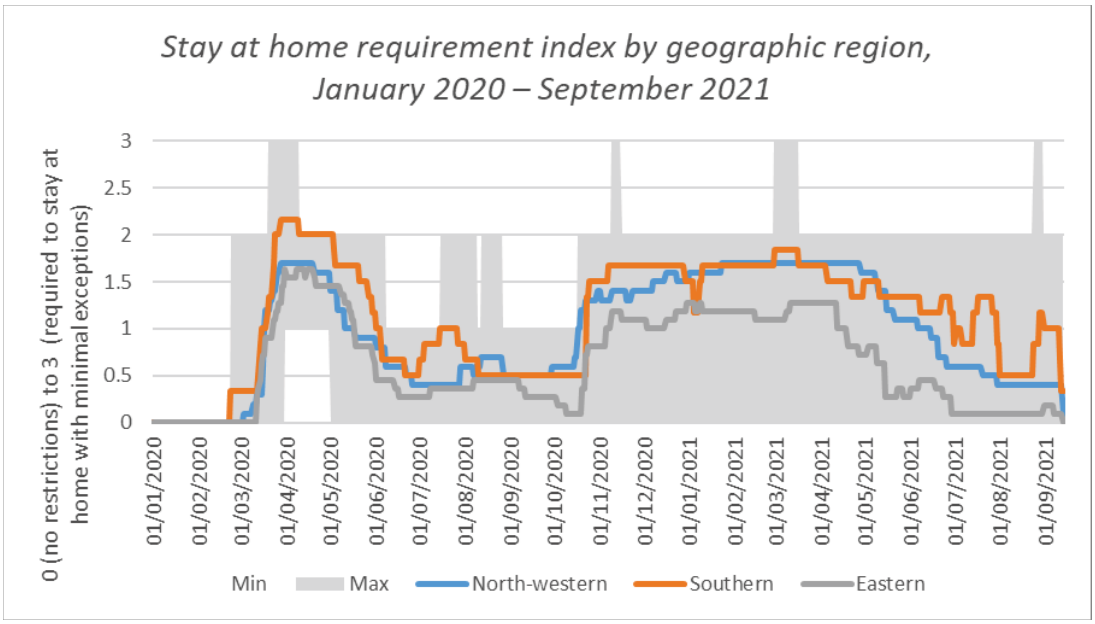
The difference between Member States, however, was greater as regards specific kinds of restriction. For example, some Member States had long periods during which people were required not to leave their homes except for a short period of daily exercise, grocery shopping or essential trips (Figure 1.3). On the other hand, some Member States imposed no stay-at-home requirements for almost the whole period, while others imposed only modest restrictions. Eastern Member States tended to have the least restrictions and the southern ones the most. During the first wave, north-western Member

[7] Sapir, A. (2020), "Why has COVID-19 hit different European Union economies so differently", Bruegel, Issue 18

States imposed similar restrictions to the eastern ones, while during the second and third waves, they had a stricter approach more similar to southern Member States.

Figure 1.4 Stay at home requirement index by geographic region, January 2020 – September 2021



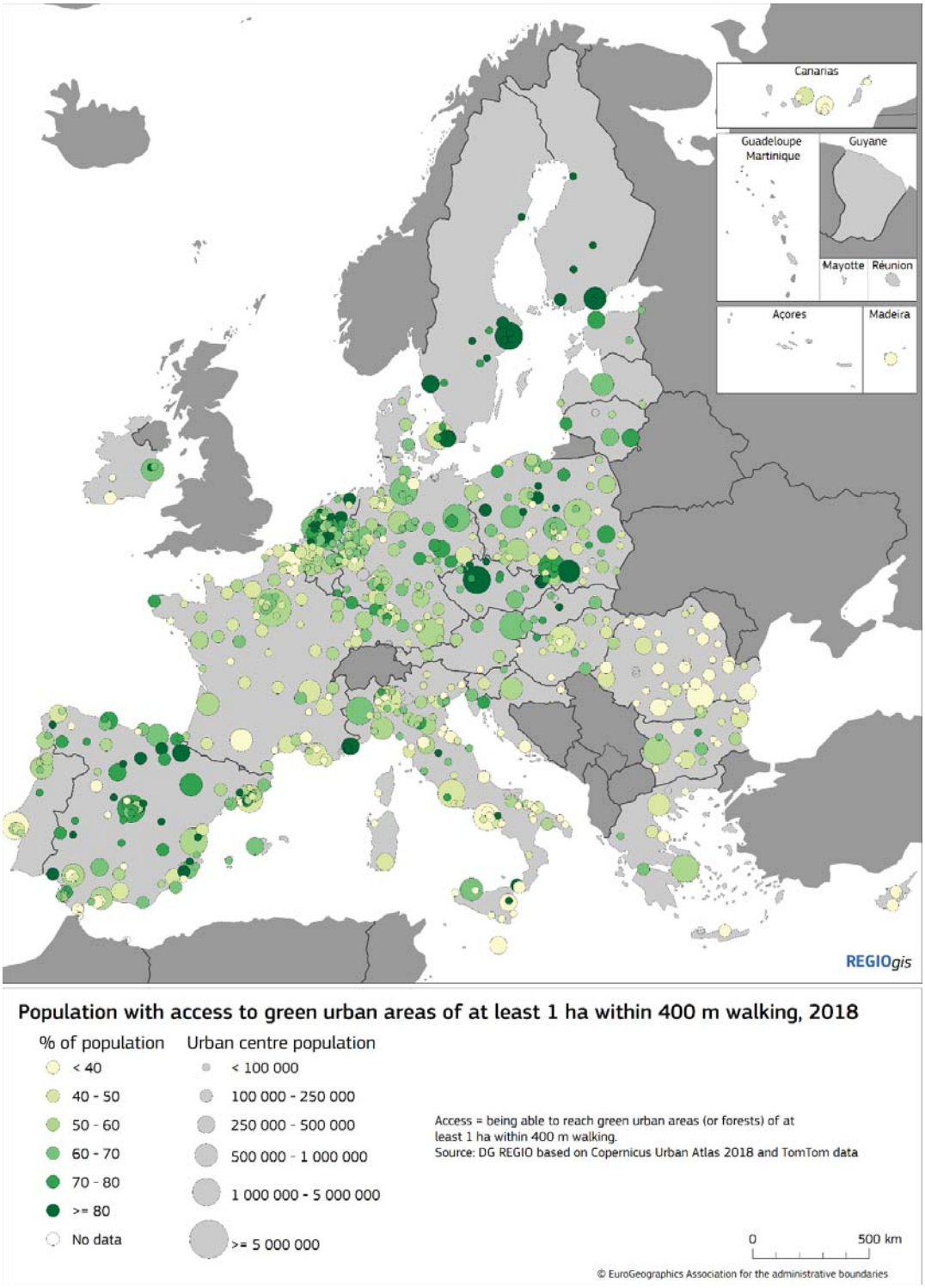


Source: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government, University of Oxford. Unweighted averages of country indices.

The stay-at-home requirements and the internal movement restrictions meant that people had to rely more on local facilities and amenities. The requirement to work from home and the closure of schools meant that many people in cities were crowded into small living spaces during the day. This highlighted the benefit of nearby green areas that were open to the public. In most cities the majority of the residents can reach at least one hectare of green urban area by walking a short distance. In a number of cities, however, less than half of the people have easy access to green urban spaces. This is the case in all the cities in Cyprus, Malta and Romania , and some big cities in Italy, France and Portugal, where less than half the residents have a green urban area within 400 metres of their home (Map 1.3). , The working

from home requirements and remote lessons also posed challenges for households without fast internet connections, which is more often the case in rural areas.

Map 1.3 Population with access to green urban areas of at least one hectare within 400 metres of walking, 2018

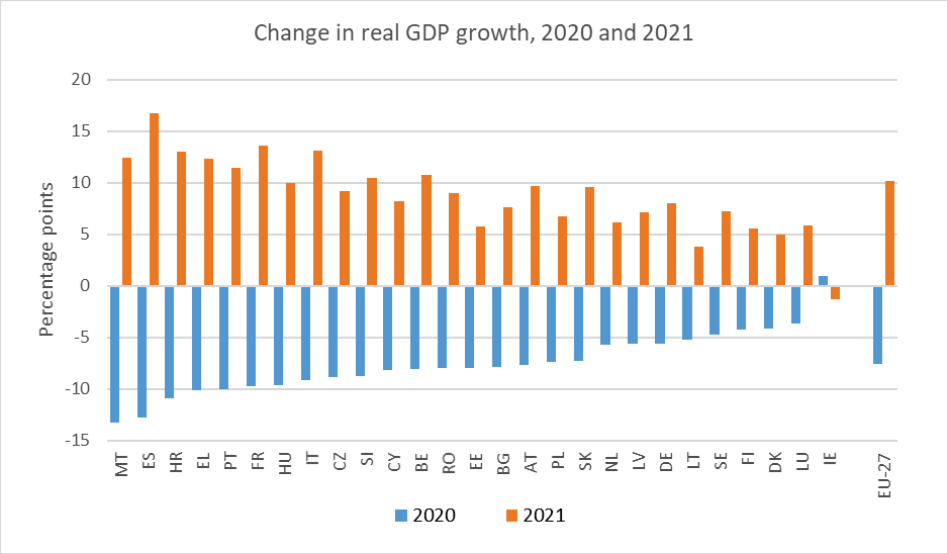


1.2.2 The biggest post-war recession

The COVID-19 pandemic triggered the deepest post-war recession in Europe. Real GDP growth averaged 2.1% a year between 2014 and 2019. In 2020, real GDP fell by 6.0%. All economic sectors were affected by the consequences of containment measures, the disruption of global supply chains, the sharp reduction in demand for goods and services, and the fall in tourism, business travel and recreation. Across Europe and the rest of the world, the crisis led to unprecedented policy responses to mitigate the effects of the shock and strengthen the recovery.

The economic impact of the COVID crisis varies widely across Member States. Between 2019 and 2020, there was a reduction in real GDP growth of 13 percentage points (pp) in Malta and Spain (GDP increasing by 5.5% in 2019 and falling by 7.8% in 2020 in the first and increasing by 2.0% in the second and falling by 10.8% in the second) while the reduction was less than 5 pp in Finland, Denmark and Luxemburg, and in Ireland, there was even a small increase (Figure 1.5). Economic activity rebounded in 2021, in particular in the Member States where it fell the most[8].

Figure 1.5: Change in real GDP growth relative to the previous year, 2020 and 2021



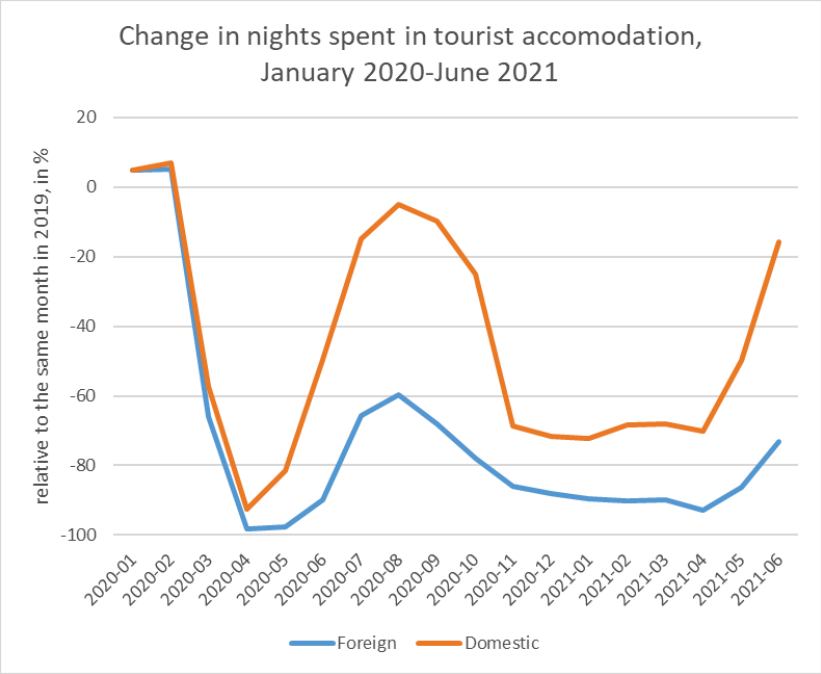
Source: EUROSTAT table nama_10_gdp and ECFIN Spring 2021 forecast

1.2.3 The tourist sector was most affected

Restrictions on movement within countries and limits on non-essential travel brought tourism to a standstill. The number of nights spent by tourists plummeted with the outbreak of the pandemic and the strict travel restrictions (Figure 1.6), falling by more than 90% compared to the same month in the previous year. The nights spent by domestic tourists recovered in the summer of 2020 but then fell again. The nights spent by international tourists remained extremely low throughout 2020 and the first half of 2021. Overall in 2020, nights spent dropped by 54% in relation to 2019, but those spent by international tourists fell by far more (70%) than those spent by domestic ones (39%).

Figure 1.6: Change in the number of nights spent in tourist accommodation, January 2020 to June 2021

[8] European Commission (2021), "European Economic Forecast Spring 2021", Directorate-General for Economic and Financial Affairs, Institutional Paper 149, : Publications Office of the European Union, Luxemburg.

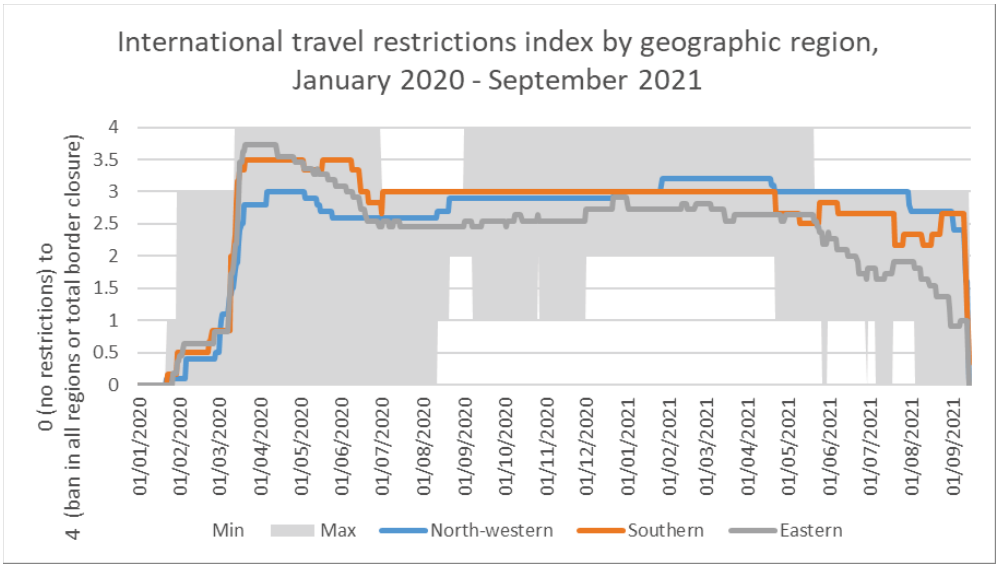


Source: EUROSTAT table TOUR_OCC_NIM

These reductions were primarily caused by the restrictions on international travel that were introduced after the start of the pandemic. By the summer of 2020, all Member States had instituted some restrictions and these mostly stayed in place until summer 2021 (Figure 1.7). The restrictions on internal movement were part of the response to the first wave of the pandemic, but were loosened in summer 2020. During the second and third waves, internal restrictions remained much laxer. This allowed domestic tourism to recover somewhat during the summer of 2020, but the number of nights spent by tourists in the winter and spring of 2021 remained much less than in 2019.

The restrictions on international travel also disproportionally affected border areas. People who usually crossed a national border for work, education, healthcare or other services were suddenly no longer able to do so. After the initial restrictions were put in place, while some borders made allowance for cross border commuting, many did not, which underlines the need for a better governance system for functional border areas.

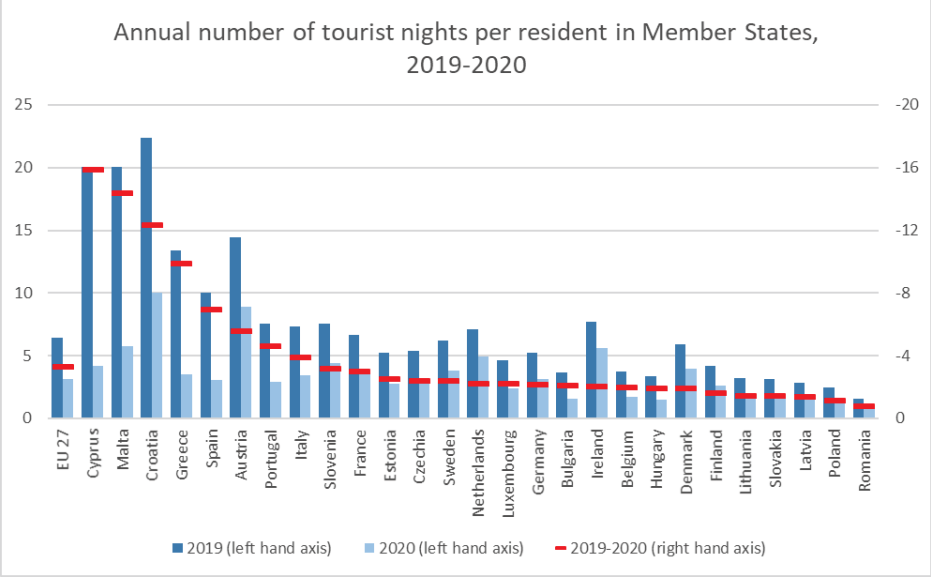
Figure 1.7 International travel restrictions index by geographic region, January 2020 – September 2021



Source: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government, University of Oxford. Unweighted averages of country indices.

The countries with the biggest reductions in the number of nights spent per resident were Cyprus, Malta, Croatia, Greece and Spain, with reductions of more than double the EU average (Figure 1.8). The reductions were much smaller in countries with generally relatively few tourist nights per resident.

Figure 1.8: Annual number of tourist nights per resident in Member States, 2019-2020



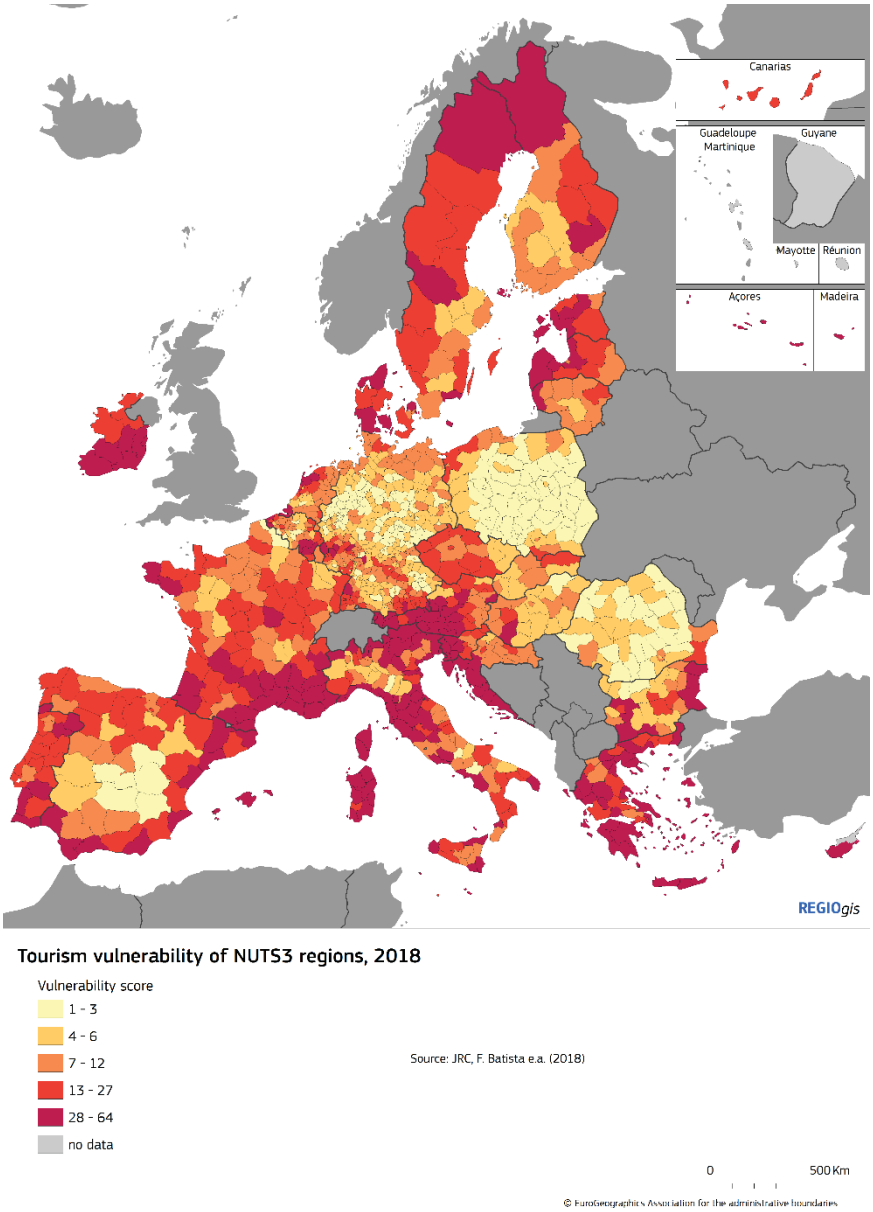
Source: EUROSTAT TOUR_OCC_NIM, REGIO calculations.

Some regions are particularly dependent on tourism, including many of the Mediterranean islands and some coastal regions, the Alpine regions, the Black Sea Coast, Algarve and the Canary Islands. Some capitals and large cities also attract many tourists, but they are less dependent on tourism than coastal or mountain destinations because of much

stronger and more diversified economies. To identify the regions most dependent on tourism, three indicators can be combined: nights spent per resident, seasonality of nights spent and the share of foreign tourists[9] (

Map 1.4). Regions scoring highly on all three indicators are likely to have been more affected by the reduction in travel and nights spent. For example, the Mediterranean coastal and island regions are likely to have been particularly heavily affected.

Map 1.4: Tourism vulnerability index, 2018, NUTS 3



9 Batista e Silva F, Marin-Herrera MA, Rosina, K, Barranco R, Freire S, Schiavina M (2018), "Analysing spatiotemporal patterns of tourism in Europe at high resolution with conventional and bit data sources". Tourism Management 68: 101-115. doi:10.1016/j.tourman.2018.02.020

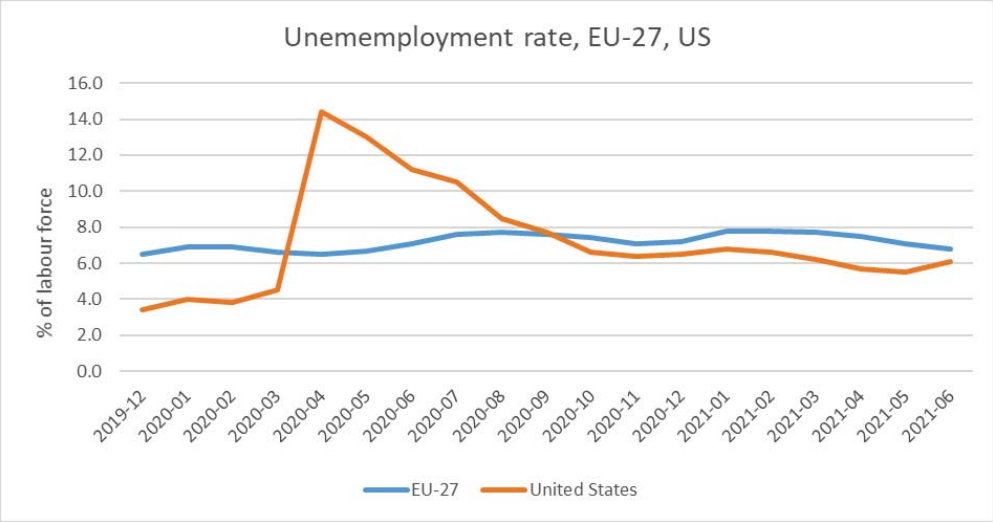
The tourism is not the only sector to have suffered from the economic downturn triggered by the pandemic. Contact-intensive services[10] were also severely affected. In the second quarter of 2020, activity in these sectors was 25% below pre-COVID-19 levels[11]. Other sectors were less affected but still experienced a sharp drop in activity, notably manufacturing (down by 19%) and construction (down by 15%). Services with significant scope for working remotely and with high-skilled workers, like ICT, banking and finance, contracted much less (by less than 10%) and these activities tended to rebound more quickly.

1.2.4 The impact on the EU labour market was muted

The pandemic's impact on the labour market was much more limited due to the many job retention schemes put in place shortly after the outbreak of the crisis. As a result, the economic slowdown did not lead to large increases in unemployment. The EU unemployment rate only went up by 0.5 pp between December 2019 and June 2021, from 6.6% to 7.1% with a peak at 7.7% in September 2020. By contrast, in the United States, which did not rely as much on job retention schemes, the unemployment rate doubled from 3% to 6% between December 2019 and June 2021, with a peak of 14% in April 2020 (Figure 1.9).

At the EU level, employment[12] fell by 3 million, or 1.5%, between 2019 and 2020. Southern EU lost the most employment (2.7%). The reduction in eastern EU was smaller (1.2%), while in north-western EU, it fell by least (0.9%). Employment started to recover in the second quarter of 2021 but has not yet reached its 2019 level.

Figure 1.9: Monthly unemployment rate in the EU and United States, 2019 and 2020



Source: EUROSTAT table une_rt_m

As reflected by the unemployment figures, the employment rate (of those aged 20-64) in the EU also fell by relatively little, by 0.7 pp between 2019 and 2020. The reduction was largest (1.4 pp) in the southern EU, followed by the north-western EU (0.6 pp) and t the eastern EU (0.2 pp).

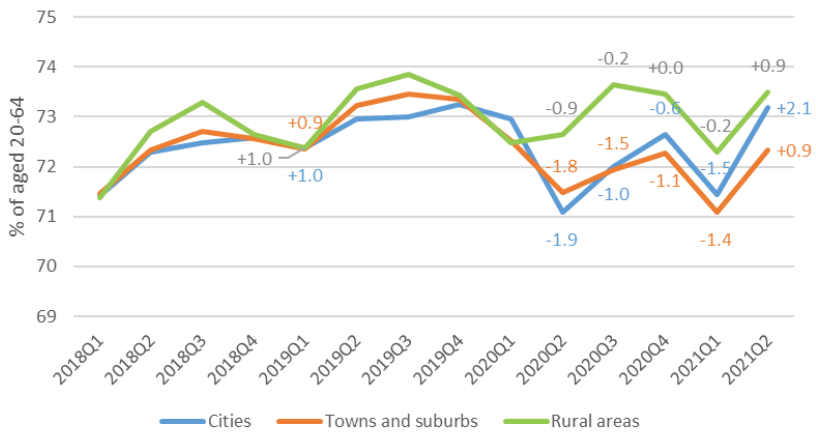
[10] Trade, transport and accommodation, and arts, entertainment and other service activities

[11] European Commission (2021), "The sectoral impact of the COVID-19 crisis", Technical Note for the Eurogroup.

[12] Source: Eurostat, National Accounts; domestic employment

Across the EU, the employment rate declined by most in towns and suburbs (1.1 pp) between 2019 and 2020, followed by cities (0.7 pp) and it barely fell at all in rural areas (by 0.3 pp). The quarterly figures show that the reduction was largest in cities in the second quarter, but it was then overtaken by the fall in towns and suburbs (Figure 1.10).

Figure 1.10: Quarterly employment rate by degree of urbanisation, 2018-2021



Source: Eurostat, LFS (non-seasonally adjusted) table lfsq_pgauws

Note: Labels show y-on-y change in pp.

1.2.5 Hours worked dropped substantially

Because of the pandemic, the number of hours worked declined significantly in the EU between 2019 and 2020, though the scale of the reduction depends on the source of the data used and the working time for which hours are measured. The Labour Force Survey (LFS), which measures weekly hours, indicates a reduction in the EU of 12%, whereas the national accounts data[13], which measures annual hours, shows a reduction of 6% (Figure 1.11). Both sources agree, however, that the biggest reductions occurred in Greece, Spain, Portugal and Italy. The LFS data also show that regions with large tourist economies were especially affected (Map 1.5). More developed regions were slightly less affected (with a reduction of 10% based on LFS data) than transition and less developed regions (a fall of 13% in each).

[13] 2020 data for 11 Member States is flagged as provisional.

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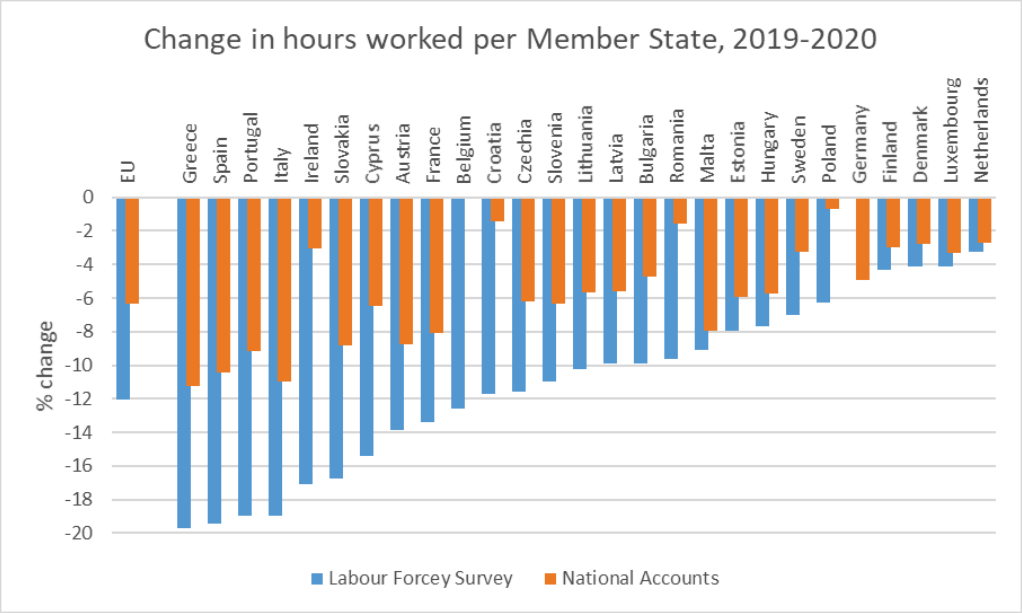
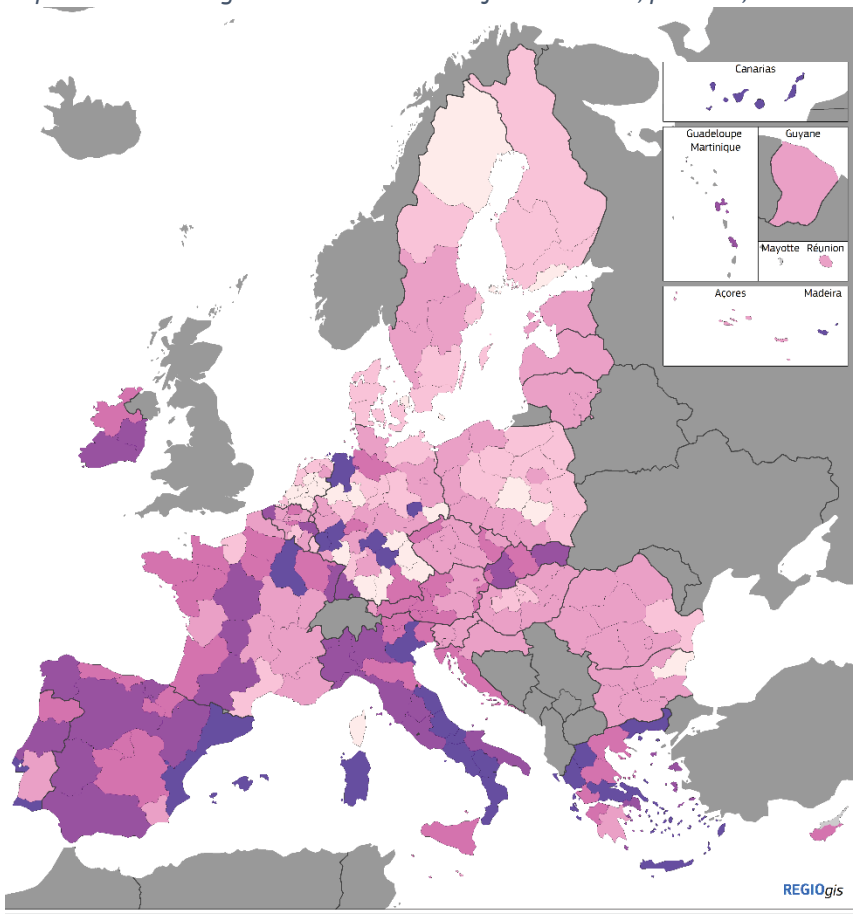
Figure 1.11 Change in hours worked in Member States, 2019-2020



Source: Eurostat LFS ad hoc extraction and table NAMA_10_A10_E

Map 1.5 Annual change in the actual number of hours worked, per week, 2020



Annual change in the actual number of hours worked, 2020

%
- < -20.0
- -20.0 - -17.0
- -17.0 - -13.3
- -13.3 - -6.5
- -6.5 - -3.0
- >= -3.0
- no data

EU-27 = -13.3
People aged 20-64 years.
Source: Eurostat Labour Force Survey

0 500 Km

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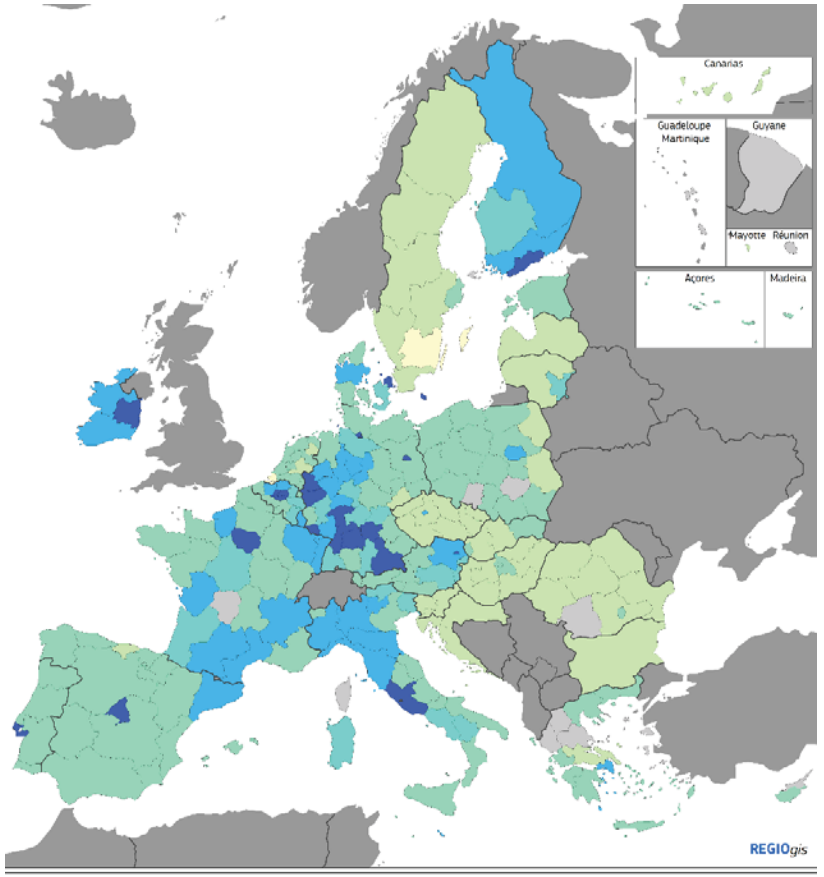
Map 1.6 Annual change in the share of people usually working from home, 2020



Annual change in the share of persons usually working from home, 2020

Percentage points
- < 0.0
- 0.0 - 2.5
- 2.5 - 6.9
- 6.9 - 8.0
- 8.0 - 12.0
- >= 12.0
- no data

EU-27 = 6.9
People in employment aged 20-64 years.
Source: Eurostat Labour Force Survey

0 500 Km

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The biggest reduction in hours worked over the period occurred in the accommodation and food services sector (by 52%) and the arts, entertainment and recreation sector (by 36%). The two most affected broad occupational groups were service and sales workers (which showed a fall of 27%) and elementary occupations (one of 23%).

1.2.6 A big shift to working from home

In 2019[14], 5.5% of the employed population in the EU usually worked from home. Because of the pandemic, and the requirement to work from home where possible, the proportion more than doubled to 12.4% in 2020. The capacity to work from home depends on the type of activity concerned. Some jobs can only be performed in person, as noted above, such as many jobs in healthcare, manufacturing and agriculture. Many of the regions with large cities saw big increases in the proportion of people working from home, reflecting the large share of economic activities which can be performed remotely (usually by high-skilled workers). In particular, the increases were over 15 pp in the Brussels, Helsinki, Dublin, Paris, Cologne and Vienna regions (Map 1.5). The distribution of critical[15] and 'teleworkable' jobs strongly depends on the degree of urbanisation. Rural areas tend to have a larger share of 'non-teleworkable' jobs than cities, towns and suburbs[16].

1.2.7 Regional impact is likely to be highly variable

Regional GDP data for 2020 is not yet available, which limits the extent to which the impact of the COVID pandemic on the economies of the EU regions can be assessed. A modelling exercise[17] using national data and the RHOMOLO regional model, however, gives an indication of the potential regional impact. It shows a particularly severe impact on southern European regions and France, and less effect on Nordic and eastern regions (Map 1.7). The model suggests that in Spain, Italy, France, and Greece, some regions are likely to experience a particularly sharp reduction in GDP. This is especially so for those with a large share of value-added in wholesale and retail trade, transport and accommodation, i.e. in the sectors where tourism is important, which is line with the actual changes in hours worked in 2020 indicated above.

[14] Source: Eurostat, LFS ad-hoc module 2019

[15] Critical jobs can be defined as all those occupations that need to be performed even during a pandemic in order to keep citizens heathy, safe and fed.

[16] Employment and Social Developments in Europe 2021.

[17] Based on national figures for 2020 on employment, output in the various NACE sectors, exports and the rise in uncertainty assumed to be reflected in an increase in interest rates, Sakkas et al. (2021) used the RHOMOLO model to estimate the impact of the crisis on NUTS-2 regions. The magnitude of the shocks are calibrated so that the ranking of countries in terms of output loss is, so far as possible, in line with the latest real GDP growth figures for 2020 published in the Spring 2021 European Economy Forecast .

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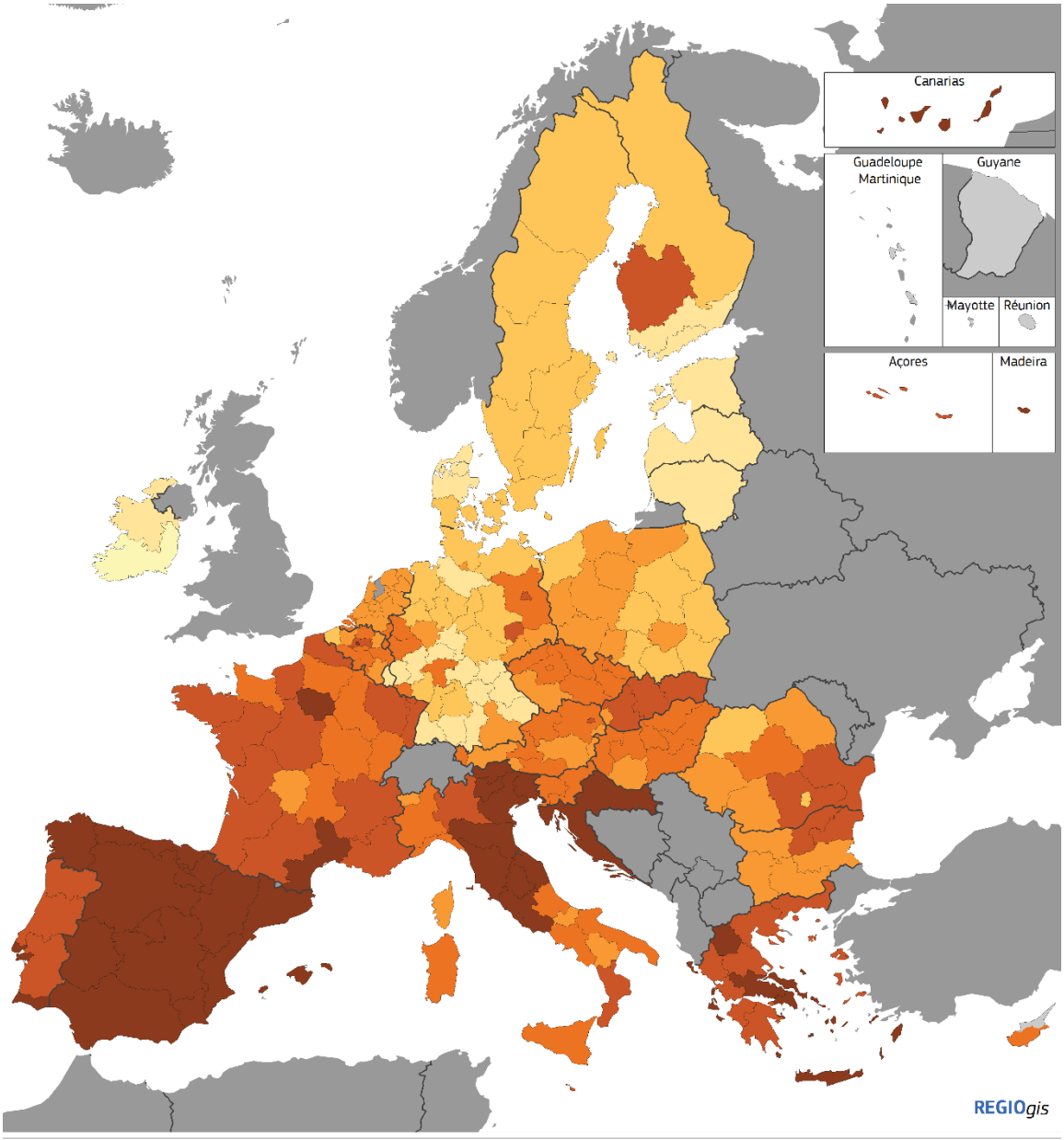
Map 1.7: Simulated regional GDP impact of the crisis in 2020



Simulated regional GDP impact of the crisis in 2020

% change with respect to baseline

-13.8 - -8	-4 - -3
-8 - -6	-3 - 0
-6 - -5	0 - 1.6
-5 - -4	no data

Source: JRC and RHOMOLO

0 500 Km

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COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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CHAPTER 2. A SMARTER EUROPE – PART 1

- After the financial and economic crisis years and its aftermath, the EU economy is growing again, with growth being particularly high in low-income countries.
- After a long period of convergence, since the crisis in 2008 regional disparities in GDP per head have stopped shrinking. Regional disparities in employment and unemployment rates increased dramatically after the economic crisis. Since 2013, they have started shrinking again, but remain significantly greater than in 2007.
- GDP per head in the less developed regions is converging towards the EU average through both faster productivity growth and increased employment. This trend is primarily driven by developments in regions in the eastern Member States whereas many less developed regions in the southern Member States are failing to catch up and experiencing decline and divergence.
- The last two decades have witnessed a modernisation of the agricultural sector, evidenced by a long-term and ongoing increase in productivity and decrease in employment. These developments have been particularly pronounced in the less developed regions, which have experienced a sectoral restructuring of the economy.
- Transition regions, with a GDP per head between 75% and 100% of the EU average, seem stuck in a 'development trap.' Between 2001 and 2019, their growth in GDP per head was far below the EU average, and their productivity growth and employment creation was less than in other regions. Their manufacturing sectors are smaller than those in regions with a lower or higher GDP per head and their innovation and education systems and institutional quality are not strong enough to be competitive at the global level.
- Innovation in the EU remains highly concentrated in capital and other metropolitan regions. In north-western EU countries, good regional connections, high digital readiness, a skilled labour force and an attractive business environment have enabled surrounding regions to benefit from proximity to highly innovative ones. In southern and eastern EU countries, the most innovative regions are less strong and, accordingly, neighbouring regions reap little benefit. These patterns could lead to a widening research and innovation divide between EU regions.

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CHAPTER 2. A SMARTER EUROPE – PART 1

Regional economic convergence[1] has stopped in the EU and divergence could become a threat to economic progress (Iammarino et. al., 2017) at a time when globalisation poses new challenges to economic cohesion. While the evidence suggests that the EU economy as a whole has benefited, and continues to benefit, from globalisation, these benefits are not automatically and evenly transmitted to all regions.

This chapter examines recent trends in economic cohesion in regions and cities across the EU, as reflected in GDP per head and in the underlying developments in productivity and employment. It assesses the risk of regions falling into a 'development trap' and discusses the factors underlying regional competitiveness, including entrepreneurship, digitalisation and innovation. It also presents an aggregate indicator, the Regional Competitiveness Index, intended to summarise the different dimensions of competitiveness.

The main concern throughout the chapter is to highlight the performance of the less developed regions against the more developed ones and of rural areas compared to cities.

2.1 RECENT TRENDS IN CONVERGENCE AND DIVERGENCE BETWEEN EU MEMBER STATES AND REGIONS

In 2019, over one in four people in the EU (29%) lived in a NUTS 2 region with GDP per head below 75% of the EU average in PPS terms[2], most of them in eastern Member States[3], Greece, Portugal, Spain, and southern Italy as well as in the outermost regions [4] (Map 2-1). In Bulgaria, GDP per head was below 50% of the EU average in all regions, except in Yugozapaden, the capital city region.

Over the 2001-2019 period, GDP per head in real terms increased in the vast majority of EU regions (Map 2-2), albeit at a modest rate in most cases. Growth was particularly high in the eastern Member States and Ireland. In most regions in Greece, however, GDP per head fell over this period, as it did in Italy, both in many of the more developed regions in the north and in many of the less developed in the south. At the same time, growth was very low in transition regions in the north of France.

Between 2001 and 2008, nearly all regions experienced growth in GDP per head (Map 2-3). Overall, growth was above average in both the less developed and the transition regions, with rates of over 5% a year in many of those in eastern Member States. This is in line with mainstream economic growth theories, which predict that growth will tend to be higher the lower the initial level of GDP per head. Most of these regions are in less developed and moderately developed Member States[5], where for the most part growth was faster than the EU average (Figure 2-1). In Romania and Bulgaria, where the growth rate was particularly high, the catching

[1] In this report 'economic convergence' primarily refers to a decrease in regional disparities in gross domestic product per capita. However, the chapter also discusses trends in disparities in related concepts such as productivity and employment.
[2] GDP per head in PPS (Purchasing Power Standards) terms is the total value of goods and services produced per inhabitant adjusted for differences in in price levels.
[3] Eastern Member States are those in central and eastern Europe, which have joined the EU since 2004.
[4] The EU includes nine Outermost Regions: Guadeloupe, La Réunion, Mayotte, Guyane, Martinique, Saint-Martin (France), Madeira and Açores (Portugal) and Canarias (Spain).
[5] See the Lexicon section for the list of less developed and moderately developed Member States.

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up was not uniform across the country but was driven by the capital city region. Regions in southern Italy, however, did not follow this pattern of catching-up. They already experienced negative growth in the 2000s even though their GDP per head was well below the EU average.

The global financial crisis of 2007-2008 led to GDP per head in the EU declining between 2009 and 2013. Around 60% of the EU population lived in regions with a declining GDP per head (Map 2-3, Figure 2-2). The regions hit hardest were mainly in the southern EU countries, though also in Romania, Ireland and Finland. In most Greek regions, the reduction in GDP per head averaged over 3% a year. The crisis led to many of the less developed and transition regions growing more slowly (or shrinking faster) than the EU average during this period, so reversing the tendency towards convergence. The process of convergence was, therefore, brought to an end and disparities began to widen again. Most regions in Poland and some in Bulgaria and Romania were notable exceptions.

The 2014-2019 period shows a clear recovery from the Great Recession (Map 2-3, Figure 2-3). Almost all regions experienced growth in GDP per head, though at a lower rate than in the pre-crisis period. High growth rates were restored in most eastern regions, so contributing again to convergence. By contrast, growth in many north-western regions remained below pre-crisis rates, Ireland being the main exception. In many regions in the hard-hit southern Member States, especially in Portugal and Spain, growth rates recovered, but in Greece and many regions in Italy, growth remained low.

Overall, more than a quarter of the EU population live in a region where by 2019 real GDP per head had still not returned to pre-crisis levels. This includes the entire population of Greece and Cyprus, 80% of Italians and a third of Spaniards, but also 75% of the Finnish population and over a third of Austrians. In most of the eastern Member States, GDP per head had returned to pre-crisis levels in all or nearly all regions. However, in Romania and Croatia 40% and 25% of the population, respectively, live in regions where this is not the case.

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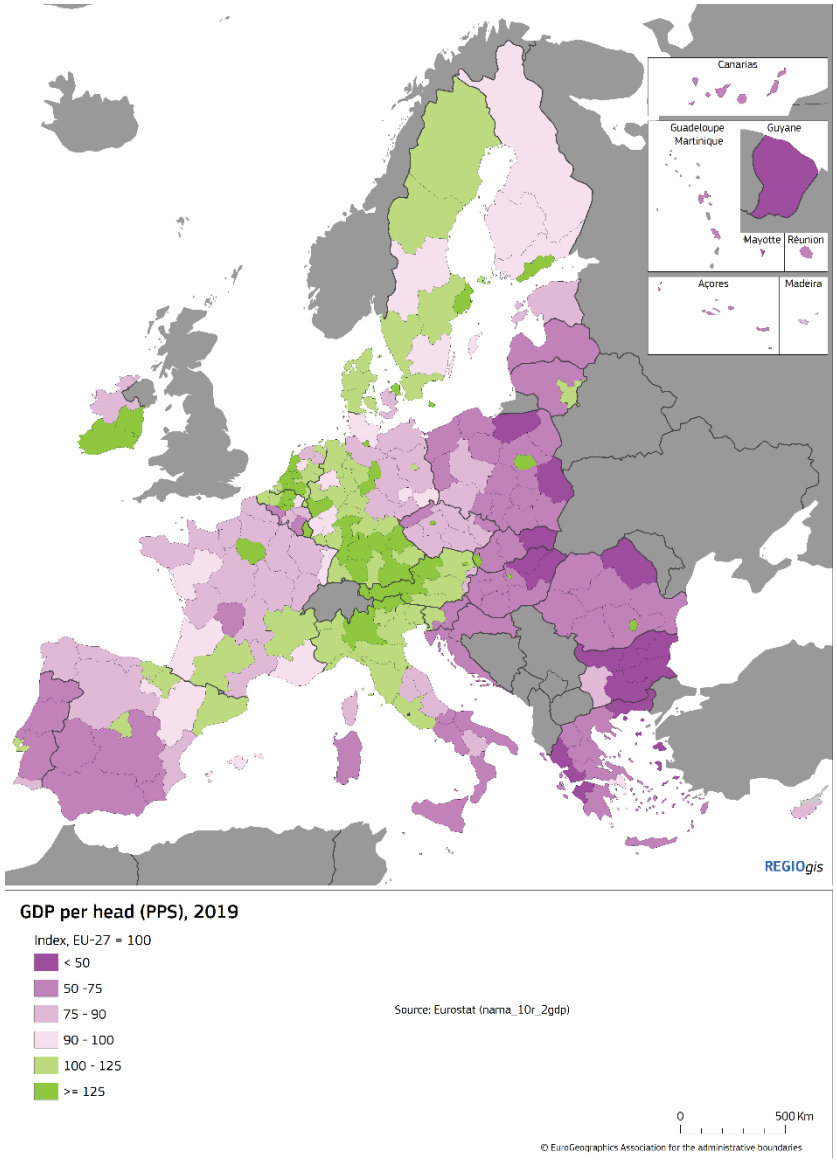
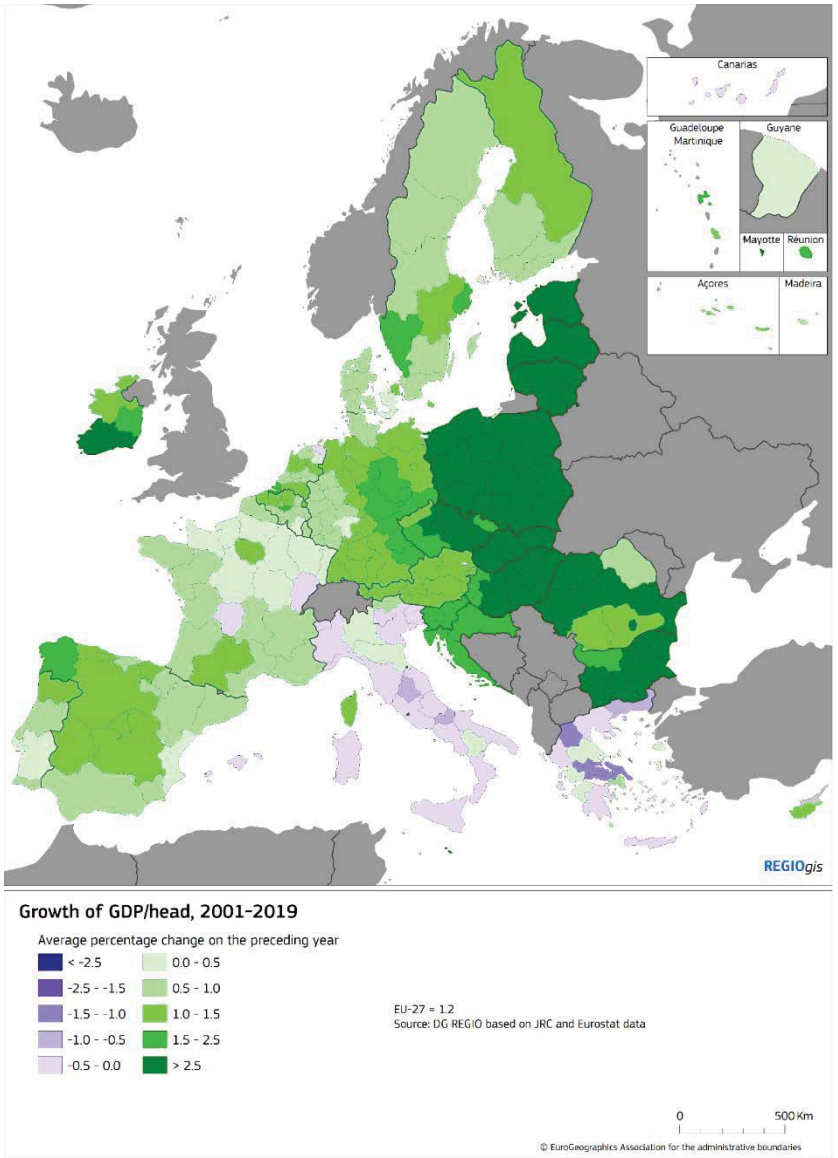
Map 2-1 GDP per head (PPS), 2019



Map 2-2 Growth of GDP per head, 2001-2019



Map 2-3 Growth of GDP per head in real terms between 2001-2019, main sub-periods

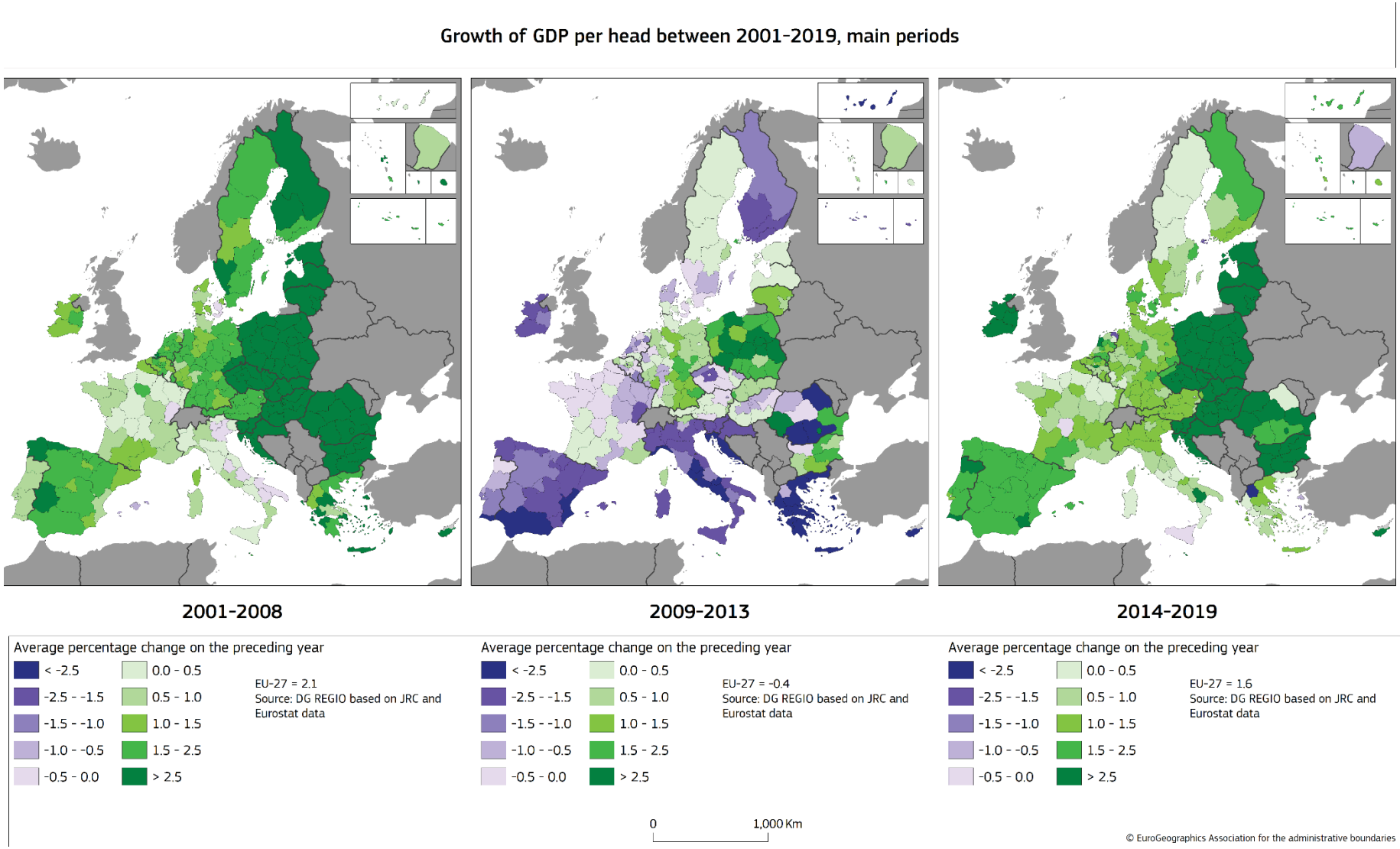
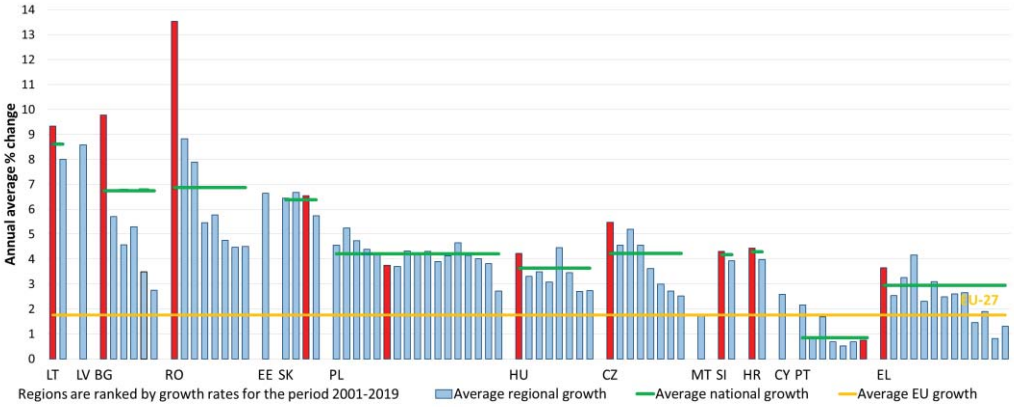
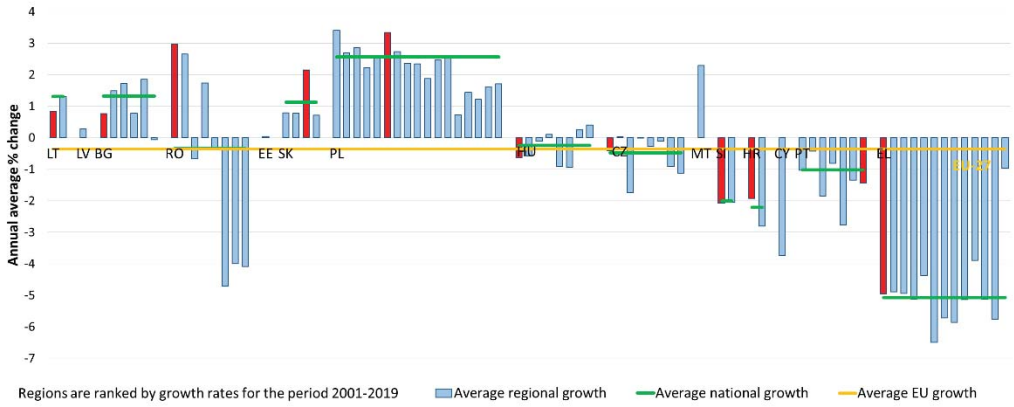


Figure 2-1: Growth rates of GDP per head in regions in less developed and moderately developed Member States, 2001-2008



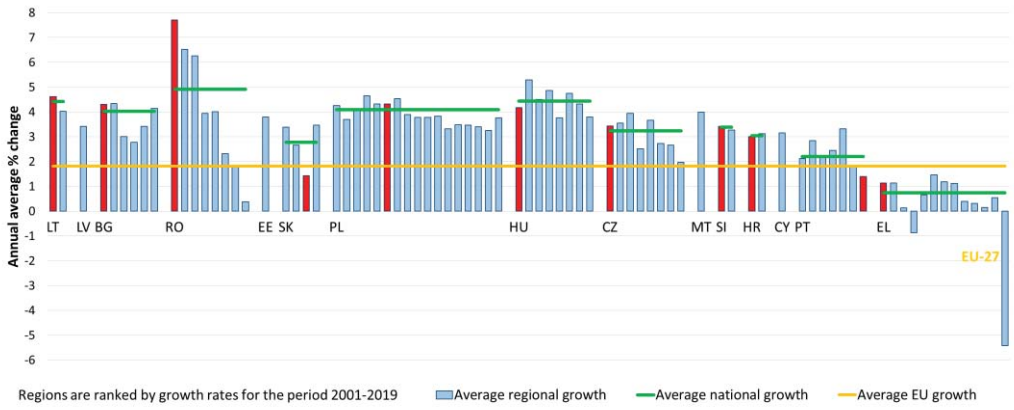
Note: Regions are ranked by the growth rate of GDP per head over the period 2001-2019; Capital city regions are indicated in red
Source: ARDECO and Eurostat [nama_10r_2gdp], DG REGIO calculations

Figure 2-2: Growth rates of GDP per head in regions in less developed and moderately developed Member States, 2009-2013



Note: Regions are ranked by the growth rate of GDP per head over the period 2001-2019; Capital city regions are indicated in red.
Source: ARDECO and Eurostat, DG REGIO calculations

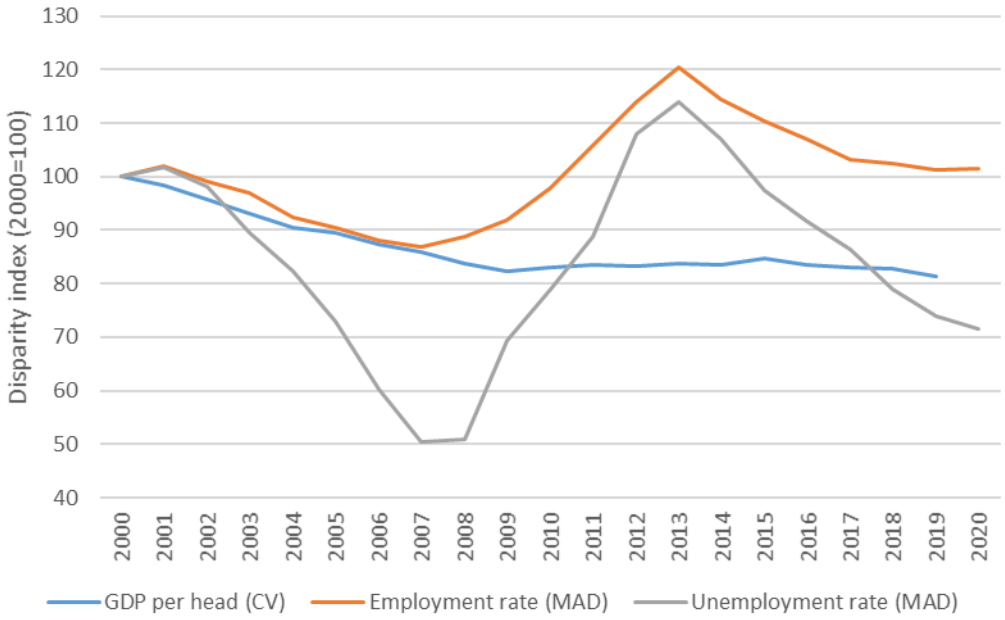
Figure 2-3: Growth rates of GDP per head in regions in less developed and moderately developed Member States, 2014-2019



Note: Regions are ranked by the growth rate of GDP per head over the period 2001-2019; Capital city regions are indicated in red.
Source: ARDECO and Eurostat, DG REGIO calculations

Prior to the 2007-2008 crisis, disparities in GDP per head in the EU were shrinking[6], mainly because of regions with the lowest levels growing faster than average (Figure 2-4). However, in the years immediately following the crisis, regional disparities widened slightly. There are signs that the long-term process of regional convergence, which was interrupted by the crisis has resumed, although at a very slow pace.

Figure 2-4: Regional disparities between NUTS-2 regions in the EU, 2000-2020



[6] The coefficient of variation, weighted by total regional population, fell by 12% during 2001-2008

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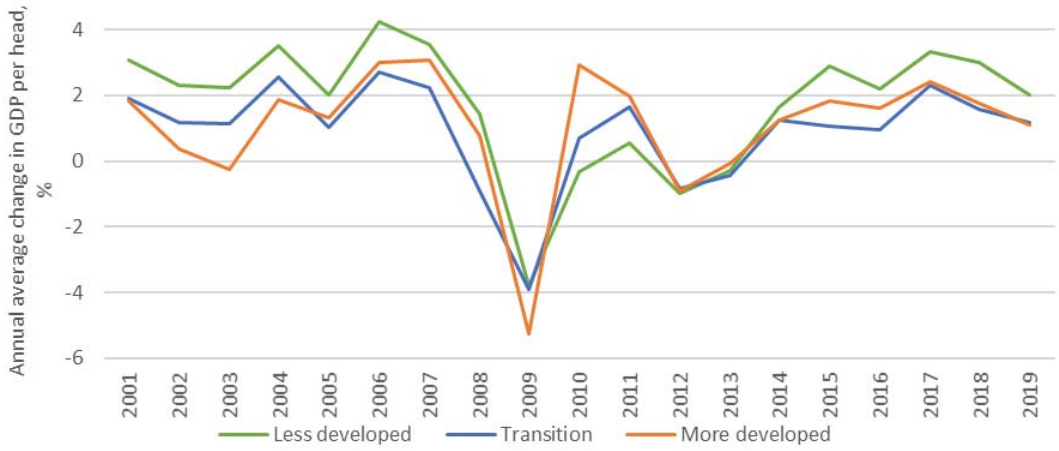
Note: Disparities are measured by the coefficient of variation (CV) and the mean absolute deviation (MAD). Both are weighted by the population in each region. The analysis is based on the NUTS2 level but regions which are part of the same metropolitan area are combined.
Source: Eurostat [nama_10r_2gdp, reg_lmk], DG REGIO calculations.

Regional disparities in employment and unemployment rates[7] also narrowed from 2000 up to the financial crisis when they widened to reach a new peak in 2013. After then, they began narrowing again, but, in 2020, the disparities in both were wider than in 2008. Disparities in the employment rate remain at much the same level as in 2000.

The economic convergence of regions over the period 2001-2019, as noted above, was mainly driven by the catching up of many of the less developed ones, their GDP per head growing faster than elsewhere, except in 2010 and 2011 immediately following the global financial crisis (Figure 2-5). The average picture, however, hides differing trends among less developed regions. While there has been strong growth and significant catching up in those in eastern Europe, many less developed regions in southern Europe have experienced sluggish or negative growth and their GDP per head is diverging away from the EU average (Section 2.3 below examines on these trends further).

The transition regions, however, do not follow the same pattern. From 2005 onwards, growth in these regions was below the EU average, except in 2009. As a result, GDP per head, in PPS terms, diverged from the EU average instead of converging (Figure 2-6a).

Figure 2-5: Growth of GDP per head in real terms by level of development, 2001-2019



Source: ARDECO and Eurostat, ARDECO, DG REGIO calculations

Predominantly rural regions have a GDP per head, in PPS terms, around 70% of the EU average (Figure 2-6b). Over the period 2001-2019 rural regions close to cities showed convergence to the EU average. This did, however, not hold for remote rural regions where GDP per head slightly decreased relative to the EU. Remote intermediate regions also diverged from the EU average over this period.

[7] As measured by the mean absolute deviation weighted by total regional population.

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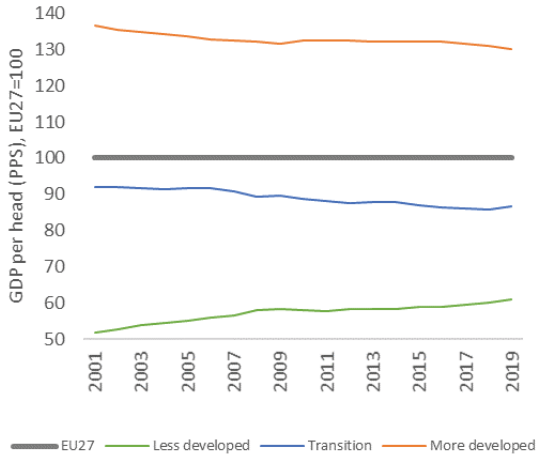
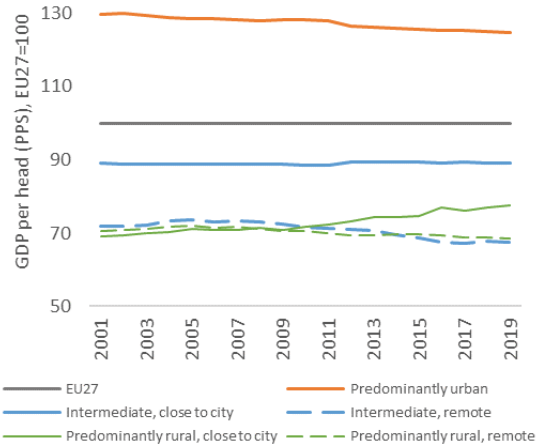
Figure 2-6: Changes in GDP per head (PPS), 2000-2019

(a) By level of development



(b) By degree of urbanisation and remoteness



Source: Eurostat [nama_10r_2gdp], ARDECO, DG REGIO calculations

The growing interdependence of the world's economies has had a highly differentiated impact on EU regions[8]. While some have been well positioned to take advantage of the new opportunities it offers, others have been hit by job losses, stagnating wages and shrinking market shares as a result of low-cost competitors moving into more technologically advanced sectors (see also Section 2.4 below).

[8] European Commission (2017)

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EU outermost regions

The EU includes nine outermost regions, geographically remote from the continent in the Caribbean basin, the Macaronesia area and the Indian Ocean. They are Canarias (ES), Guadeloupe, Guyane, La Réunion, Martinique, Mayotte, Saint-Martin (FR), Madeira and Açores (PT). They are governed by the provisions of the Treaties and form an integral part of the Union.

Around five million people live in the outermost regions, some of which have significant population growth due to inward migration. The natural growth rate in population is also relatively high as in most of these regions the population is much younger than in the mainland EU.

GDP per head in the regions is below the EU average (Table 2-1). In Mayotte, with a population of around 270 000 in 2019, it is only around a third of the EU average, meaning that the region lowest GDP per head in the EU. GDP per head is also low in Guyane (45% of the EU average) and Reunion (68%). The low GDP per head in these three regions is primarily linked to low employment rates and, in the case of Guyane and Mayotte, also to low productivity per worker. Productivity is also low in Madeira and Açores. The share of working-age in total population in the outermost regions is in most cases closer to the EU average, though in Mayotte, reflecting the large number of young people, it is well below and in Canarias, Madeira and Açores well above.

Table 2-1: GDP per head and its components in outermost regions, 2019

	GDP per head (PPS), 2019	Productivity (GDP per worker), 2019	Employment rate (% of total population aged 20-64), 2019	Working age population (% aged 20-64 in total population), 2019
EU-27	**31,278**	**72,057**	**73.1**	**59.4**
Canarias	22,928	57,071	61.4	65.4
Guadeloupe[(i)]	22,215	72,083	55.4	55.6
Martinique	23,042	64,244	63.7	56.3
Guyane	14,188	53,329	50.9	52.3
La Réunion	21,123	70,610	52.1	57.4
Mayotte (2019)	9,016	47,781	43.3	43.6
Região Autónoma dos Açores	21,911	48,473	71.2	63.5
Região Autónoma da Madeira	23,768	50,542	74.1	63.5

Source: Eurostat [nama_10r_2gdp, lfst_r_lfe2emprt_custom_1270645], DG REGIO calculations.
[(i)] The outermost region of Saint-Martin is included in the NUTS2 region of Guadeloupe.

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Economic growth and local economies: a spatial analysis of regional resilience in the EU

A recent study (Annoni et al., 2019) focuses on the crisis and post-crisis years, 2008–2015) and examines the factors helping regions to recover from the Great Recession, the main aim being to identify the characteristics of regions that showed economic resilience and any potential spill-over effects.

Regions in the EU27 plus the UK are classified into two regimes, based on their initial GDP per head in 2008: a north-western group of relatively high-income regions and a group of southern and eastern lower income regions. The main questions analysed are:

1. What are the factors associated with a region's capacity to cope with economic adversity and maintain economic well-being?
2. Are the determinants of economic growth and resilience the same across regions at different levels of economic development (in terms of GDP per head)?

The main part of the analysis is based on an economic growth model where regional growth depends on growth in neighbouring regions and a set of initial endowments, from classical ones - initial level of GDP per head, population growth, human capital and investment - to more complex components of regional competitiveness - quality of government, business sophistication, technological readiness and innovation. The model also takes account of the geographical proximity of regions when assessing their economic development and detects spatial spill-over effects when present, including cross-border (LeSage and Fischer, 2008). Based on this model, the analysis identifies which of these factors has contributed to economic growth in the regions and the size of the effect. A more in-depth discussion of the theoretical framework and assumptions underlying the analysis is provided in Annoni et al. (2019). The main findings, summarised in Table 2-2, are as follows.

Spatial effects are found to be important in all regions. Regions benefit from being surrounded by high-growth ones in both the north-western and south-eastern regimes. Human capital is an important factor of development in both, with basic education being particularly relevant: having large shares of low-educated people appears to be a more important impediment to growth than having smaller shares of high-educated people.

In the north-western regime, the quality of institutions is an essential determinant of growth, which accords with recent findings in the literature that highlight good institutions as a key growth factor, especially at more advanced stages of development (Annoni and Catalina-Rubianes, 2016; Pike et al., 2017). In the north-western regime of the EU (plus the UK), regions were more resilient if they had higher public and private investment. Results also indicate that high investment levels induce significant positive spill-over effects, suggesting that larger shares of investment in a region have positive effects on the growth rate of neighbouring regions.

A business environment with high value-added activities is also a key element of regional resilience.

In the southern and eastern regime, the absorption of technology is important for growth and has positive spill-over effects on neighbouring regions as well. Indeed, spill-over effects are more important generally in southern and eastern regions than in north-western regions, where such effects were possibly significant in earlier periods.

Table 2-2: Summary of direct and spill-over effects

	North-western regions		Southern and eastern regions	
	Direct	**Spill-over**	**Direct**	**Spill-over**
GDP growth	Not applicable		Not applicable	
Initial GDP per head				
Public and private investment				
Population growth				
Quality of institutions				
Lower secondary education				
Higher education and training				
Technological readiness				
Business sophistication				

Note: Green shades indicate positive impact; red shades indicate negative impact (the darker the colour, the more significant the estimated effect).

2.2 PRODUCTIVITY IN LESS DEVELOPED MEMBER STATES IS CATCHING-UP

2.2.1 Employment in agriculture and industry is shrinking while productivity is increasing

Regions at different levels of development tend to have different economic structures. Less developed regions tend to have relatively large shares of employment in agriculture and industry (Table 2-3). In 2018, over 12% employment in these regions was in agriculture, three times more than in transition regions and 8 times more than in more developed ones. Around 21% of employment was in industry, 6 percentage points (pp) more than in transition and more developed regions. Transition and more developed regions are more comparable in terms of their employment shares, with more employed in finance and insurance and public administration.

The sectoral composition of gross value-added (GVA) follows the same general pattern as employment, but the differences between regions at different levels of development tend to be less pronounced. Notably, despite the large work force in agriculture in less developed regions, GVA from agriculture is modest, implying low productivity.

Employment in agriculture fell between 2001 and 2018, especially in the less developed regions (by over 3% a year), reflecting their economic restructuring and agricultural modernisation. The latter led to a substantial increase in productivity in the sector and an increase in GVA. Given the large share of employment in agriculture in these regions, this process is likely to continue. The same pattern is observed in the transition and more developed regions, but the reduction in employment and growth in GVA were less than half that in less developed regions.

Employment in industry also declined in each of the three types of region, though much less so than in agriculture. Despite the loss of labour, GVA increased substantially, as did productivity, especially in the less developed regions. The EU single market has created more potential for specialisation in higher value-added sectors, enabling less developed and some transition regions to maintain a larger share of employment in industry, because they have an attractive balance between labour costs, productivity and accessibility.

The construction industry showed little growth over the 2001-2018 period and even contracted slightly in transition regions. By contrast, employment and GVA in services increased in all regional groups over the period, particularly in financial activities, especially in less developed regions.

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Table 2-3: Employment and GVA by NACE sector and category of region, % shares in 2018 and changes, 2001-2018

	Employment				GVA			
	Less Developed	Transition	More Developed	EU-27	Less Developed	Transition	More Developed	EU-27
Share in 2018 (%)								
A: Agriculture, forestry and fishing	12.4	3.9	1.6	4.8	4.7	2.5	0.9	1.7
B-E: Industry (except construction)	20.6	14.8	14.8	16.2	22.5	18.8	20.8	20.6
F: Construction	7.0	6.8	5.7	6.3	5.9	6.0	4.6	5.1
G-J: Wholesale and retail trade; et al.	26.2	27.1	28.2	27.4	24.5	21.7	24.8	24.1
K-N: Financial and insurance activities; et al	9.0	15.0	19.4	15.9	19.5	24.7	28.6	26.6
O-U: Public administration; et al.	24.7	32.4	30.3	29.4	23.0	26.3	20.3	22.0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Average % change on the preceding year, 2001-2018								
A: Agriculture, forestry and fishing	-3.4	-1.5	-1.3	-2.7	0.9	0.4	0.2	0.5
B-E: Industry (except construction)	-0.4	-0.6	-0.7	-0.6	2.2	1.2	1.3	1.4
F: Construction	0.5	-0.4	0.0	0.0	0.0	-0.6	-0.1	-0.2
G-J: Wholesale and retail trade; et al.	1.2	1.0	0.9	1.0	1.3	0.8	1.5	1.4
K-N: Financial and insurance activities; et al	2.5	2.0	2.1	2.1	2.3	1.9	1.9	1.9
O-U: Public administration; et al.	0.7	0.7	1.2	1.0	1.6	1.6	1.6	1.6
Total	**0.0**	**0.6**	**0.8**	**0.6**	**1.6**	**1.2**	**1.5**	**1.5**

Green bars indicate positive changes, red bars indicate negative changes.

Source: Eurostat [nama_10r_3empers], ARDECO, Cambridge Econometrics, AMECO, DG REGIO calculations

2.2.1 Productivity is the main factor underlying growth in GDP per head

Over the 2001-2019 period, GDP per head increased in the vast majority of EU regions (Map 2-4 and Table 2-2). The increase was largely associated with productivity growth[9], and to a lesser extent with employment growth. Working-age population as a share of the total decreased slightly in the EU and in most regions over this period. Many less developed regions, especially those located in the eastern Member States, had above average productivity and employment growth, offset only slightly by a decline in the share of working-age population, so that growth of GDP per head growth was above the EU average. This, however, masks the fact that in a number of these regions, mainly in Greece and Italy, GDP per head fell over this period, with productivity falling and the employment rate declining or increasing relatively little, combined with a shrinking share of working age population. In most of the EU outermost regions GDP per head remained at the same level or decreased.

From 2001 to 2008, GDP per head in the EU grew by 1.8% a year in real terms, with productivity growing by 1.2% a year and an increase in the employment rate adding another 0.4% a year (Table 2-4). In many less developed regions, where GDP growth was substantially higher than the EU average, productivity growth was also the main component of growth in GDP per head, and even more so than in the EU as a whole, while the employment rate remained unchanged.

Between 2009 and 2013, GDP per head in the EU declined by 0.4% a year. Employment also declined (by 0.5% a year) as both the employment rate and the share of the working-age population fell, while productivity continued to increase, though at a slower rate. This pattern of change is mirrored in each group of regions, but it is more pronounced in the less developed regions and less pronounced in the more developed ones. Accordingly, the less developed regions, as a group, experienced the sharpest decline in GDP per head, but also in the employment rate.

Decomposing growth in GDP per head

Growth in GDP per head can be broken down into three main components: changes in productivity (GDP per person employed), changes in the employment rate (employment relative to population of working age) and changes in the share of working age population in the total. Accordingly, the following identity holds:

$$\frac{GDP}{Total\ population} = \frac{GDP}{Employment} \times \frac{Employment}{Working-age\ population} \times \frac{Working-age\ population}{Total\ population}$$

The same identity can be expressed in terms of changes: The change in GDP per head is the sum of the changes in productivity, in the employment rate and in the share of working age population.

[9] Note that this productivity growth, as being measured by GDP per person employed, does not reflect the decrease in the average hours worked per person employed during this period.

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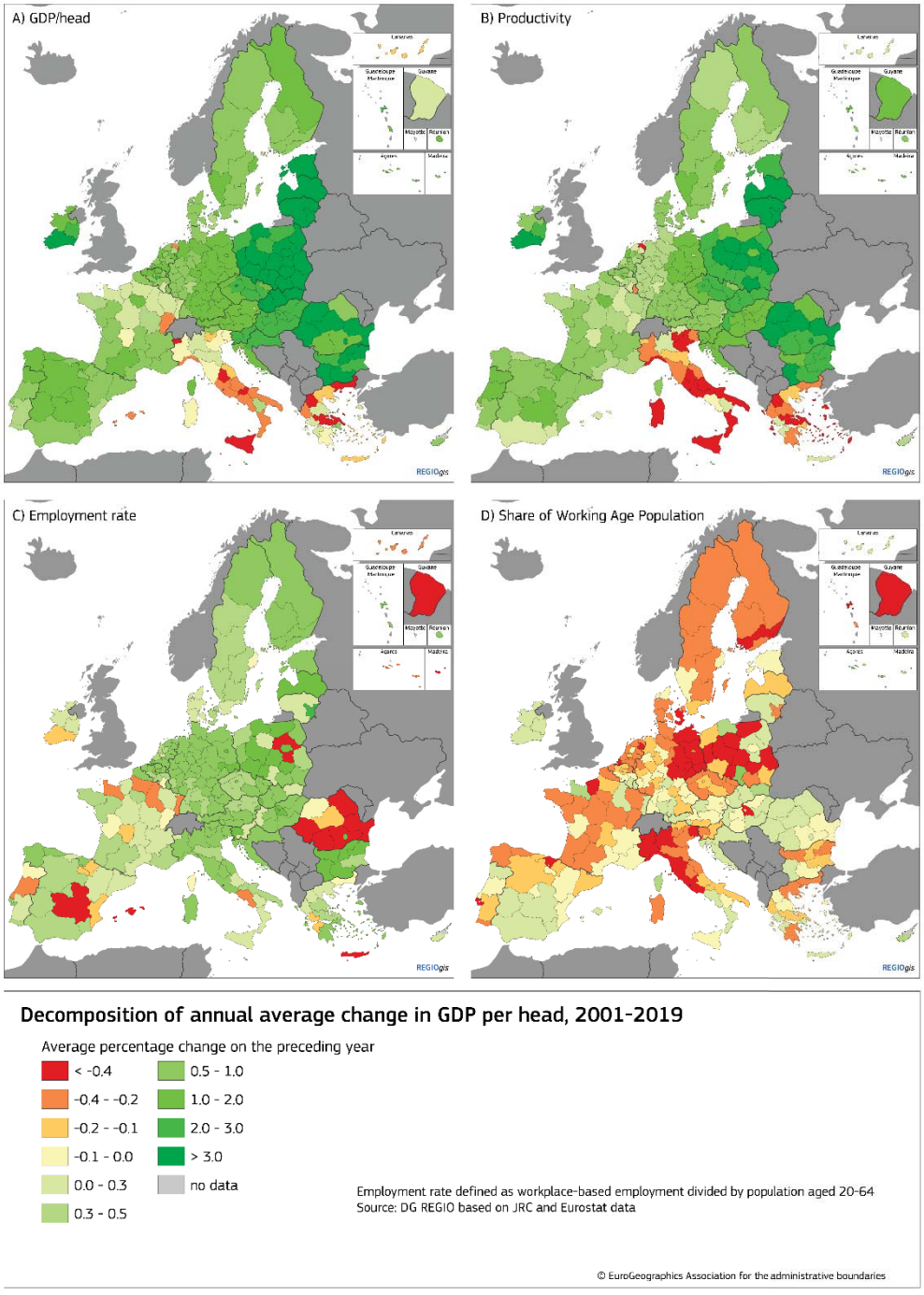
Map 2-4: Growth of GDP per head, productivity, the employment rate and working-age population, 2001-2019



Between 2014 and 2019, growth of GDP per head resumed in every regional group. Unlike in the period before the financial crisis, however, growth was strongly associated with an increase

in the employment rate, which more than offset a reduction in the share of working-age population, while labour productivity grew more slowly than in the pre-crisis period. Again, this pattern of change was more pronounced in the less developed regions. On the other hand, recovery was more subdued in the transition regions, with GDP per head growth being only slightly more than half that in less developed regions, much the same as in the pre-crisis period.

Table 2-4: Decomposition of annual average change in GDP per head, 2001-2019 and sub-periods

Average % change on the preceding year	GDP/head	Productivity	Employment rate*	Share of working-age population
	2001-2019			
EU-27	**1.22**	**0.88**	**0.50**	**-0.17**
Less developed regions	1.69	1.53	0.21	-0.05
Transition regions	0.90	0.62	0.49	-0.22
More developed regions	1.06	0.66	0.61	-0.21
	2001-2008			
EU-27	**1.76**	**1.16**	**0.43**	**0.15**
Less developed regions	2.79	2.26	0.00	0.52
Transition regions	1.47	0.81	0.44	0.22
More developed regions	1.49	0.93	0.67	-0.12
	2009-2013			
EU-27	**-0.36**	**0.50**	**-0.53**	**-0.33**
Less developed regions	-0.98	0.46	-1.23	-0.21
Transition regions	-0.59	0.47	-0.65	-0.41
More developed regions	-0.31	0.21	-0.17	-0.36
	2014-2019			
EU-27	**1.82**	**0.81**	**1.46**	**-0.45**
Less developed regions	2.51	1.46	1.73	-0.68
Transition regions	1.38	0.50	1.53	-0.64
More developed regions	1.66	0.67	1.20	-0.22

Green bars indicate positive changes, red bars indicate negative changes
*Workplace-based employment divided by population aged 20-64
Less developed regions exclude Mayotte
Source: Eurostat [nama_10r_3empers], ARDECO, Cambridge Econometrics, AMECO, DG REGIO calculations

2.2.2 Capital metropolitan regions perform better than other regions

In 2019, metropolitan (metro) regions accounted for 59% of population in the EU, 63% of employment and 68% of GDP. Accordingly, they are major centres of employment and business activity with higher productivity than elsewhere.

Between 2001 and 2019, real GDP per head in metro regions grew faster than in others in all parts of the EU. (Table 2-5). This was a result mainly of above average growth rates in capital city regions, though other metropolitan regions also outperformed non-metropolitan regions, except in the north-western Member States.

In regions in the eastern and north-western Member States, the growth of GDP per head was mainly associated with productivity growth. The pattern is different in southern Member States. Productivity growth was very low during this period and most of the (modest) growth in GDP per head was associated with growth in employment. In capital metro regions in the eastern and

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southern Member States, the contribution of employment growth to GDP growth was double the average, reflecting a continuing concentration of employment there.

Metro and non-metro regions

Capital metro, other metro and non-metro regions are defined as follows. Metro regions are NUTS-3 regions, or groupings of NUTS-3 regions, representing functional urban areas of more than 250 000 inhabitants. Capital metro regions are those that include the national capital. Non-metros regions are all others.

More details can be found at:

http://ec.europa.eu/eurostat/statistics-explained/index.php/Territorial_typologies_for_European_cities_and_metropolitan_regions

Table 2-5: Changes in GDP per head, productivity and employment per head by type of region, 2001–2019

Average % change on the preceding year	GDP per head	Productivity	Employment relative to population*
Eastern MS			
Capital metro regions	4.1	2.8	1.3
Other metro regions	3.5	3.0	0.5
Non-metro regions	3.2	3.0	0.2
Total	3.6	3.1	0.5
North-Western MS			
Capital metro regions	1.3	1.1	0.2
Other metro regions	1.0	0.6	0.3
Non-metro regions	1.1	0.8	0.3
Total	1.1	0.8	0.3
Southern MS			
Capital metro regions	0.6	0.1	0.5
Other metro regions	0.4	0.2	0.2
Non-metro regions	0.1	0.1	0.1
Total	0.3	0.1	0.2

* This combines the employment rate and working-age population as a share of the total
Source: Eurostat [reg_eco10], ARDECO, Cambridge Econometrics, AMECO, DG REGIO calculations

Employment in both metro and non-metro regions increased between 2000 and 2008, although at a faster rate in capital metro regions than in other metro regions and by more in the latter than in non-metro regions (Figure 2-7). In the following two years, it declined markedly in all regions. In the capital city regions, it began to recover in 2010, with the growth rate accelerating in 2013 and continuing at the same pace up to 2019, when total employment was significantly higher than before the 2007-2008 crisis. In other metro regions, recovery was more hesitant. Employment remained below pre-crisis levels up until 2015, and from then to 2019, its growth rate was more modest than in the capital city regions. In non-metro regions, the effect of the

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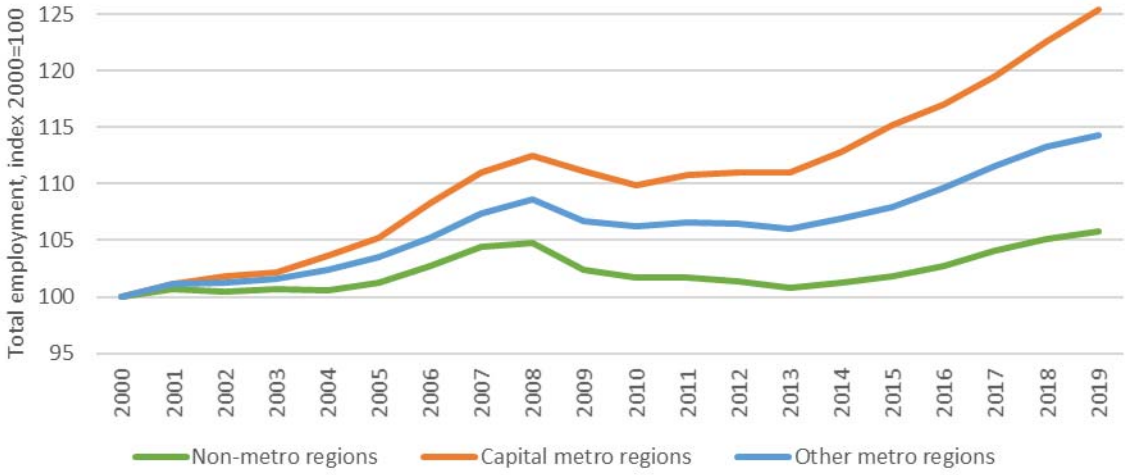
financial crisis was more sustained; employment only began to increase in 2013 and it grew by much less than in metro regions up to 2019, only reaching pre-crisis levels in 2018.

Figure 2-7: Evolution of total employment (number employed) in metro and non-metro regions, 2000-2019, (index 2000=100)



Source: Eurostat [reg_eco10], ARDECO, Cambridge Econometrics, AMECO, DG REGIO calculations

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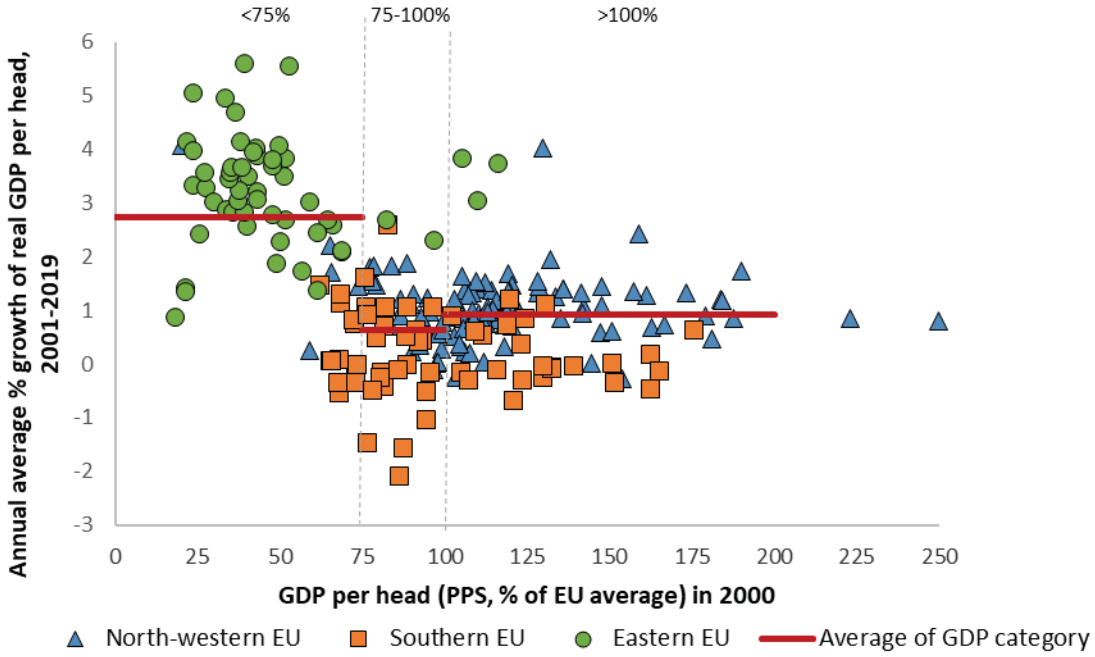
2.3 DEVELOPMENT TRAPS[10] AND RELATED RISKS FOR EUROPEAN REGIONS

2.3.1 Regional stagnation and development traps

It has become increasingly clear over recent years that not all regions in the EU with a GDP per head below the average are catching up. Regions can be categorised into different groups, defined in terms of their level of GDP[11], but also by their rates of GDP growth.

Relating the annual growth of real GDP per head over the 2001-2019 period to the initial level of development of regions in 2000, as measured by GDP per head, reveals some striking patterns (Figure 2-8).

Figure 2-8: Annual growth in real GDP per head in EU regions by level of development, 2001-2019



Source: Eurostat [nama_10r_2gdp], DG REGIO calculations

Some of the patterns are in line with convergence theory. In particular, many of the regions with GDP per head below 75% of the EU average in 2000 displayed strong growth over the subsequent 19 years, demonstrating rapid catching up. These regions are mainly those in eastern EU Member States. Conversely, many of the southern EU regions failed to achieve comparably high growth rates. A non-negligible number of southern regions experienced a reduction in GDP per head over the period, even if their initial GDP per head was below 75% of the EU average. Consistent with convergence theory, regions with above-average GDP per head in 2000, tended to have lower rates of growth.

[10] Prof. Simona, Prof. Andrés Rodríguez-Pose, and Prof. Michael Storper contributed substantially to the content of this section.

[11] Throughout this section regions are classified based on their GDP per head relative to the EU in 2000. The thresholds applied correspond to those currently used to classify regions as "less developed", "transition" or "more developed", but differ from those used in 2000. These group labels are therefore not used in this section.

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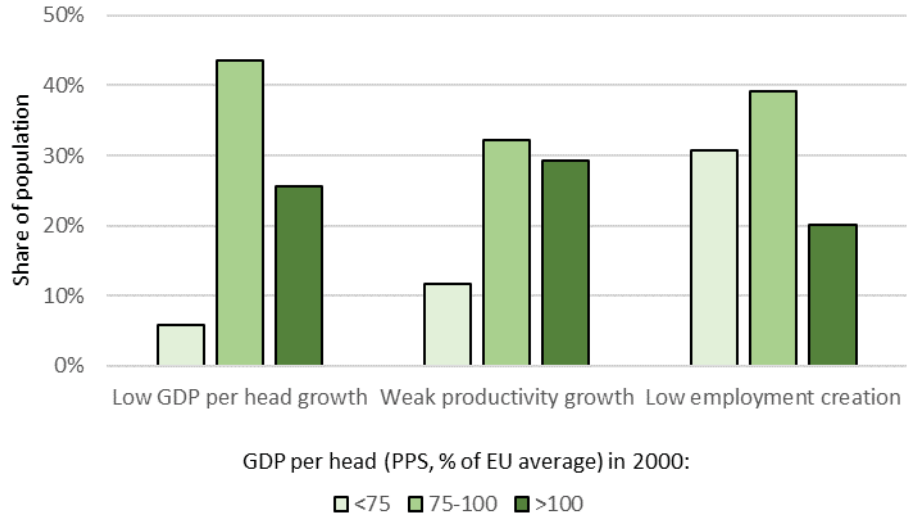
However, growth in the group of regions with GDP per head between 75% and 100% of the EU average (i.e. the middle category), does not show any indication of catching-up. Indeed, average growth in these regions was below that of those with above-average GDP per head. Many of them, primarily those in southern EU Member States, experienced lengthy periods of low or negative growth, weak productivity increases and low employment creation or even job losses.

Iammarino et al. (2020) develop a concept of 'development traps', which is based on more dimensions than just a slowdown in GDP growth. It covers three dimensions of the economic dynamism of a region: GDP per head, productivity and employment. Some 45% of the population of the above mentioned middle category regions in 2000 were in regions where growth was very low[12] over the 2001-2019 period (Figure 2-9). Moreover, a third of the population were in regions where productivity growth was very low and 40% in regions with very low employment creation relative to the change in population. All of these population shares are higher, in some cases considerably, than in other regions.

Figure 2-9: Share of population living in regions which experienced very low growth in GDP per head, productivity and employment, 2001-2019, by initial level of GDP per head (index, 2000=100)



Very low growth is defined here as annual average growth over the period in the bottom quartile of regions.
Source: Eurostat [nama_10r_2gdp], ARDECO, Cambridge Econometrics, AMECO, DG REGIO calculations

Since 2000, an increasing number of regions have experienced stagnating economic development after reaching a level of GDP per head of 75-100% of the EU average (Map 2-5). As this group has grown larger over time, transition out of it has become rarer. Indeed only one region (Zahodna Slovenija) out of a total of 53 regions in the middle category in 2000 managed to achieve above-average GDP per head by 2019.[13] On the other hand, in 18 of these regions,

[12] Here, very low growth is defined as annual average growth over the period in the bottom quartile of regions ranked by the rate of growth (i.e. in the 25% with the lowest growth over the period 2001-2019).

[13] It is worth noting that Zahodna Slovenija improved its performance over the period in terms of the indicators identified here as determining factors of the risk of being 'development-trapped', with a larger than average share of industry in GVA, higher than average R&D expenditure relative to GDP and a larger than average share of working-age population with tertiary education. Institutional quality, however, remains below the EU average.

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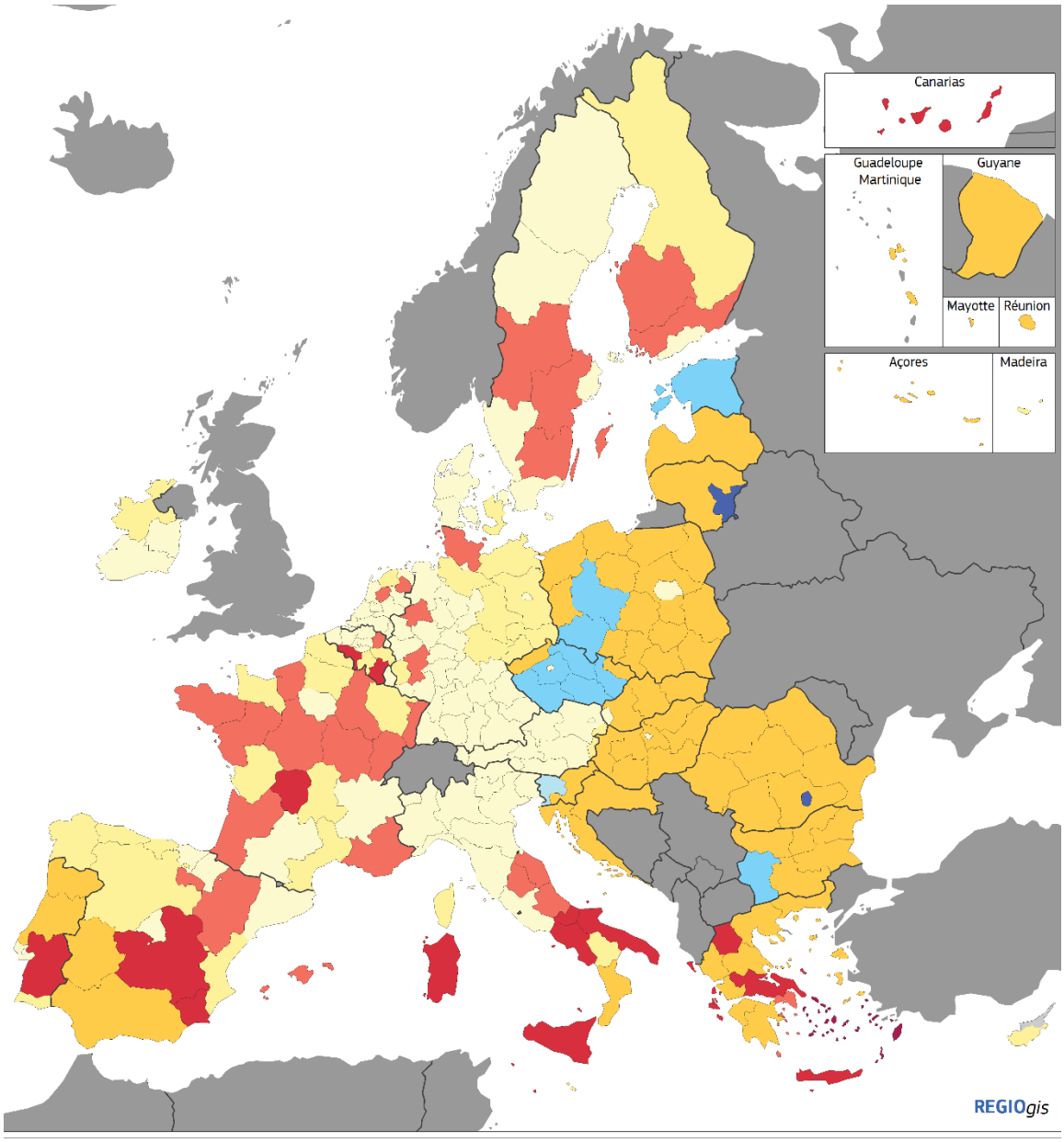
mainly in the southern EU, GDP per head fell below 75% of the EU average, implying divergence and increasing disparities.

Map 2-5: Transition of NUTS 2 regions between development categories, 2000- 2019



Transition of regions between development categories, 2000-2019

Transition matrix of GDP per head in PPS (index, EU-27 average = 100), 2000-2019

2000 \ 2019	< 75	75-100	>= 100
< 75			
75-100			
>= 100			

Source: DG REGIO based on Eurostat data (nama_10r_3gdp)

0 500 Km

© EuroGeographics Association for the administrative boundaries

The low growth of regions in the middle category suggests that they may have fallen into a development trap. Many of them are less cost-competitive than less developed regions, characterised by low-cost of capital and labour, and less innovative or productive than more

developed regions. Accordingly, their costs tend to be too high to compete with less developed regions and their innovation systems not strong enough to compete with more developed regions. This makes it very difficult for them to escape the development trap and achieve higher GDP per head. While some of these regions had low GDP per head earlier and were catching-up until some years ago, others were formerly relatively prosperous but have moved into a prolonged period of relative economic decline. Indeed, in a quarter of the regions with above average GDP per head in 2000, mainly in north-western but also in southern Member States, GDP per head had fallen below the EU average by 2019 (Map 2-5).

2.3.2 Identifying Development Traps in EU regions

In Iammarino et al. (2020) the risk of a region being in a development trap in a specific year is assessed in terms of the pattern of growth of GDP per head, productivity and employment, as well as their growth relative to that of the Member State the region is located in and the EU average.

How to calculate the risk of being in a development trap?

The methodology developed by Iammarino et al. (2020) to assess whether a NUTS 2 region is in a development trap in a specific year is based on the development over time of three variables: (i) GDP per head at constant prices, (ii) GVA per person employed (productivity) at constant prices and (iii) the ratio of employment to population.

For each of these three variables, the growth rate of the region over the 5-year period preceding the year in question is compared to three benchmarks:

- the growth rate in the region itself over the 5 years preceding this 5-year period
- the growth rate over the f5-year period in its Member State
- the average growth rate in the EU over this period.

This results in 9 comparisons (or 6 for Member States with only one NUTS 2 region).

Based on these comparisons, various risk indicators are calculated. The indicator used in this report is calculated as follows. For each of the nine comparisons, if the recent growth rate in the region is lower than the benchmark, the region receives a score of one; if not, a score of zero. The risk of the region falling into a development trap in the year in question is given by the average score over the 9 (or 6) comparisons.

For the analysis here, a region is considered to be 'in a development trap' in a specific year, if the risk of being trapped is greater than 0.5. A region is considered 'development-trapped' over the period 2000-2019 if in 15 or more years the risk is greater than 0.5.

Analysis based on this approach shows that the number of years that regions were in a development trap over the 2001-2019 period varies greatly between them (Map 2-6). In general, regions that were in a development trap in 15 years or more during this period (henceforth called 'development trapped' regions) are concentrated in southern EU Member States (especially in Greece and Italy) or are rural or old industrial regions in France. Some of the regions, however, are also located in many of the north-western Member States, and so include regions at different levels of initial development. Accordingly, three types of development-trapped region can be identified in terms of their GDP per head in 2000.

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- **Development-trapped regions with very low GDP per head**, which receive substantial Cohesion policy support, but which, unlike most of the other less developed EU regions, have struggled to sustain long term growth, so consistently lag behind other regions in the EU. Regions in this group include Calabria in Italy, and Anatoliki Makedonia, Thraki and Ipeiros, and Dytiki Ellada in Greece.

- **Development-trapped regions with below average GDP per head** between 75% and 100% of the EU average in 2000, but where economic dynamism has since stagnated. Accordingly, they have struggled to improve their standing, often in both relative and absolute terms. This group includes a number of regions in the Italian Mezzogiorno and regions in Portugal, Greece and Cyprus, as well as several regions in France and Wallonia in Belgium.

- **Development-trapped regions with above-average GDP per head**, which despite still being relatively prosperous have experienced frequent or long periods of below average growth in GDP, productivity and employment, often because of the demise of industries that used to be their main source of wealth. This group includes a number of regions in northern and central Italy, various regions in France, and a few in Spain, Portugal, Germany, Denmark, Austria and the Netherlands.

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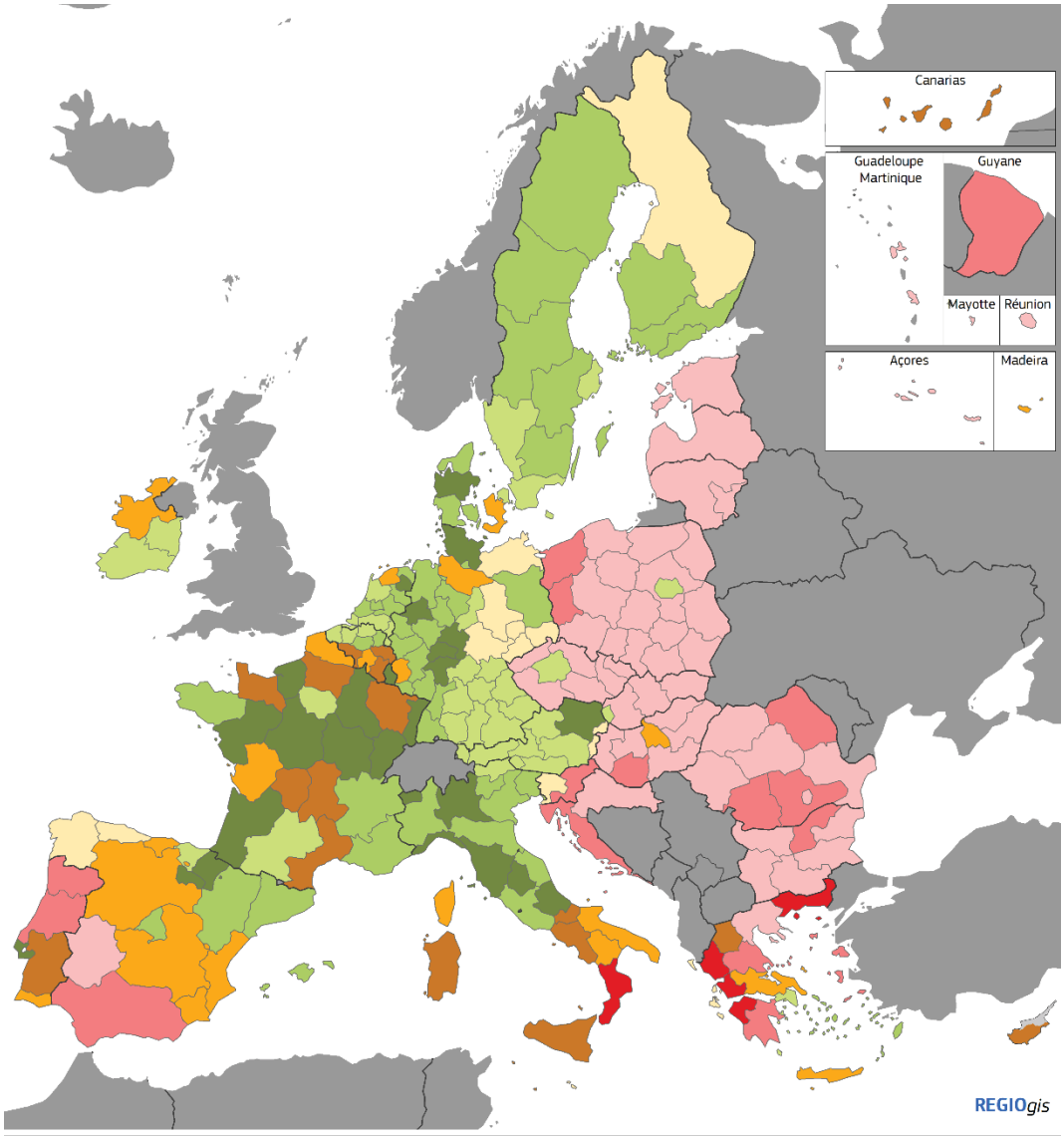
Map 2-6: Number of years in a development trap during 2001-2019 by level of GDP per head in 2000



Source: ARDECO, DG-REGIO

The reasons for falling into a development trap differ between regions. However, there are a number of common traits, including, for example the levels of value-added in industry, human capital, innovation endowment and institutional quality.

EU regions that were development-trapped in 2000-2019 tend to have a smaller share of industrial output in total production, smaller endowments of human capital, (fewer workers with

tertiary education,) and lower levels of support for science and technology (Table 2-6). Regions with a better quality of local government, and so a more favourable institutional environment, tend to fare better than those with low government efficiency, limited transparency and accountability, and more corruption. Development-trapped regions also tend to have higher old-age dependency rates and less demographic dynamism, though this is likely to be as much a consequence as a cause of being trapped.

Table 2-6: Socio-economic characteristics of development trapped regions and other regions by level of GDP per head

	Is the region development trapped?	GDP per head (PPS) in 2000, index			
		< 75%	75 - 100%	>100%	All
Share of Industry in GVA, %**	Yes	10.5	13.4	19.4	17.7
	No	25.7	19.7	20.8	21.3
R&D, % of GDP***	Yes	0.73	1.29	1.76	1.60
	No	0.93	1.36	2.67	2.30
Share of tertiary education, %*[1]	Yes	19.5	25.1	29.3	27.5
	No	26.3	31.3	36.9	32.7
Institutional quality (EQI index)***	Yes	-1.71	-0.29	0.31	-0.08
	No	-0.71	0.11	0.76	0.11
Share of total population by level of GDP per head, %***		26.2	17.9	55.9	100.0
Share of population trapped per level of GDP per head, %***		3.0	38.0	22.7	20.3

Source: Eurostat [nama_10r_3gva, rd_e_gerdreg, edat_lfse_04], ARDECO, Cambridge Econometrics, AMECO, World Bank, DG REGIO calculations

The differing characteristics of the regions suggest different approaches to avoiding being development-trapped, depending on a region's level of development. The chances of a region with below average GDP per head in 2000 avoiding being trapped are improved by having a better quality of government and larger industrial output. The latter would also improve the chances of transition regions in this respect. For more developed regions, the chances of staying out of a development trap are better if they have higher R&D investment and a more highly educated work force. In all regions, the chances could be improved by increasing the share of working-age population with tertiary education.

Regional development traps are a serious risk for the future of the EU. Springing these traps and so liberating the untapped economic potential of the many struggling and stagnating regions in the EU would not only increase their GDP, productivity and employment, but would also boost the growth potential of the EU as a whole. This is not just an economic matter; the sub-par economic performance and lack of employment opportunities are causing social costs and political resentment towards what is increasingly regarded as a system that does not benefit areas that are left behind, leading to a growing geography of discontent.[14]

Since development traps can occur at different levels of development, and appear to be a particular risk for transition regions, they may require policy responses that go beyond the poorest regions. Assisting all regions that are development-trapped to become more dynamic will help to reduce regional inequalities and counter the threat of rising discontent in EU societies.

[14] See Dijkstra et al. (2020), who show that political discontent with the EU in Member States and regions is linked to an important extent to economic and industrial decline.

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Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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CHAPTER 2. A SMARTER EUROPE – PART 2

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2.4 COMPETITIVENESS OF EU REGIONS

2.4.1 Innovation, digitalisation and smart specialisation

Innovation is an important driver of long-run productivity growth and, as such, is a key factor in supporting the competitiveness of firms. This is especially important for firms in the EU, which increasingly have to compete with firms in developing regions of the world, such as in South East Asia, which benefit from cheaper labour, less labour market regulation, and fast technological catch-up (World Economic Forum, 2019). The capacity to innovate, and to take up innovation produced elsewhere, is of prime importance, especially since, unlike cost-reduction strategies, innovation is, in principle, without bounds, and so is central to sustaining growth over the long-term.

However, concern has risen about a growing research and innovation divide, linked to geographical concentration, both within Member States and across the EU, of the most innovative firms and research centres. While concentration can result in positive externalities of research and innovation, the core areas are very often located in more developed regions[1], so widening geographic disparities.[2] This research and innovation divide may be further fuelled by the ongoing process of digitalisation.

Measuring innovation is widely recognised as challenging (OECD and Eurostat, 2018).[3] The most commonly used indicator, the number of patent applications, gives only an approximate measure of the real innovation activity because it captures only innovations registered at the European Patent Office. These relate mainly to technological innovation in industry, while many if not most innovations in services, which are often intangible, remain unpatented.[4] Nevertheless, though limited, patents provide a useful means of comparing performance of technological innovation across regions.

Over the period 2016-2017, 122 patent applications per million inhabitants were registered at the European Patent Office (Map 2-7). These show a distinct spatial pattern, regions with most applications being located mostly in the north-western Member States and in northern Italy. At the NUTS 3 level, Ludwigshafen in Germany, home to BASF, had the highest number (3 224 per million inhabitants in the period), followed by Erlangen, home to a major Siemens site (2 558) and Zuidoost-Noord-Brabant in the Netherlands (2 529), home to Philips. The degree of concentration suggests a regional innovation divide between the most advanced Member States and regions and the others.

Metropolitan areas tend to offer an environment that is particularly conducive to the development of new ideas, products and processes. A vast literature explains the reasons for this – the presence of a creative and skilled work force, specialised clusters of economic activity,

[1] See (Rodríguez-Pose, 2020) for an analysis of the economic consequences of the research and innovation divide in the EU.

[2] For example, European Commission (2020) concludes that increasing concentration of economic and innovative activities in capitals and metropolitan areas, on the one hand, and declining or peripheral areas on the other lead to negative developments in regions with low capacity to exploit innovation.

[3] This is particularly true in a sub-national context, which highlights the need to work on better territorial innovation data as mentioned for example in the Commission's Communication on a long-term vision for rural areas (COM(2021) 345 final).

[4] This also holds for practices in primary production and organisational and social forms of innovation that can contribute to social capital.

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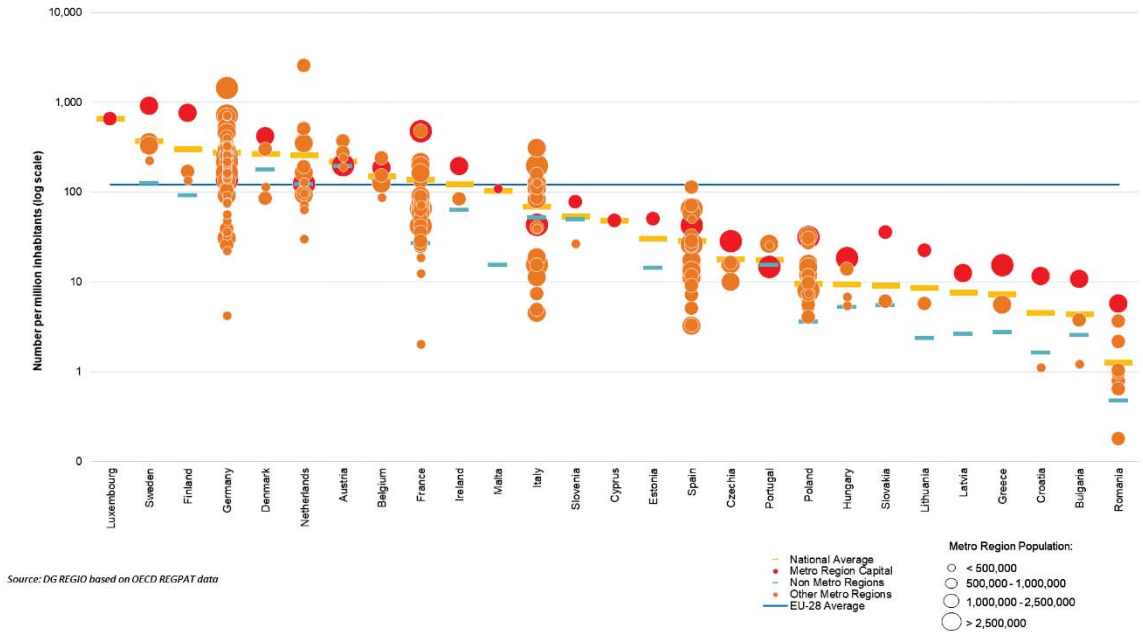
universities and research institutes.[5] There are clear differences in patenting activity between metropolitan (metro) regions (around 167 applications per million inhabitants) and non-metro regions (around 58 per million inhabitants) (Figure 2-10). In quite a few metro regions, however, applications are less than in non-metro regions in the same country, indicating that not all metro regions offer a favourable innovation environment. Still, the distinct spatial pattern and concentration in metropolitan areas of patent applications are further indications of a research and innovation divide in the EU.

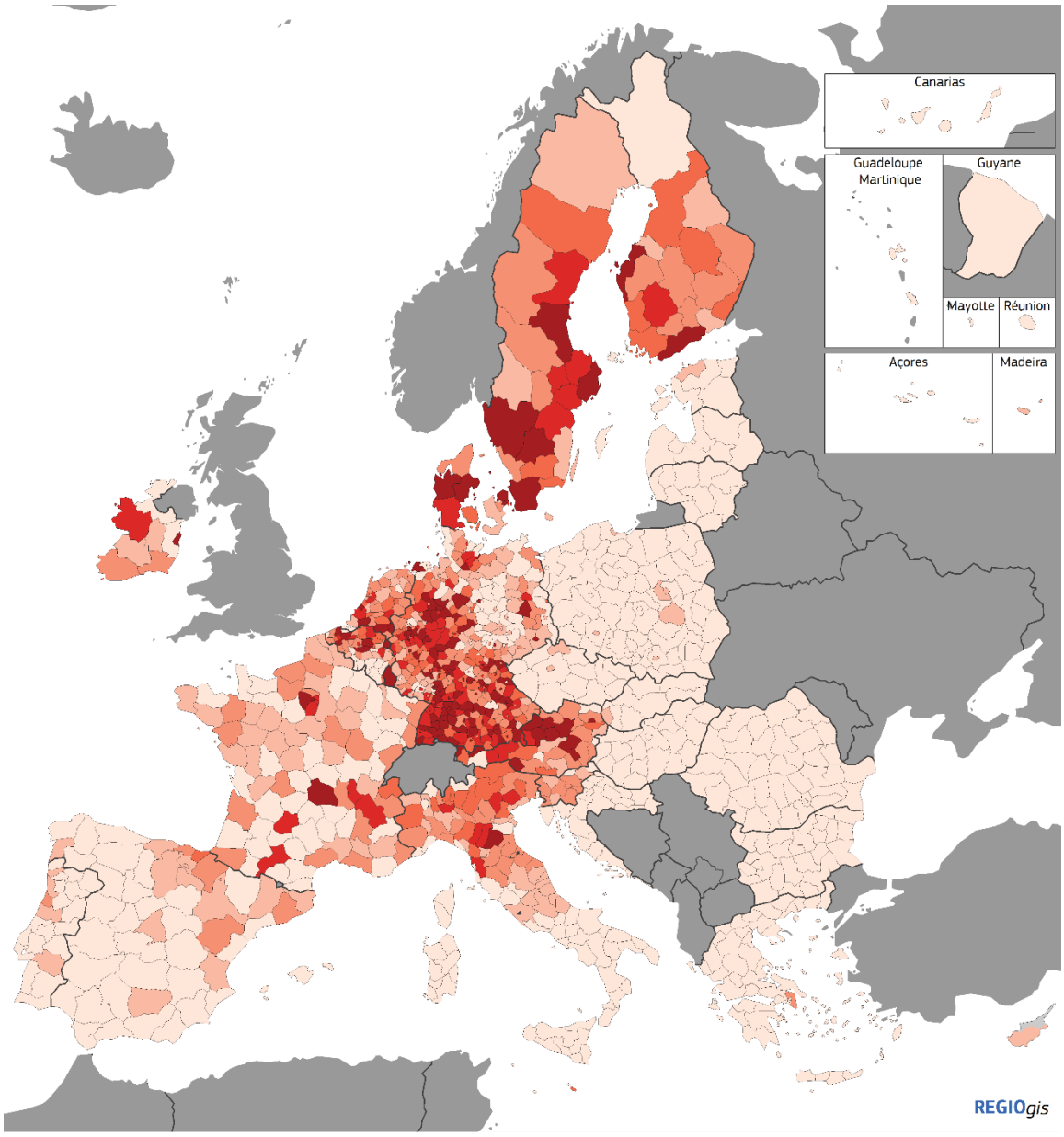
Figure 2-10: Patent applications to the European Patent Office by type of region, 2016-17



Source: OECD REGPAT, DG REGIO calculations

[5] European Union and UN-HABITAT (2016).

Map 2-7: Patent applications to the European Patent Office, average 2016-2017



Patent applications to the European Patent Office (EPO), average 2016-2017

Applications per million inhabitants

- < 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 250
- >=250

EU-27 = 121.7
Sources: DG REGIO based on OECD REGPAT database July 2021 and Eurostat population data (nama_10r_3popgdp)

0 500 Km

© EuroGeographics Association for the administrative boundaries

Source: Eurostat, REGIO-GIS

Global value chains, foreign direct investment and inequality

Technological change coupled with the intensification of global value chains (GVCs) have spurred the need to place national and regional economic development and innovation policy in an open and interdependent framework. Multinational enterprises (MNEs), by carrying out different forms of investment abroad, are considered key actors behind connectivity and global economic integration of countries and regions worldwide, while also being critical players in international trade flows. Often described as "two sides of the same coin", (Krugman, 2007), trade and investment seem to be intertwined in a more complex manner within GVCs (OECD, 2018 p. 31). In fact, trade flows can be equity led or non-equity led. The former involves networks of foreign affiliates established via foreign direct investment (FDI), which are highly engaged in GVCs (e.g. Altomonte et al., 2012) while non-equity-led trade involves more contractual partners and arm's length external suppliers (Taglioni and Winkler, 2014). As such, trade in GVCs and FDI are complementary phenomena that need be taken simultaneously into account when trying to capture the geographical and functional dimension of global connectivity.

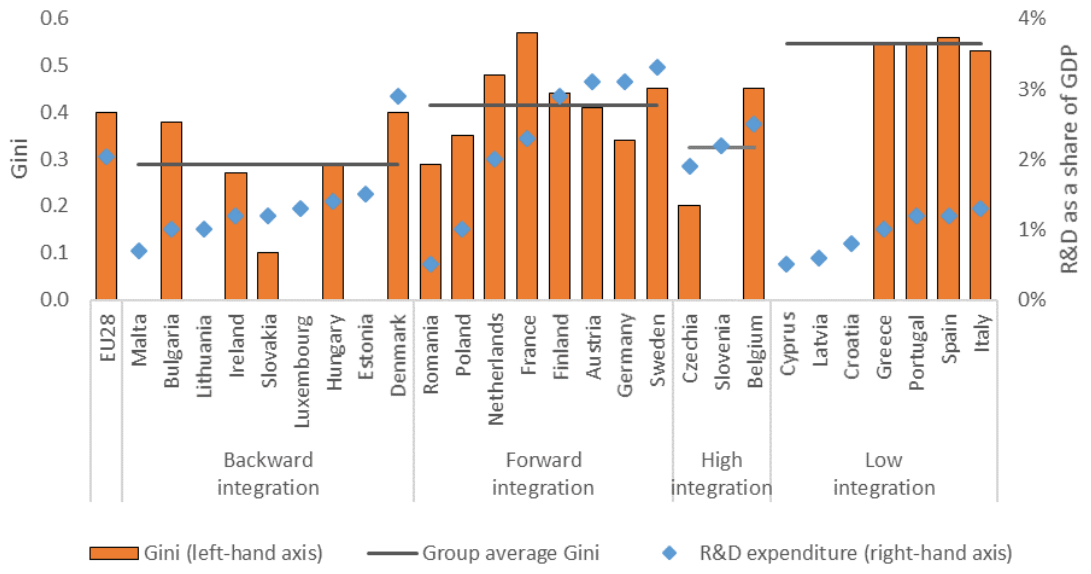
Two measures of GVC participation can be distinguished: (a) Backward Linkages: share of foreign value-added in the total exports of a country; and (b) Forward Linkages: domestic value-added embodied in exports of intermediates that are further re-exported to third countries, expressed as a ratio of gross exports. By looking at the relative position of each country with respect to the EU average, it is possible to identify four broad groups of economies:

1) **High GVC Integration:** Higher Backward – Higher Forward **(H-H)** Linkages
2) **Low GVC Integration:** Lower Backward – Lower Forward **(L-L)** Linkages
3) **Backward GVC Integration:** Higher Backward – Lower Forward **(H-L)** Linkages
4) **Forward GVC Integration:** Lower Backward – Higher Forward (**L-H)** Linkages

The *Forward GVC integration* group comprises the most innovative countries in terms of R&D expenditures (as well as patents), Poland and Romania being exceptions. Within this group there is a relatively high inter-regional dispersion of GDP as measured by the Gini coefficient (Figure 2-11). Conversely, *Low GVC integration* economies show low values of R&D (and patents), but also have big economic disparities. The *High GVC integration* countries show varying economic disparities, while *Backward GVC integration* countries show low shares of R&D expenditure (except Denmark) and lower economic disparities.

Leading industrial regions in Europe follow patterns and hierarchies symmetric to those of capital regions. Higher levels of both inward and outward FDI characterise advanced regions in the *Forward GVC integration* economies such as Bayern, Baden-Württemberg, Hessen, Nordrhein-Westfalen, Niedersachsen and Rheinland-Pfalz (Germany), Zuid-Holland and Noord-Holland (the Netherlands), Sydsverige (Sweden), and Pomorskie and Malopolskie in Poland. Similarly, some key industrial regions in the *Low GVC integration* countries display relatively high levels of both inward and outward FDI: Piemonte (Italy), Cataluña, País Vasco, Galicia and Andalucia (Spain). Flanders (Belgium), in the *High GVC integration* category, follows similar patterns, while industrial eastern EU regions in the *Backward GVC integration* group mostly show internationalisation profiles skewed towards inward FDI.

Figure 2-11: GVC profile, R&D expenditure (% of GDP) and Gini-coefficient by Member State



Source: Eurostat. DG-REGIO elaboration. The GINI coefficient is not provided for countries with only one or two NUTS-2 regions.

A widely used indicator of innovation capacity, rather than performance, is expenditure on R&D relative to GDP, which is a measure of input into the innovation process, or the effort made, rather than of output. As in the case of patents, however, R&D expenditure is likely to underestimate innovation activity, particularly in sectors outside industry where non-technological and non-research-based innovation is common.

Expenditure on R&D in the EU amounted to 2.2% of GDP in 2019 (Figure 2-11) and increased only marginally over the previous two decades (from 1.8% of GDP in 2001). The expenditure rate increased in all Member States, except for Sweden and Finland, where it had already reached a high level in 2001, and Luxembourg[6]. Despite the overall increase, in most Member States the expenditure rates for the most part remain well below those in other highly developed economies, especially Japan (where expenditure was 3.2% of GDP in 2019) or the US (where it was 3.1%). There is also no evidence of convergence in rates within the EU, countries with comparatively low R&D expenditure in 2001 having the smallest increase in spending over the 2001-2019 period, suggesting a widening research and innovation divide between Member States.

R&D expenditure in the EU is highest in the north-western regions (at an average of 2.7% of GDP in 2019) and lowest in the east (1.3%) and south (1.4%). At the NUTS2 level, spending is highest, at over 7% of GDP, in Braunschweig and Stuttgart in Germany and Brabant Wallon in Belgium (Map 2-8).

[6] The decrease in Luxembourg is linked to the fact that business R&D spending strongly decreased over the past decade. This is possibly related to the potentially large impact of the behaviour of few multinational companies on official business R&D statistics (see OECD 2019).

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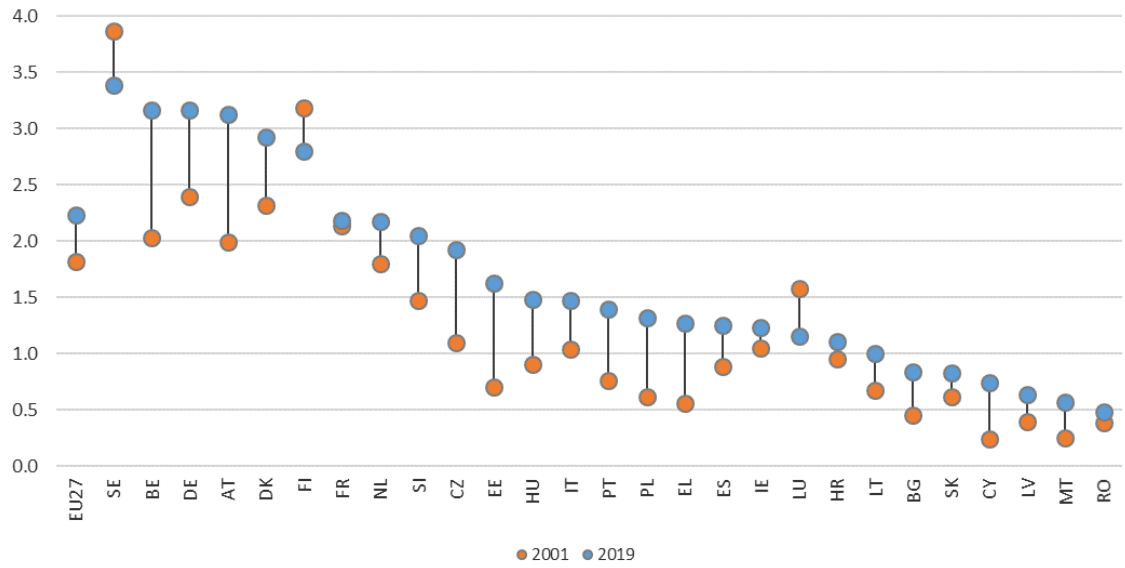
In general, regions with the highest R&D expenditure tend to be the most developed and often include capital cities (Belgium and Germany are notable exceptions) (Figure 2-13). Of the 20 regions with the highest expenditure, 19 are more developed with GDP per head above the EU average, while two third of the 50 regions with the lowest expenditure are less developed with GDP per head below 75% of the average.

Figure 2-12: Total expenditure on R&D as a % of GDP, 2001 and 2019



The 2001 figure for LU relates to 1999, for MT and HR to 2002.
Source: Eurostat [rd_e_gerdreg], DG REGIO calculations.

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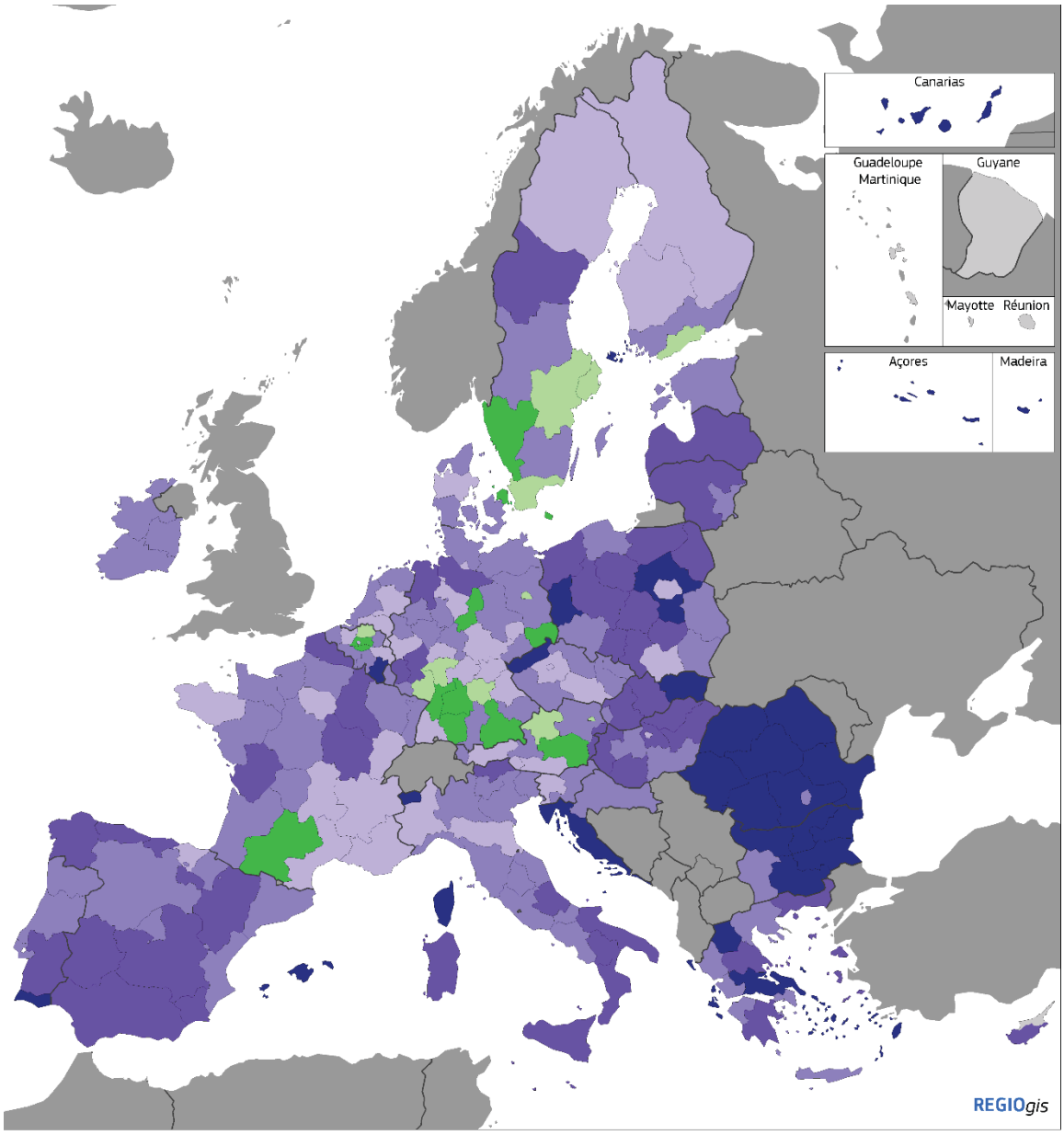
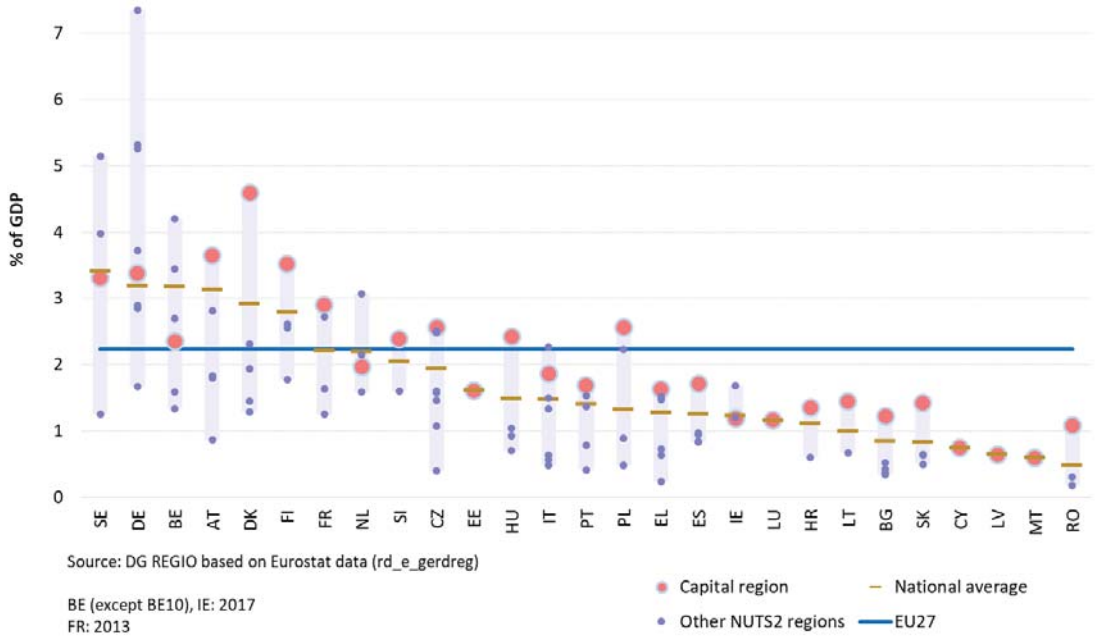
Map 2-8: Total expenditure on R&D as a % of GDP, 2019



Source: Eurostat, REGIO-GIS

Figure 2-13: Total expenditure on R&D as % of GDP, 2019



Note: BE (except BE10) and IE relate to 2017. FR relates to 2013.
Source: Eurostat [rd_e_gerdreg], DG REGIO calculations

In 2019, expenditure on R&D relative to GDP exceeded the Europe 2020 target of 3% only in a small number of NUTS 2 regions, accounting for just 12% of EU population (Table 2-7). These are all more developed regions in the north-west of the EU, except Dresden (Germany) which is a transition region. None of the less developed regions met the 3% target, with expenditure on average over 2 pp below the target.

Table 2-7: Total R&D expenditure and the distance to the Europe 2020 target, EU-27 regions, 2019

	Less developed	Transition	More developed	EU27
R&D expenditure as % of GDP, 2019	1.0	1.4	2.5	2.2
Distance to EU target (% point difference)	2.0	1.6	0.5	0.8
% of population living in regions* that have reached the EU target	0.0	2.9	20.1	11.9

BE (except BE10) and IE relate to 2017. FR relates to 2013.
* Includes only regions for which data are available
Source: Eurostat, DG REGIO calculations

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The Regional Innovation Scoreboard

The Regional Innovation Scoreboard (RIS) 2021 highlights the key role innovation plays in regional development.[7] The RIS, an extension of the European Innovation Scoreboard (EIS), assesses the innovation performance of regions on the basis of a subset of the indicators included in the EIS. In 2021, it covers 215 regions in the EU[8], plus 30 regions in Norway, Serbia, Switzerland and the UK.

The most innovative regions in the EU by this measure are Oberbayern (Germany), Hovedstaden (Denmark), Etelä-Suomi (Finland) and Stockholm (Map 2-9). Despite some regional variation within countries, the ranking of regions largely matches that of Member States, suggesting that indicator values at the regional level are affected by national characteristics. Most regional 'innovation leaders' are in countries which are also identified as 'innovation leaders' or as 'strong innovators', and almost all of the regional 'moderate 'and 'modest' innovators are in countries categorised in the same way. However, regional 'pockets of excellence' are evident in some 'moderate innovator' countries, including capital city regions in Czechia, Spain, and Lithuania as well as País Vasco in Spain, while some regions in 'strong innovation' countries lag behind.

Regional Innovation Scoreboard (RIS) methodology

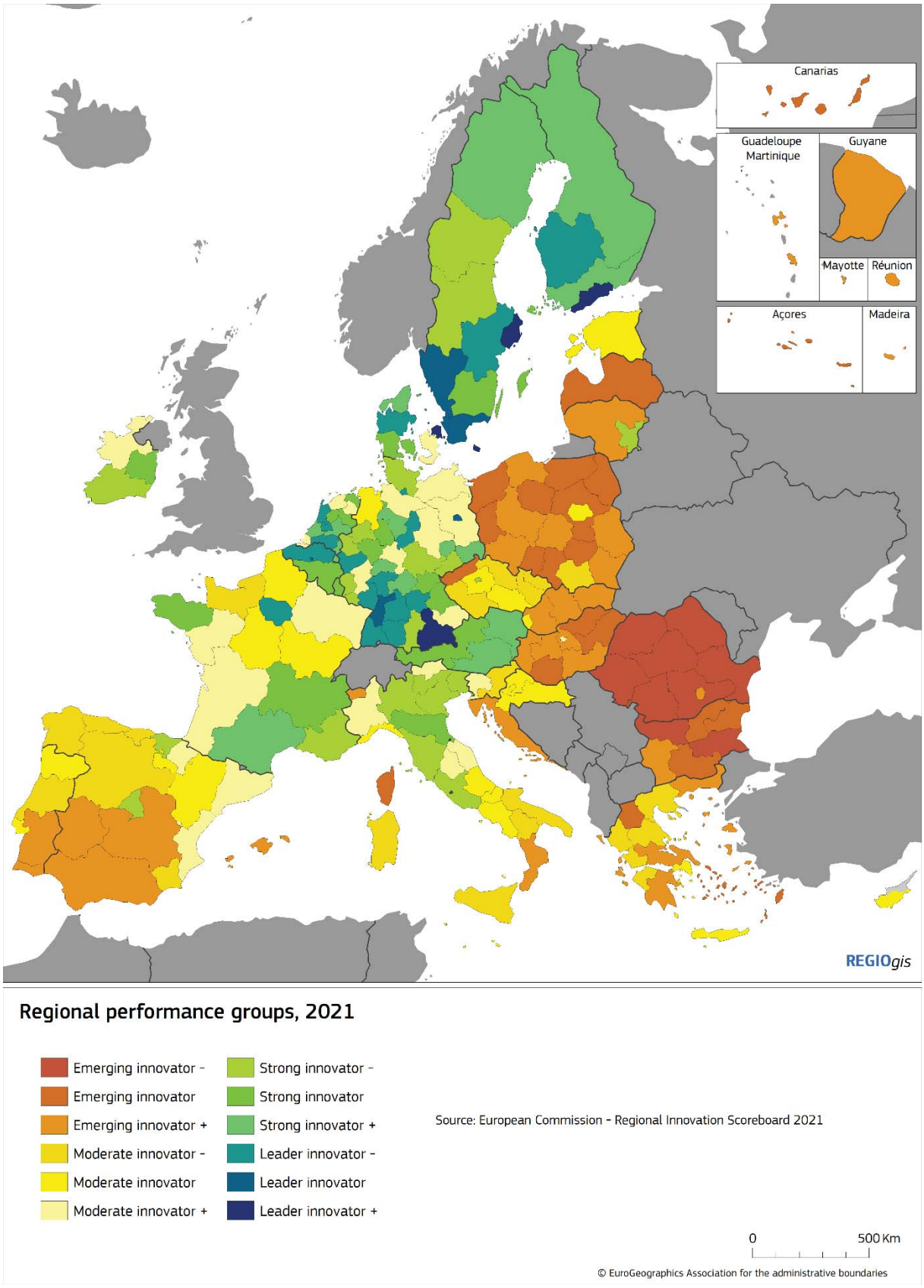
The 2021 edition of the Regional Innovation Scoreboard (RIS) provides a comparative assessment of innovation systems across regions. It is based on data for 21 of the indicators used in the European Innovation Scoreboard. This set of indicators covers higher education, scientific publications, ICT skills, R&D expenditure, business innovation, and patenting. Data come from a variety of sources including Eurostat, SCOPUS (Science-Metrix), the Community Innovation Survey (Eurostat and National Statistical Offices) and the European Union Intellectual Property Office (EUIPO).
Indicator values are normalised by using the min-max procedure, i.e. the difference between the observed score and the maximum score across all regions is calculated and then divided by the range between the minimum and the maximum scores across all regions. The overall RIS score is calculated as the unweighted average of the indicator scores. The RIS then classifies regions into four innovation performance groups based on their overall RIS score relative to the EU average: 'leader innovators (26 EU regions), strong innovators (55 EU regions), moderate innovators (69 EU regions), and emerging innovators (65 EU regions). A more detailed breakdown of these performance groups is obtained by splitting each group into a top third, middle third, and bottom third.

For more details, see: https://ec.europa.eu/info/research-and-innovation/statistics/performance-indicators/regional-innovation-scoreboard_en

[7] Regional Innovation Scoreboard 2021, available at: https://ec.europa.eu/info/research-and-innovation/statistics/performance-indicators/regional-innovation-scoreboard_en

[8] All Member States are covered at the NUTS 2 level except for Austria, Belgium and France, which are covered at the NUTS1 level.

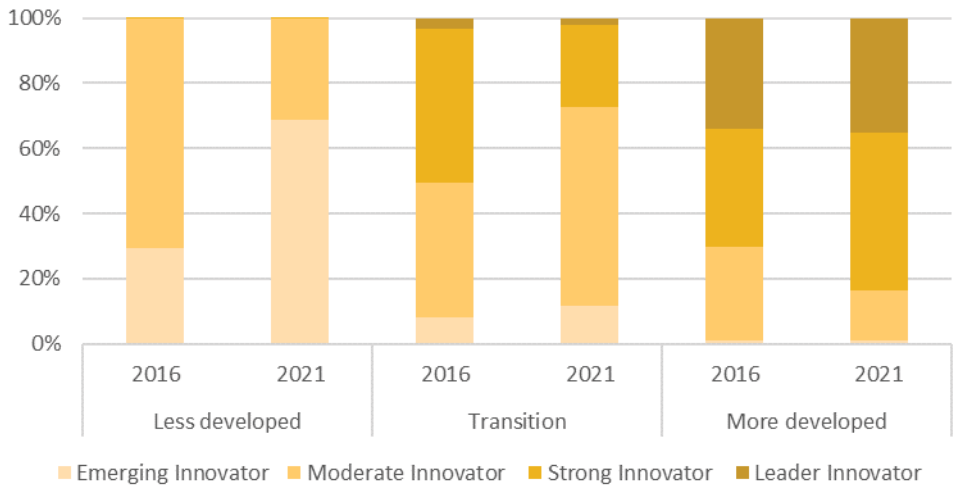
Map 2-9: Regional Innovation Scoreboard, 2021



Source: Regional Innovation Scoreboard 2021, REGIO-GIS

There is a close relationship between the level of development of regions and the innovation score (Figure 2-14). In 2021 about 70% of the population of less developed regions live in an 'emerging innovator' region, which is twice as much as in 2016. This indicates that a large number of less developed regions that used to be moderate innovators have become emerging innovators. Furthermore, none of them live in a 'strong' or a 'leader innovator' region. Accordingly, during the last five years, the less developed regions have fallen further behind in terms of innovation, rather than catching up with the other regions. At the other end of the spectrum, 'leader innovators' are almost exclusively in the group of more developed regions, with only 2% of the population in transition regions living in a region in this category in 2021. The majority of 'strong innovators' are also in the more developed regional group, with 84% of the population of these regions in 2021 living either in a 'strong' or a 'leader innovator' region, up from 70% in 2016.

Figure 2-14: Share of EU population by RIS category and level of development, 2016 and 2021



Note: In cases where the RIS score is only available at NUTS1 level, it is assumed that the same score applies to the latter's constituent NUTS2 regions. Calculations for both years are based on 2021 population data and level of development classification.
Source: Regional Innovation Scoreboard 2021, DG REGIO

In general, the RIS confirms the wide diversity of EU regions in terms of innovation performance, so highlighting the fact that innovation has a strong regional dimension. Because of this, measures supporting innovation, including Cohesion policy programmes, need to take explicit account of the regional or local context when devising the kind of support to provide. As it is inherently place-based, the Smart Specialisation approach helps in this regard.

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Smart Specialisation strategies

Smart Specialisation is a place-based approach to the governance of innovation policy that focuses investment in research and innovation on selected areas of activity, identified through a wide and inclusive process to mobilise the local knowledge of relevant stakeholders, including businesses, public bodies, research organisations and civil society.

Conceived in the 2014-2020 programming period, Smart Specialisation strategies are defined by Regulation (EU) 1301/2013 as "*the national or regional innovation strategies which set priorities in order to build competitive advantage by developing and matching research and innovation own strengths to business needs in order to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts.*".

In practical terms, the Smart Specialisation approach concentrates resources into carefully defined "priority areas". These priority areas can be framed in terms of knowledge fields or activities (not only science-based but also social, cultural, and creative ones) or sub-systems within an economic sector or cutting across sectors. They can also correspond to specific market niches, clusters, technologies, or applications of technologies to specific societal and environmental challenges. These priority areas should at the same time be in line with the region's existing assets and be able to take advantage of innovation opportunities.

Smart Specialisation strategies were introduced in 2014-2020 as an *ex ante* condition for all investment priorities under Thematic Objective 1 of the ERDF. A distinct feature is that Member States or regions need to identify priorities for investment through an 'entrepreneurial discovery process', involving key innovation stakeholders, business, and all actual or potential innovation actors that may possess crucial knowledge about new activities to establish in the country or region..

Smart Specialisation was an integral part of Cohesion Policy in the 2014-2020 period. A total of 180 Smart Specialisation strategies were formulated in this period, with ERDF investment of over EUR 40 billion (EUR 68 billion including national co-financing).

A partial transition towards innovative and smart transformation

Although it is still too early to assess the impact of Smart Specialisation on innovation, jobs and productivity, there is already some evidence of how the policy has been implemented on the ground and its effect on policy making.

A recent study (Prognos and CSIL, 2021) shows that in most regions, the prioritisation of investment was based on a broad and inclusive 'entrepreneurial discovery process', which in most cases was specifically set up for formulating the Smart Specialisation strategy. About half of the 180 strategies, as well as about half of the ERDF funding available for these, concerned projects in the Agrofood & Bioeconomy (21%), Health & Life Sciences (15%) or ICT & Industry 4.0 (15%) sectors. Although the extent of prioritisation differs between the regions, there is evidence that the selected priorities closely reflect the scientific and technological profile of regions and public and private sector strengths.

Strategies do not necessarily match the current economic structure as reflected in the sectoral division of employment, but they more often prioritise sectors in transformation, as measured by growth rates of employment. Smart Specialisation eligibility criteria seem to have been generally well applied in selecting projects and the resulting ERDF investments in research and innovation largely match the priority areas selected.

Although challenges remain, new practices in public administration seem to have emerged at national, regional and local level. In particular, recent studies, based on policy-maker perceptions and case-studies (Hegyi et al., 2021; Guzzo and Gianelle, 2021), suggest that the Smart Specialisation experience has improved coordination and strengthened the network of relations between regional and local actors, as well as making the decision-making process and the governance of innovation policy more inclusive. It seems also to have helped reorganise and/or establish coordination bodies, platforms, thematic working groups and clusters. Nevertheless, the effectiveness of coordination between the public and private sectors and within public authorities remains an issue in several regions. More efforts are needed in the future in this regard, along with strengthening the skills and resources to perform policy functions. A clear and, if possible, dedicated structure of governance has proved to be important in this respect.

Expanding digitalisation

Digital technologies have the potential to boost more inclusive and sustainable growth by spurring innovation, generating efficiencies and improving services.[9] The current Commission has put the green and digital transition, the so-called 'twin transition', on top of the political agenda as the two trends that will shape Europe and its future. A goal of the EU is to boost the digital transformation of businesses by encouraging the take-up of three digital technologies[10]: cloud computing services, use of big data and Artificial Intelligence (AI). The objective is that 75% of European enterprises[11] will have taken these up by 2030.

The take-up of Cloud Computing in 2020 was greater than for the other two technologies (Figure 2-15), and the share of enterprises using it was twice as large as in 2014, a rate of increase, which, if it continues, will enable the 2030 target to be achieved. The take-up of big data and AI remains much smaller, which might be a result of these being newer and possibly less generally applicable from a business perspective.

The take-up of digital technologies in the EU masks pronounced differences between Member States. For each of the three technologies, businesses in less developed countries lag behind, the take-up being highest in highly developed Member States.

[9] OECD (2021) https://www.oecd.org/g20/topics/digitalisation-and-innovation/

[10] European Commission (2021b) EC Communication on the 2030 Digital Compass: the European way for the Digital Decade. COM (2021) 118 final.

[11] All enterprises outside the financial sector with 10 persons or more employed (Eurostat code 10_C10_S951_XK).

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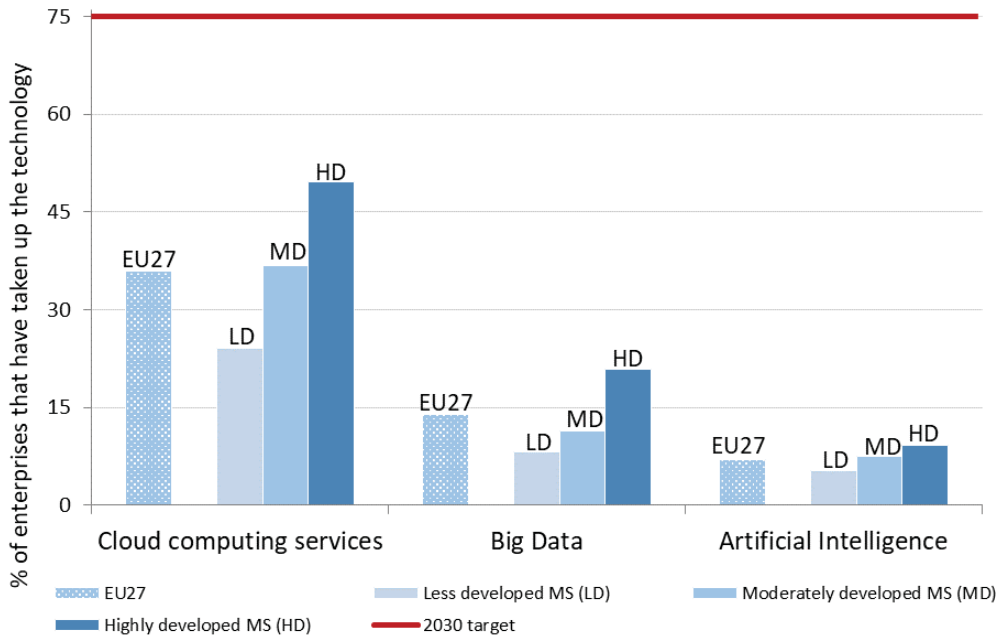
Figure 2-15: EU enterprises take-up of digital technologies by Member State level of development, 2020



All EU enterprises outside the financial sector with 10 or more persons employed are covered (Eurostat code 10_C10_S951_XK).
Source: Eurostat [isoc_eb], DG REGIO calculations

A similar pattern is seen for the take-up of e-commerce and e-business technologies (Figure 2-16). A sufficiently fast internet connection is required for such take-up. On average, some 46% of enterprises in the EU have broadband with a speed at least 100 Mb/s, but the figure is smaller in less developed Member States. Businesses in less developed Member States also lag behind in terms of the take-up of two specific e-business solutions, namely the use of business processes which are automatically linked to those of their suppliers or customers and the use of ERP (Enterprise Resource Planning) software to share information between different functional areas. The same is the case for e-commerce sales and online purchases. Both the share of enterprises with e-commerce sales of at least 1% of turnover and the share with online purchase of at least 1% of the total are smaller in less developed Member States, although the difference with other Member States is larger for the latter share

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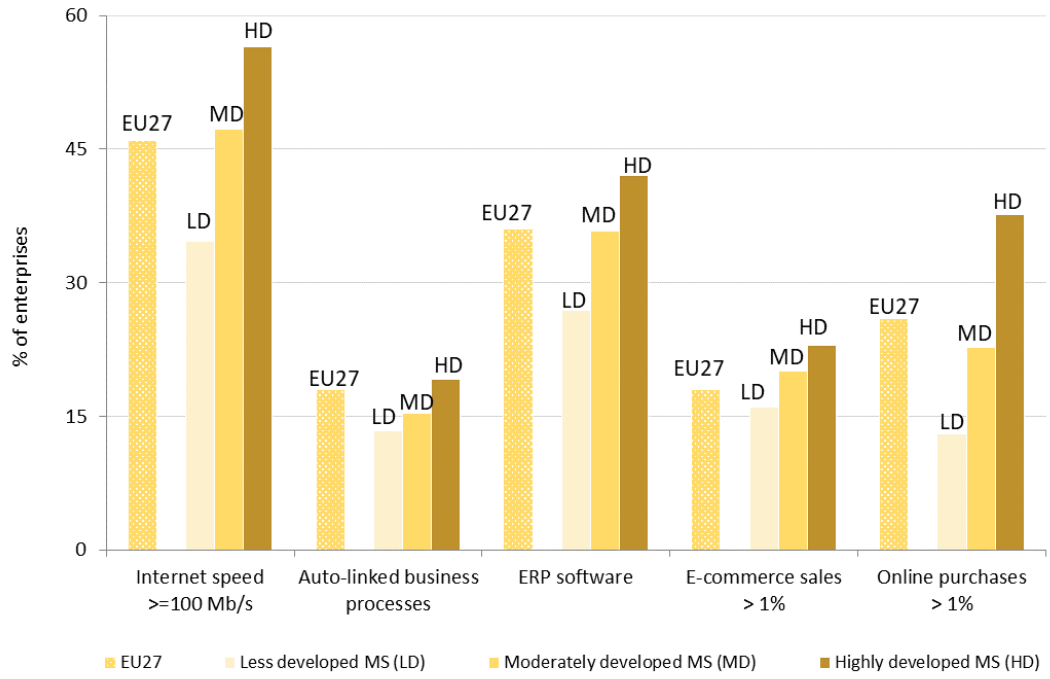
Figure 2-16: EU enterprise take-up of e-commerce and e-business technologies by Member State level of development, 2020



All EU enterprises outside the financial sector with 10 or more persons employed (Eurostat code 10_C10_S951_XK) are covered.
The full definitions of the five indicators are: (1) the maximum contracted download speed of the fastest fixed line internet connection of at least 100 Mb/s; (2) enterprises with business processes automatically linked to those of their suppliers and/or customers; (3) enterprises with ERP software package to share information between different functional areas; (4) enterprises with e-commerce sales of at least 1% turnover; (5) enterprises purchasing at least 1% of the total online.
Data on ERP software relate to 2019; auto-linked business processes to 2017; online purchases to 2018, except AT, DE, IT, SE, EU27: 2017; EE, HR, SI: 2016; FI, MT: 2015.
Source: Eurostat [isoc_eb, isoc_ec], DG REGIO calculations

These results confirm that digitalisation may further fuel the research and innovation divide, at least between Member States. Given the increasing importance of digital technologies for enterprises to remain competitive, this is a cause for concern from a cohesion perspective. Since technology take-up is an important driver of economic convergence, less developed Member States risk falling further behind rather than catching-up, if their businesses do not innovate by adopting digitalisation. Moderately developed Member States may also see their capacity to compete diminished if they fail to do likewise, so risking falling into, or remaining in, a development trap (as indicated in Section 2.3 above).

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Regional cohesion: Corporate divergences and how to address gaps

The pandemic has highlighted gaps among regions and societal groups. Firms across the EU were hit by the COVID-19 shock to different extents, depending on sectoral activities and their ability to adapt to the pandemic situation. The crisis accelerated structural economic and societal change, creating some risks for cohesion as firms are adjusting at different speeds to the emerging recovery phase, marked by a stronger emphasis on digitalisation.

The European Investment Bank's Investment Survey (EIBIS)[12], an annual corporate survey that gathers insights on the investment landscape in the EU, helps shed light on the effects of the COVID-19 crisis on investment and how these link to regional cohesion. For this, firms' responses are grouped depending on their location in less developed, transition, and more developed regions.[13]

EIBIS results show that cuts to investment activity triggered by COVID-19 came on top of lower initial investment activity, particularly in less developed regions. Here, 79% of firms undertake investment, compared to 85% in transition, and 87% in more developed regions.[14] Firms in less developed and transition regions tend to be smaller and fewer to export compared to more developed regions. Firms' investment activities in less developed and transition regions tend to be tilted towards tangibles; a lower share of firms targets investment towards research and development compared to peers in more developed regions, where more active innovators (firms that heavily invest in R&D) are located (Figure 2-17).

Firms in less developed and transition regions operate in a more challenging environment and report obstacles to investment more often; they find considerably more often that their investment is hindered by uncertainty, energy costs, and access to transport infrastructure and finance.

A more challenging investment environment together with structural differences pre-dating the pandemic can hamper adjustment to the emerging recovery phase. Fewer firms in less developed and transition have reacted to the pandemic by becoming more digital, while many in more developed regions are pulling ahead.

Policy measures have helped to limit the immediate adverse impact of the pandemic on jobs. However, a higher share of firms expect the COVID-19 outbreak to lead to a decrease in employment in the longer term (19% in less developed and 14% in transition regions compared to 12% in more developed ones). Structural shifts towards a greener and more digital economy and innovation will be important to maintain competitiveness and support economic catch up also in less prosperous regions, to maintain and nurture quality employment opportunities in the longer-term. EIBIS analysis shows that the pandemic has negatively impacted on human capital formation, with fewer adults participating in training and schools being closed across the EU. What is more, school closures are likely to have accentuated regional disparities as less wealthy Member States closed schools for longer. This underscores the need to invest in human capital as

[12] Available at this link: https://www.eib.org/en/publications-research/economics/surveys-data/eibis/index.htm.
[13] For further information on the methodology see: Delanote and Wruuck (2021), *Regional Cohesion in Europe 2020-2021: Insights from the EIB Investment Survey*, European Investment Bank, Luxembourg; available at this link: https://www.eib.org/attachments/publications/eibis_2020_regional_cohesion_en.pdf.
[14] Based on EIBIS 2020, available at this link: https://www.eib.org/en/publications/econ-eibis-2020-eu.

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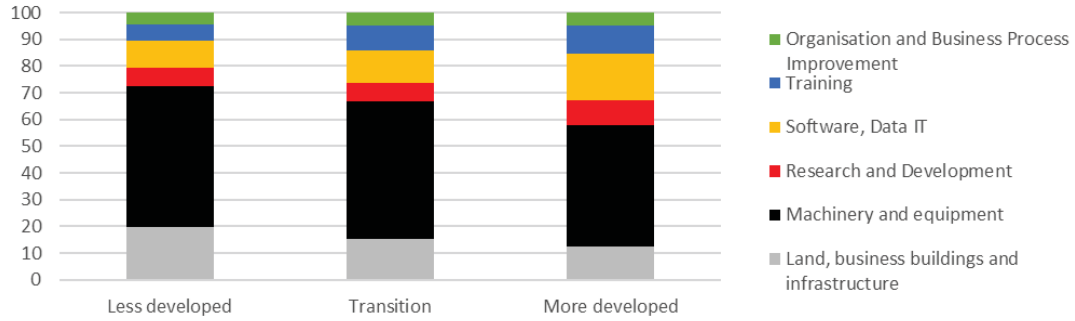
part of recovery strategies to mitigate risks of rising territorial and social divergences, looking ahead.

Figure 2-17: Composition of investments (in %), by level of development



The results cover all firms who have invested in the last financial year (excluding "don't know" and refused responses). The results concern replies to the survey question: "In the last financial year, how much did your business invest in each of the following with the intention of maintaining or increasing your company's future earnings?"
Source: EIBIS 2021

2.4.2 Firm dynamics in EU regions

In 2018, the number of firms[15] with at least one employee – termed 'employer firms' here – was largest relative to population in Greece, Cyprus, Luxembourg, Slovenia (for which only national data are available) and most parts of Hungary and Estonia (Map 2-10). This may reflect a relative absence of large firms. Although the number of firms varies greatly between regions within Member States, the national context appears to be an important factor. In most countries, the number of firms relative to population is highest in the capital metro regions, except for France, Italy, Austria, and Spain. This is in part because many firms, especially large ones, have their headquarters there. The headquarter function also contributes to the higher number of employees per firm in the capital metro region[16]. In general, non-metro regions tend to have fewer employer firms per inhabitant than metro regions.

Firms may locate in more urbanised areas to benefit from agglomeration economies, from 'matching', 'sharing' and 'learning' (Duranton and Puga, 2020). Cities tend to have larger labour markets, allowing better matching between labour demand and supply, and enable better sharing of inputs and infrastructure, while the fact that people work and live in close proximity facilitates learning from each other.

[15] All firms in the business economy, as defined by NACE Rev.2, are covered, except insurance activities of holding companies (sector K642).

[16] Some caution is needed in interpreting this result. Some large enterprises may be composed of multiple local units, located in different regions, but with their employment registered in the head office often located in the capital city. This may inflate the number of employees counted as working there.

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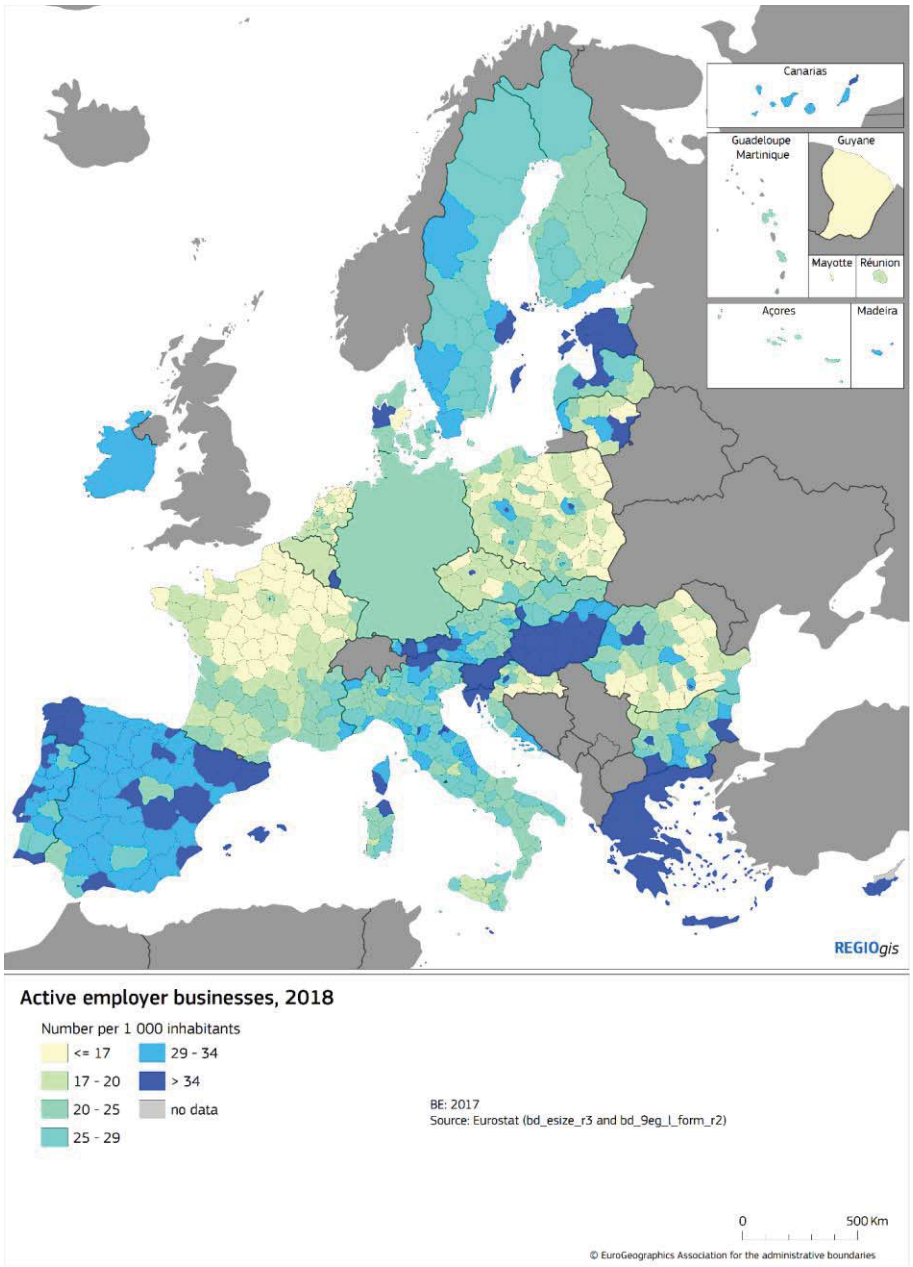
Map 2-10: Active employer businesses per 1000 inhabitants, 2018



Business demography Statistics

Employer Business Demography Statistics at regional level show where firms (with at least one employee) are located in the EU and their dynamics in terms of births, deaths and growth. This section examines indicators of the number of firms relative to population, employees per firm, firm birth rates (firms created relative to population), firm death rates (closures relative to population), and the proportion of 'high growth' firms (defined here as firms with at least 10 persons employed growing by over 10% a year over a three-year period).

For more details see: http://ec.europa.eu/eurostat/statistics-explained/index.php/Structural_business_statistics_at_regional_level

New enterprise creation is one of the main drivers of economic development and employment creation. New firms can help to open new sectors and higher value-added markets, so contributing to the structural transformation of an economy (Dent et al., 2016). They may also help to increase competitiveness by pushing incumbent enterprises to become more efficient.

In 2018, the number of newly-created employer firms relative to population tended to be higher in capital metro regions in both more developed and less developed Member States, with birth rates in Budapest and Tallinn being particularly high (Figure 2-18). Paris, Rome and Madrid are exceptions, birth rates being lower than in other metro regions in the countries concerned. In many sectors, firms operating in metro regions tend to face more competition because of the larger market and so a greater risk of being forced out of business if they are uncompetitive (Melitz and Ottaviano, 2008; Combes et al., 2012). High death rates, therefore, often go with high birth rates, as in Budapest and Tallinn, though death rates tend to be lower than birth rates, particularly in metro regions[17].

High growth enterprises[18] play an important role in the economic growth of cities and regions through their contribution to productivity and innovation (Acs et al., 2008). In 2018, capital metro regions typically had the highest number of high growth firms per head. The only exceptions were Lisbon, Amsterdam, Rome, Paris and Vienna, but even there the number was still above the country average (Figure 2-19). In all Member States, the number was higher in metro regions than non-metro regions.

[17] This may reflect the fact that firms can cease operating without being formally closed down.

[18] High-growth enterprises are those which had at least 10 persons employed at the beginning of the period and where employment increased by over 10% a year over the subsequent three years.

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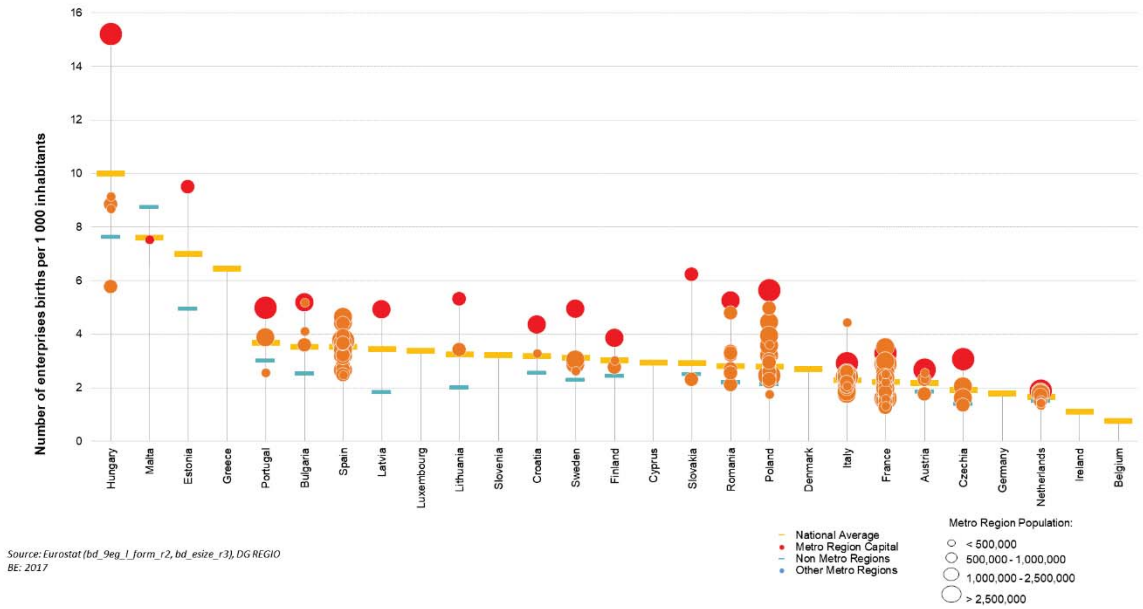
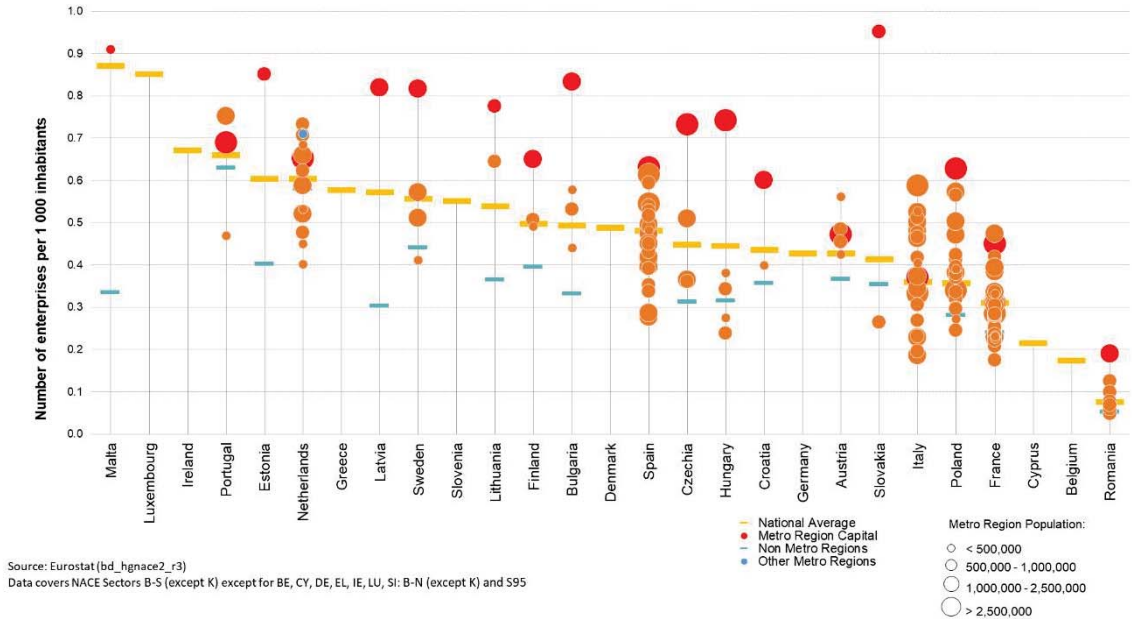
Figure 2-18: Employer firm birth rates by type of region, 2018



BE: 2017
Source: Eurostat [bd_esize_r3], DG REGIO calculations

Figure 2-19: Number of high growth firms by type of region, 2018



Data covers NACE sectors B-S (except K), apart from BE, CY, DE, EL, IE, LU, and SI, where they cover B-N (except K) and S95.
Source: Eurostat [bd_hgnace2_r3], DG REGIO calculations

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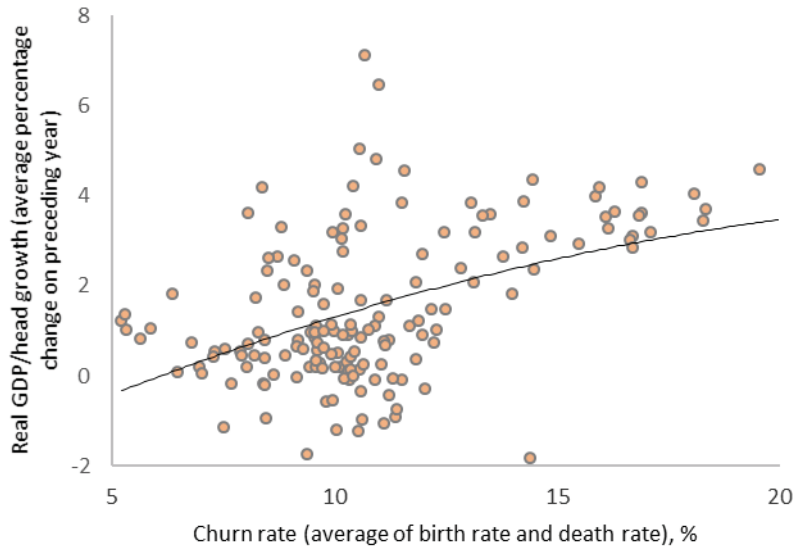
Creative destruction and GDP growth in EU regions

The economic concept of creative destruction is described by Schumpeter (1942) as "*the process of industrial mutation that continuously revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one*". As a concept it is studied as a possible driver of economic growth, often in an endogenous growth context (see e.g. Aghion and Howitt, 1992). In the literature on firm and employment dynamics, creative destruction is in many cases measured by the average of the rate of firm creation and the rate of firm destruction, also known as the business churn rate.

There is a significant positive relationship between the churn rate and average annual growth rate of real GDP in EU NUTS2 regions over the 2008-2018 period (Figure 2-20), primarily reflecting the fact that nearly all regions with a churn rates above 12% had above average GDP growth[(i)]. Among regions with lower churn rates the relationship is weaker and, indeed, many of these had high growth.

Figure 2-20: Creative destruction and GDP growth in EU regions, 2008-2018



Note: The precise period covered differs between regions because of data gaps for the churn rate.
Source: Eurostat, DG REGIO calculations

[(i)] The single exception is French Guyana, which could be considered an outlier.

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Entrepreneurship is crucial for regional development, but start-ups and 'scale-ups' face particular financing constraints

Start-ups and scale-ups need capital. EU start-ups, however, have more difficulty in obtaining venture capital than their US counterparts. EU scale-ups have even more difficulty to grow and remain independent than US firms. An additional problem is that venture capital is usually concentrated in a few places, often in the capital city.

To boost investment opportunities from venture capital and make funding more accessible to small and innovative enterprises, the Commission in 2016 launched a pan-European Venture Capital Fund-of-Funds under the Start-Up and Scale-Up Initiative (COM(2016)733 final). This complements other financial instruments under the EU programme for the Competitiveness of Enterprises and SMEs (COSME) and Horizon 2020's Innovfin to facilitate SME access to guarantees, loans and equity capital through local financial institutions in the Member States.

To help start-ups and scale-ups, and building on the Single Digital Gateway(1) and existing national and European contact points, the European Commission has set up the Enterprise Europe Network (EEN), which provides 'Scale-up Advisors' in all regions to provide advice to SMEs on relevant national and EU regulations, funding and partnering opportunities and how to participate in cross-border public procurement.

(1) The single digital gateway refers to an initiative to create a single-point of access to the information, administrative procedures and assistance services that individuals and businesses need to become active in another EU country. By the end of 2023 at the latest, users will be able to perform a number of procedures in all EU member states without any physical paperwork, like registering a car or claiming pension benefits.

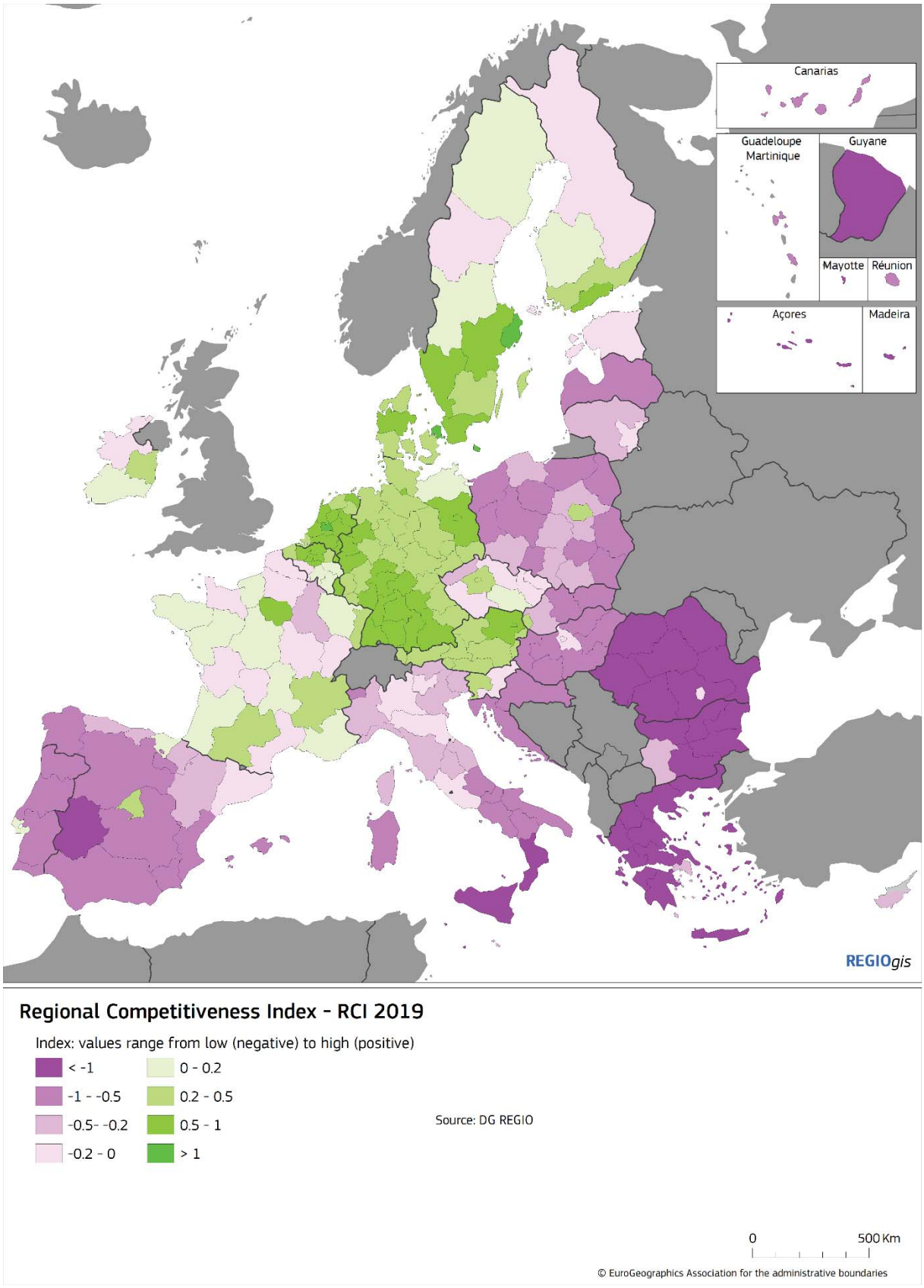
2.4.3 Regional competitiveness in Europe

Regional competitiveness indicates the ability of a region to offer an attractive and sustainable environment for firms and residents to live and work in. Launched in 2010 and updated regularly since, the Regional Competitiveness Index (RCI) is designed to capture the different dimensions of competitiveness for EU NUTS 2 regions[19]. It allows regions to monitor and assess their development over time as compared with other regions[20]. The most recent edition of the RCI was published in 2019. It shows that more than 10 years after the crisis, there is still a clear north-west – south-east divide across the EU (Map 2-11).

[19] See Annoni and Kozovska (2010), Dijkstra, Annoni and Kozovska (2011), Annoni and Dijkstra (2017) and Annoni and Dijkstra (2019)

[20] All RCI editions are built on the same approach as the Global Competitiveness Index of the World Economic Forum.

Map 2-11: Regional Competitiveness Index scores, 2019



In line with previous editions, the 2019 RCI shows a polycentric pattern with strong performance of most capital city regions and others with large cities, which benefit from agglomeration economies, better connectivity and high levels of human capital.

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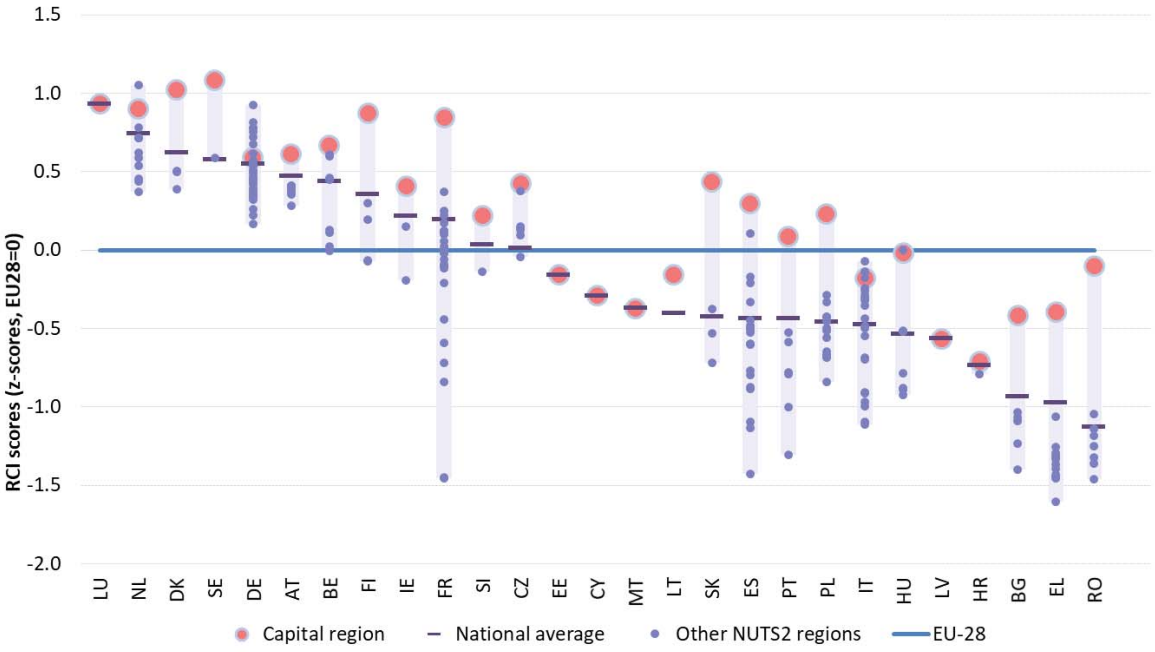
Capital city regions tend to be the most competitive, except in the Netherlands (where the capital city region is ranked second), Italy (where Lombardia is the most competitive region) and Germany (Figure 2-21).

Figure 2-21: Distribution of regional RCI 2019 scores by Member State



Source: DG-REGIO

The gap between the capital city region and others is particularly wide in France, Spain, Portugal and many of the Eastern Member States. This can be a reason for concern as it puts pressure on the capital city region while possibly leaving resources under-used in other regions.

In general, higher levels of GDP per head are associated with higher levels of competitiveness. However, this relationship is stronger at lower levels of GDP – among more prosperous regions there is more variation in competitiveness.

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The Regional Competitiveness Index (RCI) methodology

The 2019 edition of the RCI index is based on a set of 74 indicators selected from 84 candidate indicators (some indicators used in 2016 have been replaced). Most indicator values available span the period 2015-2017, some are for 2018, while a few go back to 2014.

Data comes from a wide variety of sources, including the Quality of Government Index (University of Gothenburg), Worldwide Governance Indicators (World Bank), Global Competitiveness Index (World Economic Forum), various Eurostat indicators, and the Regional Innovation Scoreboard (DG GROW).

Following the same methodology as previous editions, the indicators are grouped into 11 dimensions of competitiveness capturing aspects that are relevant for productivity and long-term development. In turn, these 11 dimensions are organised into three sub-indices: Basic, Efficiency and Innovation. The Basic group includes five pillars: (1) Institutions, (2) Macroeconomic stability, (3) Infrastructure, (4) Health, and (5) Basic education, which are the key drivers for all economies. As a regional economy develops and its competitiveness increases, a more skilled labour force and a more efficient labour market come into play as part of the Efficiency group, which includes three pillars: (6) Higher education, training and lifelong learning, (7) Labour market efficiency and (8) Market size. At the most advanced stage of development, the Innovation group becomes more important, consisting of three pillars: (9) Technological readiness, (10) Business sophistication, and (11) Innovation. Indicator values are normalised as z-scores, i.e. by calculating the difference between the observed score and the mean score across regions and dividing by the standard deviation.

EU regions are divided into five development stages based on their average 2015-2017 GDP per head (in PPS terms) relative to the EU average. The weights attached to the three sub-indices used to calculate the overall RCI differ between stages of development (Table 2-3).

Table 2-2: Weights of the three RCI sub-indices per development stage

Stage of development	Basic sub-index	Efficiency sub-index	Innovation sub-index
Stage 1: GDP index <50	30.00%	50.00%	15.00%
Stage 2: GDP index 50-75	31.25%	50.00%	18.75%
Stage 3: GDP index 75-90	27.50%	50.00%	22.50%
Stage 4: GDP index 90-110	23.75%	50.00%	26.25%
Stage 5: GDP index >= 110	20.00%	50.00%	30.00%

The GDP index is calculated based on the EU average=100
Source: Annoni et al. (2019)

The 2019 RCI tracks the performance of all NUTS 2 regions in EU Member States. As in previous editions, the regions that are part of the same functional urban area are combined, which is the case for 6 capital functional urban areas, i.e. those of Vienna, Brussels, Prague, Berlin, Budapest and Amsterdam.

For further details on the methodology, see Annoni et al. (2019).

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PART 4/16

COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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CHAPTER 3 A Greener, low-carbon Europe – PART 1

- The EU has adopted the European Green Deal with the goal to make the EU economy climate-neutral by 2050. This will require a rapid reduction of greenhouse gas (GHG) emissions, more investments in green technologies and protecting the natural environment.
- GHG emissions dropped by 24% between 1990 and 2019. This suggests the EU will meet its 2020 target of reducing GHG emissions by 20%. The new 2030 target as part of the 'Fit for 55' is a reduction of 55%. This will imply large reductions in emissions both within and outside the emissions trading scheme.
- Energy consumption has decreased significantly in the EU over the past decades. Nevertheless, the latest figures indicate that the 2020 energy efficiency target will be missed. The 2030 target is more ambitious and will require additional efforts.
- Renewable energy consumption in the EU rose steadily from 11% in 2006 to 19% in 2018, close to its 2020 target of 20%, but some Member States are lagging behind their 2020 national targets. The target of 40% by 2030 will require combined efforts for boosting production of renewable energy and reducing total energy consumption.
- Climate change affects a growing number of EU regions but the impact differs depending on their geography and the structure of their economy. Sectors such as tourism and agriculture are likely to be particularly affected.
- Only 40% of EU water bodies are in a good ecological state. Despite significant progress, several rural areas and less developed regions still need important investment in waste water treatment.
- The share of waste recovered increased from 46% in 2004 to 54% in 2018 in the EU. This helps to protect environment, recycle raw materials and recover energy. Nevertheless, recycling and incineration with energy recovery remain low in several Member States.
- The emissions of most major air pollutants have significantly shrunk in the EU. Exposure to air pollutants, however, is still high in many cities. One out of three city residents lives in a city where at least one of the air pollution thresholds is exceeded.
- Biodiversity loss and the degradation of ecosystem services continue in the EU across terrestrial, freshwater and marine ecosystems. Protecting and restoring biodiversity can help to improve the flow of ecosystem services and to mitigate climate change and its impacts. For example, investing in urban vegetation or wetlands can reduce the impact of heat waves and floods, provide more habitat for endangered species, reduce air and noise pollution and provide spaces for leisure, thus improving urban quality of life. In rural areas, fostering high-diversity landscapes can increase ecological connectivity and help species to adapt to climate change, while at the same time enhancing ecosystem services such as pollination, climate and water regulation, and erosion protection.

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3.1 Introduction

Recent extreme events such as deadly flooding in Germany and Belgium or uncontrollable forest fires in Greece illustrate the challenges faced by the EU in tackling the consequences of climate change. According to the last report from the Intergovernmental Panel on Climate Change (IPCC), almost the entire 1.1 degrees C of warming since the pre-industrial era is due to human activity[1]. The IPCC gives a 50% chance that a 1.5 degrees C warming could be reached before 2040. As a result, the negative impacts of climate change will become more frequent and more severe and all regions in the EU will be affected.

At the same time, the world is facing a massive extinction episode. This translates into a rapid fall in biodiversity which affects all parts of the world. At present, one million of the eight million species known on the planet are at risk of being lost due to the impact of human activities, including land and sea use changes, over-harvesting, climate change, pollution and invasive alien species. Biodiversity loss due to human pressures continues also in the EU, undermining the capacity of ecosystems to deliver benefits to humans. Yet, the quality of our environment is essential to human wellbeing and to maintain the provision of key ecosystem services such as climate regulation, flood protection, air and water quality, soil fertility, pollination and the production of food, fuel, fibre and medicines.

This chapter looks at the main trends related to climate change and environment. It assesses the extent to which the EU has or has not reached some of its key policy targets in the area. It also analyses how and to what extent EU regions are affected by the consequences of climate change and how they perform in preserving the quality of their environment.

3.2 EU climate action and the European Green Deal

Climate change and environmental degradation are the most challenging threats to living conditions in Europe and, indeed, in the world as a whole. In response, the EU has adopted the European Green Deal, a new growth strategy, with ambitious targets for resource-efficiency, competitiveness, greenhouse gas (GHG) emissions and inclusiveness. The goal is to make the EU economy and society climate-neutral by 2050 by cutting emissions, investing in green technologies and protecting the natural environment. A European Climate Law has been proposed by the Commission to make the goal legally binding[2].

Over the past decades, the EU has adopted a series of targets for GHG emissions, energy efficiency and the share of renewables in energy consumption with the aim of achieving the transformation to a low carbon economy. The EU key targets were set in following frameworks:

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1 IPCC (2021), "Climate Change 2021 – The Physical Science Basis", Working Group I contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press.

2 COM/2020/80 final - Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law).

- The 2020 climate and energy package adopted in 2007 and which aimed at a 20% cut in GHG emissions (from 1990 levels), a 20% share of renewables in energy consumption and a 20% improvement in energy efficiency by 2020;
- the 2030 climate and energy framework adopted in 2014 which upgraded the 2020 targets to respectively 40%, 32% and 32.5%;
- the European Green Deal, in which the Commission proposed an update of the 2030 target for reducing GHG emissions by 55% and raise the targets relative to renewables and energy efficiency to 40% and 36% respectively;
- the 2050 long-term strategy aiming at making the EU climate-neutral by 2050.

Table 3-1 summarises the most recent steps taken by the EU in setting climate and energy targets.

Table 3-1 Key EU climate and energy targets

Target time timeline	2020	2030	2030	2050
Policy framework	2020 Climate and Energy Package	2030 Climate and Energy Framework	EU Climate Law and Fit for 55	EU Climate Law and Fit for 55
Year of adoption	2007	2014	2021	2021
Targets				
GHG emissions reduction	20%	40%	55%	Net zero GHG emissions
Share of renewables in energy consumption	20%	32%	40%	NA
Increase in energy efficiency	20%	32.5%	36-39%%	NA

In July 2021, the European Commission adopted a series of legislative proposals setting out how it intends to achieve climate neutrality in the EU by 2050, including the intermediate target of an at least 55% net reduction in greenhouse gas emissions by 2030. The so-called 'Fit for 55' package combines the application of emissions trading to new sectors and a tightening of the existing EU Emissions Trading System, accelerating the use of renewable energy and greater energy efficiency, a faster roll-out of low emission transport modes, an alignment of taxation policies with the European Green Deal objectives, measures to prevent carbon leakage and tools to preserve and grow the EU's natural carbon sinks. At the same time, a more transparent and dynamic governance process has been set up to help meet the 2030 targets and the EU's international commitments under the Paris Agreement, involving an integrated monitoring system and reporting rules.

For these plans to succeed, action in all parts of the EU economy is needed, notably investment in environmentally-friendly technologies, targeted R&D and innovation, cleaner, cheaper and healthier forms of private and public transport, decarbonisation of the energy sector and improvements in the energy efficiency of buildings.

3.2.1 Reducing greenhouse gas emissions

Under the 2020 climate and energy package [3], the EU committed to reducing GHG emissions by 20% by 2020 relative to 1990. The pursuit of this objective was supported by two instruments, the EU Emissions Trading System (ETS) and the Effort Sharing Decision (ESD).

The ETS is a market based tool for cutting emissions from large-scale power and industrial plants and aviation. It covers around 45% of EU total emissions and the target at the time was to reduce these emissions by 21% below the 2005 level by 2020. The ESD covers sectors not included in the EU ETS, such as transport, buildings, agriculture (non-CO2 emissions) and waste, which account for around 55% of EU emissions. Member States have committed to national 2020 targets, set according to their levels of development – from a 20% cut for the most developed countries to a maximum increase of 20% for the least developed relative to 2005. The ESD objective is to reduce emissions in the sectors it covers by 10%.

According to the latest figures available, the EU is likely to have met its 2020 target. Between 1990 and 2019, GHG emissions were reduced by 24%, while EU GDP grew by around 60%. Accordingly, the GHG emission intensity of the economy, defined as emissions relative to GDP, fell to less than half of the 1990 level[4]. EU-27 emissions covered by the ESD were 10% lower in 2019 than in 2005, so the 2020 target is likely to have been achieved.

In 2014, the EU has enacted legislation to reduce emissions by at least 40% by 2030. National emission targets for ESD sectors have been revised to achieve a reduction of 30% by 2030 relative to 2005. These targets, enshrined in the Effort Sharing Regulation[5], range from a reduction of 0 to 40%. Although all Member States have committed to not increasing emissions from their ESD sectors, they have risen in Malta, Latvia, Lithuania and Poland (Figure 3-1)[6].

In 2018, levels of ESD emissions were lower than the 2030 target only in Greece, Hungary and Croatia and were well above it in a number of countries, either because the target was set at a high level (as in Luxembourg, Finland, Germany, and Belgium - a cut of 35% or more in all cases) or because emissions have been reduced only slightly (as in Ireland) or have increased (as in Bulgaria, Latvia, Lithuania , Malta and Poland).

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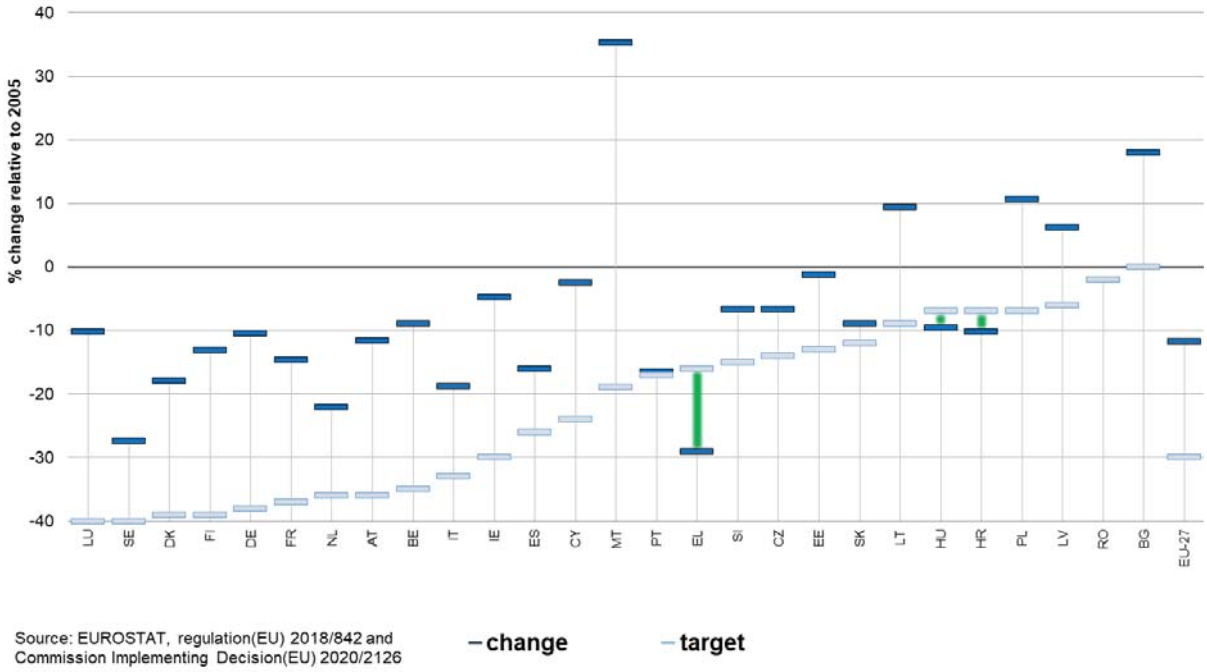
[3] The 2020 climate and energy package is a set of binding legislation to ensure the EU meets its climate and energy targets for 2020. The targets were set by EU leaders in 2007 and enacted in legislation in 2009. They are also the headline targets of the Europe 2020 strategy for smart, sustainable and inclusive growth.

[4] European Commission (2020), EU Climate Action Progress Report 2020.

[5] REGULATION (EU) 2018/842 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018; https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0842&from=EN.

[6] The national targets under the ESD should be revised in the context of the 'Fit for 55' package but they have not been set yet.

Figure 3-1 Change in greenhouse gas emissions outside the Emissions Trading Scheme, 2005-2018 and Europe 2030 targets



Source: Source: EUROSTAT, regulation(EU) 2018/842 and Commission Implementing Decision (EU) 2020/2126. Member States with actual changes above their target are highlighted.

Under the European Green Deal, as noted above, the EU launched the 2030 Climate Target Plan under which it set a more ambitious target of cutting emissions by at least 55% below 1990 levels by 2030, instead of 40%, on the way to becoming climate neutral by 2050.

GHG emissions per head vary substantially within countries. This is notably the case in Spain, Portugal, Germany, Greece, Bulgaria and Poland, where some regions are emission hotspots (Map 3-1)[7]. Many factors can explain differences in high emission levels, including, in particular, the level and composition of economic activity, the energy efficiency of production plants and buildings and the use of renewable energy as well as land use, climate and geography[8].

---

7 The figures are based on the EDGAR (Emissions Database for Global Atmospheric Research) database, which provides emission data and grid maps for all countries from 1970 to 2015 (2018 for CO_2), for both air pollutants and greenhouse gases, calculated in a consistent way to be comparable between countries. In order to estimate CO2 emissions, EDGAR uses international activity data (mainly energy balance statistics from IEA (2017), IEA CO2 emissions by main fuel type and BP statistics), emission factors from various technological databases and proxies to estimate the regional location of emissions . Because of differences in methodology, the figures do not always match official estimates provided by Member States at national level.

8 Crippa, M., Oreggioni, G., Guizzardi, D., Muntean, M., Schaaf, E., Lo Vullo, E., Solazzo, E., Monforti-Ferrario, F., Olivier, J.G.J. and Vignati, E. (2019), "Fossil CO2 and GHG emissions of all world countries - 2019 Report", EUR 29849 EN, Publications Office of the European Union, Luxembourg, doi:10.2760/687800, JRC117610 - https://edgar.jrc.ec.europa.eu/overview.php?v=50_GHG.

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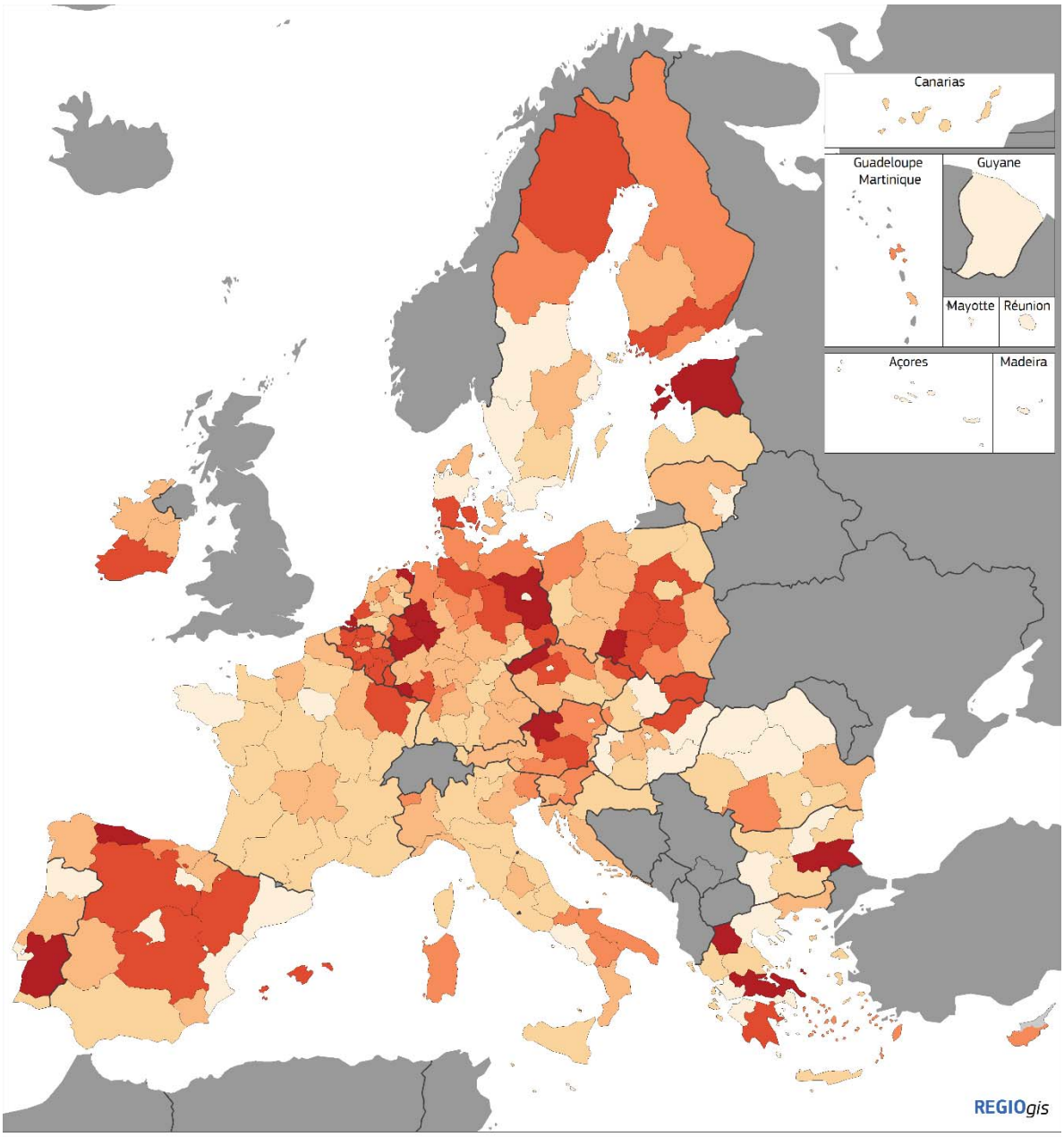
Map 3-1 CO2 emissions from fossil fuels per head, NUTS2, 2018



CO2 emissions from fossil fuels per head, 2018

tCO2 per head

- <= 4.5
- 4.5 - 6.0
- 6.0 - 8.0
- 8.0 - 10.0
- 10.0 - 15.0
- > 15.0

EU-27 = 7.2
Source: Crippa e.a. (2019)

0 500 km

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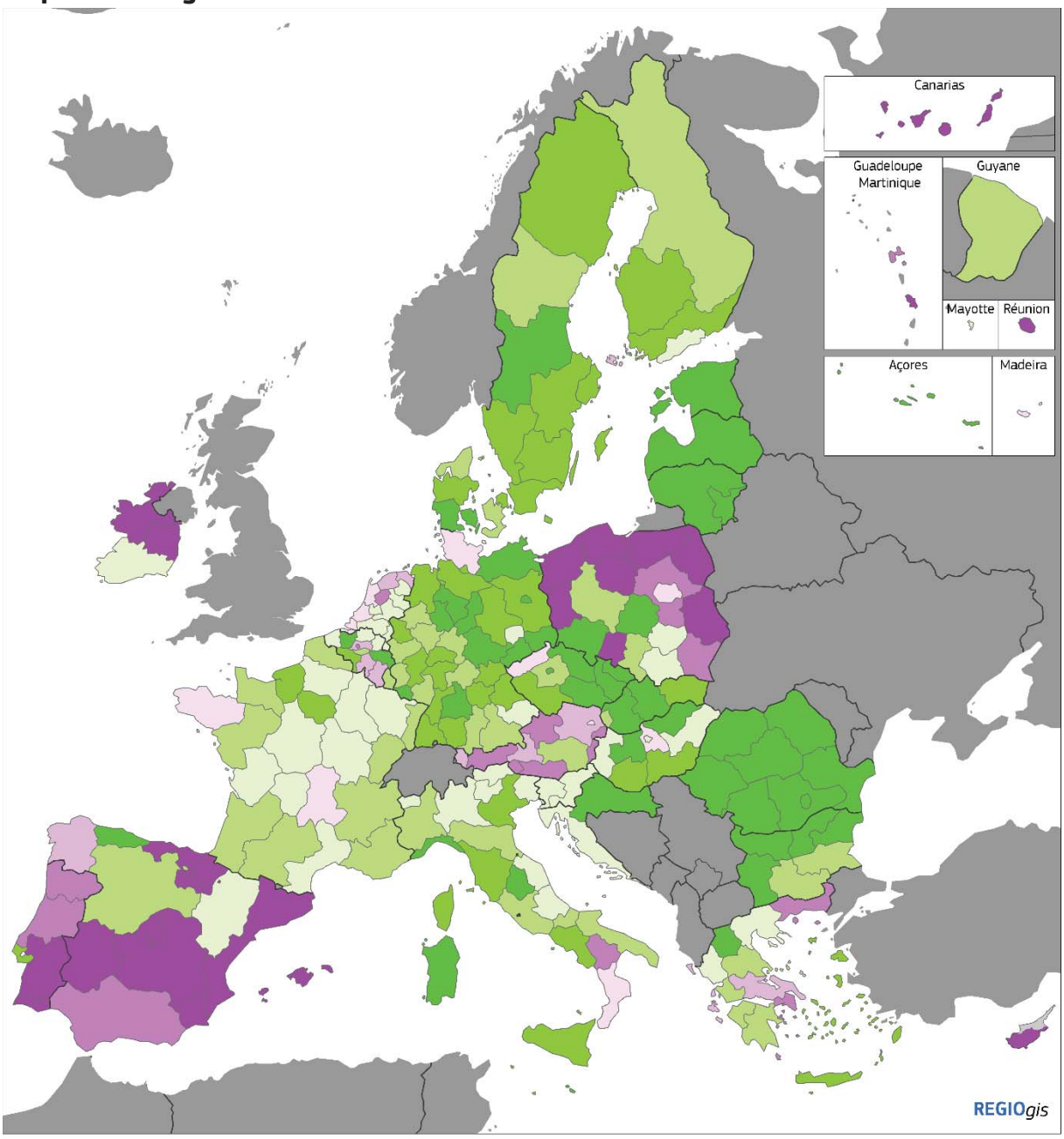
Map 3-2 Change in total CO2 emissions from fossil fuels between 1990 and 2018



Change in total CO2 emissions from fossil fuels between 1990 and 2018

%

< -30	0 - 10
-30 - -20	10 - 20
-20 - -10	20 - 30
-10 - 0	>30

Source: JRC-EDGAR gridded CO2 data

0 500 km

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Between 1990 and 2018, GHG emissions were reduced in most EU regions but they significantly increased in some of them, notably in Cyprus, Ireland, Spain and Poland where they soared by more than 30% (Map 3-2).

Box 3-1 Employment in EU ETS installations

The EU Emissions Trading Scheme (ETS) was launched in 2005 and it is the world's biggest greenhouse gas trading programme, covering around 14,000 factories in the EU-27, power stations and other companies in the EU, most of them being highly energy-intensive installations. The key principle of the ETS is to set a total annual quantity of GHG (measured in CO2 equivalent) and sell it by auction to the installations involved.

The geographical distribution of the ETS installations among EU NUTS 2 regions is very heterogeneous. A recent study on employment in ETS installations[9] estimates that employment in ETS installations corresponds to around 1% of the EU-27 total employment but with some regional variations (Map 3-3). In 2018, persons employed in the EU ETS installations constituted more than 3% of total employment in seven NUTS 2 regions, peaking at 4.1% in Közép-Dunántúl (Hungary). At NUTS 3 level, the share of employment in ETS installations exceeds 10% in three regions, with a maximum at 14% in Gotlands län (Sweden). Five out of the top 10 regions are located in Germany.

There has been a concern that the ETS adds costs to companies, implies loss in competitiveness and encourages relocation of activities in places where environmental regulations are less stringent. However, an increase in the price of carbon can lead to a variety of different responses from industry apart from reducing activities and/or employment, such as improving energy efficiency, changing the type of energy used, adapting technology, or innovate.

This is confirmed by a number of studies on the impact of the EU ETS on firms performance and on employment which generally conclude (i) that the EU ETS offers competitive advantages compared to alternative regulatory scenarios and (ii) the EU ETS has so far not had any statistically significant impact on regulated firms' number of employees and profit. Instead, the EU ETS induced regulated companies to increase investment, notably in carbon-saving technologies (see for instance Abrell et al., 2011 or Dechezleprêtre et al., 2018[10]).

9 European Commission (2021), "European Emissions Trading System (ETS) – Calculations on the regional employment impact of ETS installations, Analytical and methodological report", Luxembourg: Publications Office of the European Union.

10 Abrell, J., Ndoye Faye, A. and Zachmann, G. (2011), "Assessing the impact of the EU EST using firm level data", Bruegel Working Paper 2011/08; Dechezleprêtre, A., Nachtigall, D. and Venmans, F. (2018), "The joint impact of the European Union emissions trading system on carbon emissions and economic performance", OECD Economics Department Working Papers No. 1515.

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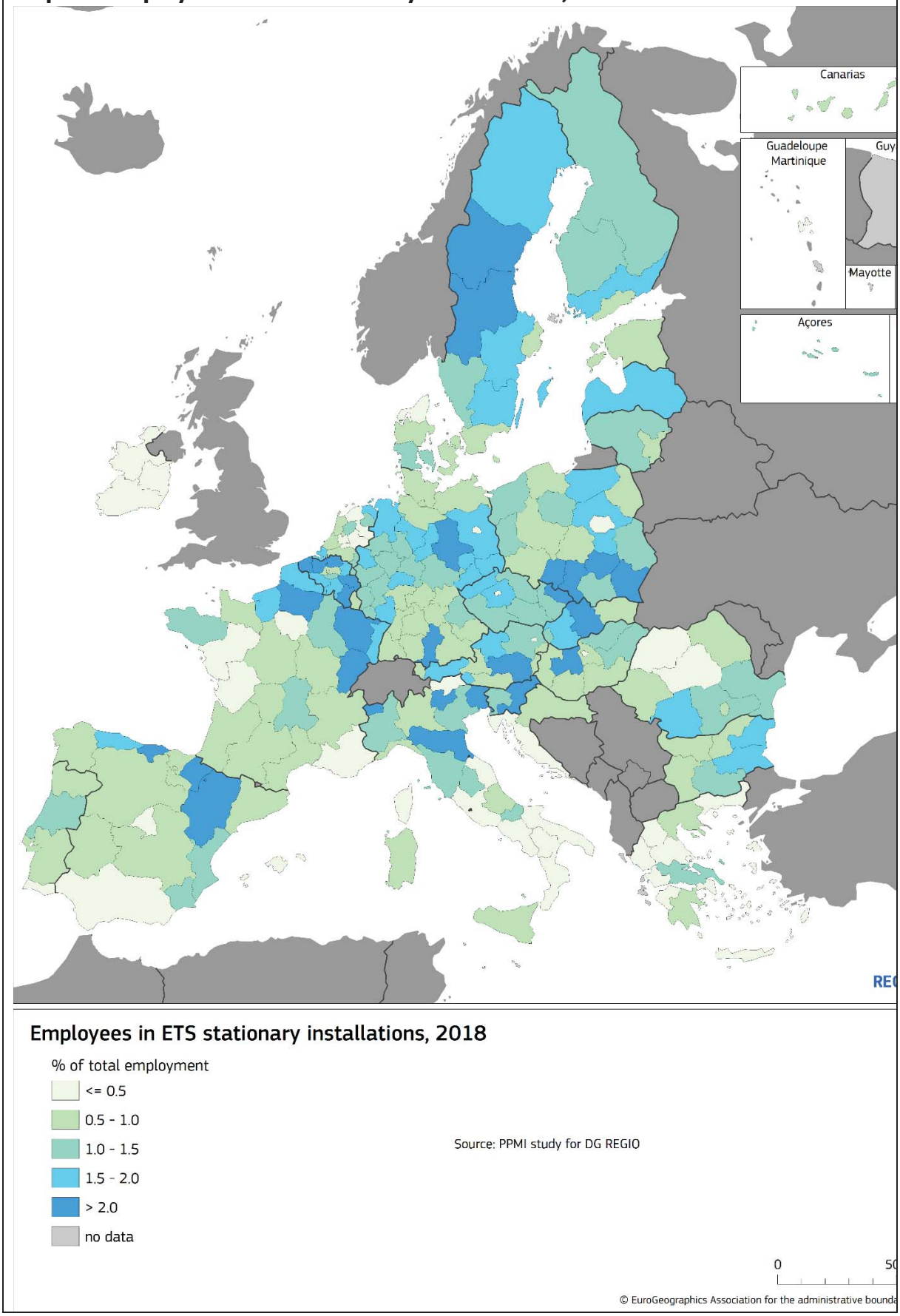
Map 3-3 Employees in ETS stationary installations, 2018



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3.2.2 Increasing energy efficiency

Increasing energy efficiency is key to protecting the environment, reducing GHG emissions and improving the quality of life. The EU has set ambitious targets for 2020 and 2030, focusing on the sectors where the potential for savings is the greatest, such as buildings.

As part of the 2020 climate and energy package, the objective set in 2007 was to improve energy efficiency by 20% by 2020[11] compared to the projections made at that time. To achieve this objective, Member States were asked to set their own indicative national energy efficiency targets[12].

In 2018, the Energy Efficiency Directive[13] was amended to establish a target for 2030 of reducing EU energy consumption by at least 32.5%[14]. A reduction in energy consumption, however, does not necessarily signify an improvement in energy efficiency. The main determinants of energy use are GDP growth and the share of manufacturing in the economy. Changes in energy consumption, therefore, reflect not only changes in energy efficiency but also fluctuations in economic activity as well as changes in the structure of the economy.

In 2019, primary and final energy consumption[15] had decreased by 9.7% and 5.5% respectively compared to their 2005 levels. However, primary and final energy consumption levels were respectively 3.0% and 2.6% above the 2020 targets and 19.9% and 16.3% above the 2030 targets. It is therefore likely that the EU will miss its 2020 targets while it is still far from the 2030 targets, implying a need for additional efforts to make the EU economy more energy efficient.

Progress in reducing energy use varies markedly between Member States. In 2018, only 11 of the 27 Member States had lowered primary energy consumption below their 2020 target and only 9 had reduced final consumption below the target. In a number of Member States, the reduction required to meet the targets was still considerable (Cyprus, Malta, Bulgaria and France in respect of primary energy consumption and Lithuania, Hungary, Malta and Slovakia in respect of final consumption) (Figure 3-2).

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11 The 20% energy efficiency target was enacted in legislation with the adoption of the Energy Efficiency Directive 2012/27/EU in 2012.

12 DIRECTIVE 2012/27/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2012 on energy efficiency. Member States targets are included in their National Action Plan and Annual Progress Report (https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/national-energy-efficiency-action-plans_en?redir=1). With the withdrawal of the United Kingdom, the Union's energy consumption figures for 2020 and 2030 were adjusted to the situation of 27 Member States.

13 Energy Efficiency Directive 2018/2002.

14 The 'Fit for 55' package has set the EU target at 36% but as for the ESD, national targets have not been set yet.

15 Primary energy consumption measures total domestic energy demand, while final energy consumption refers to what end users actually consume. The difference relates mainly to what the energy sector needs itself and to transformation and distribution losses.

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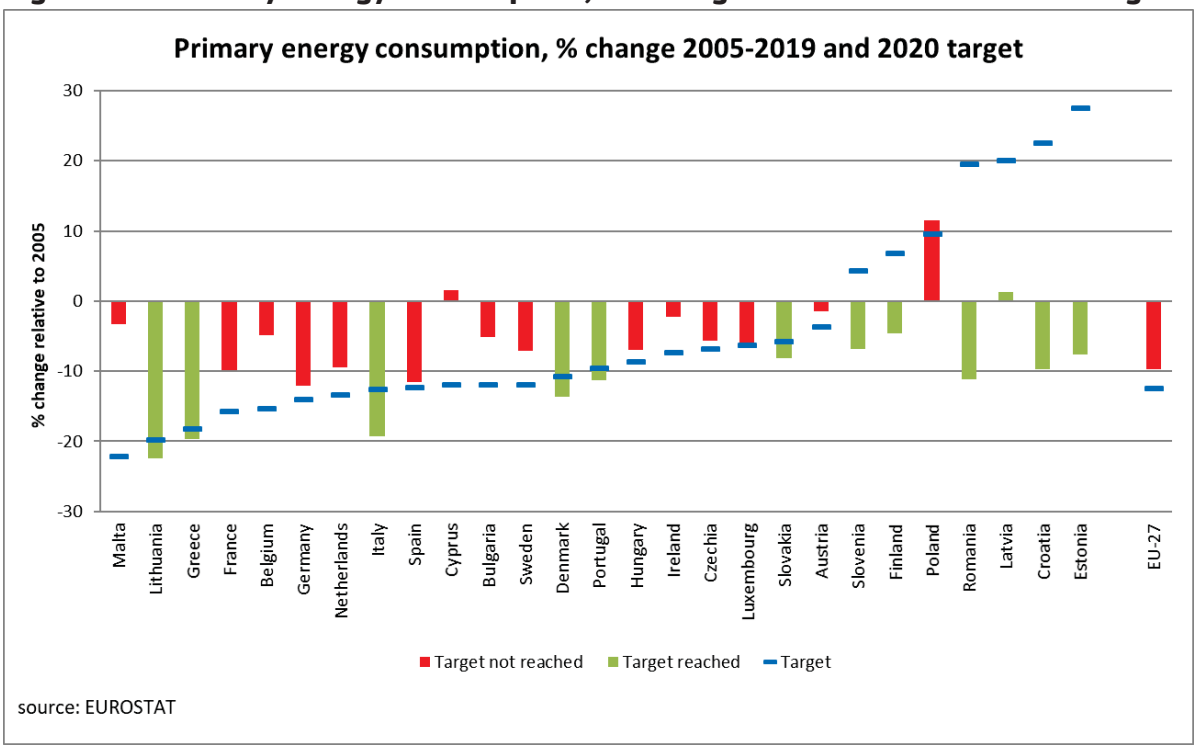
Figure 3-2 Primary energy consumption, % change 2005-2019 and 2020 target



Source: EUROSTAT.

3.2.3 Boosting renewable energy

Renewable sources play an increasing role in the production of energy in the EU. The share of renewables in gross final consumption of energy in the EU rose steadily from 11% in 2006 to 19% in 2018. In the 2020 climate and energy package of 2007, the objective was to raise this share to at least 20% by 2020, with a 10% share of renewables in transport. EU Member States have committed to meeting binding national targets for the share of renewables in energy consumption under the Renewable Energy Directive[16] of 2009. These range from 10% in Malta to 49% in Sweden.

The 2030 climate and energy framework of 2014 set the target of reaching a share of 32% of renewables in energy consumption by 2030 but, as part of the 'Fit for 55' package, the Commission has proposed to increase this target to 40%[17]. For this target to be reached, the share of renewables would have to double compared to levels of 2018.

The share of renewables in energy consumption varies substantially across the EU. In 2018, it was over 40% in Finland and Latvia and close to 55% in Sweden (Figure 3-3). It is much smaller in other countries – below 10% in Malta, Luxemburg, Belgium and the Netherlands –

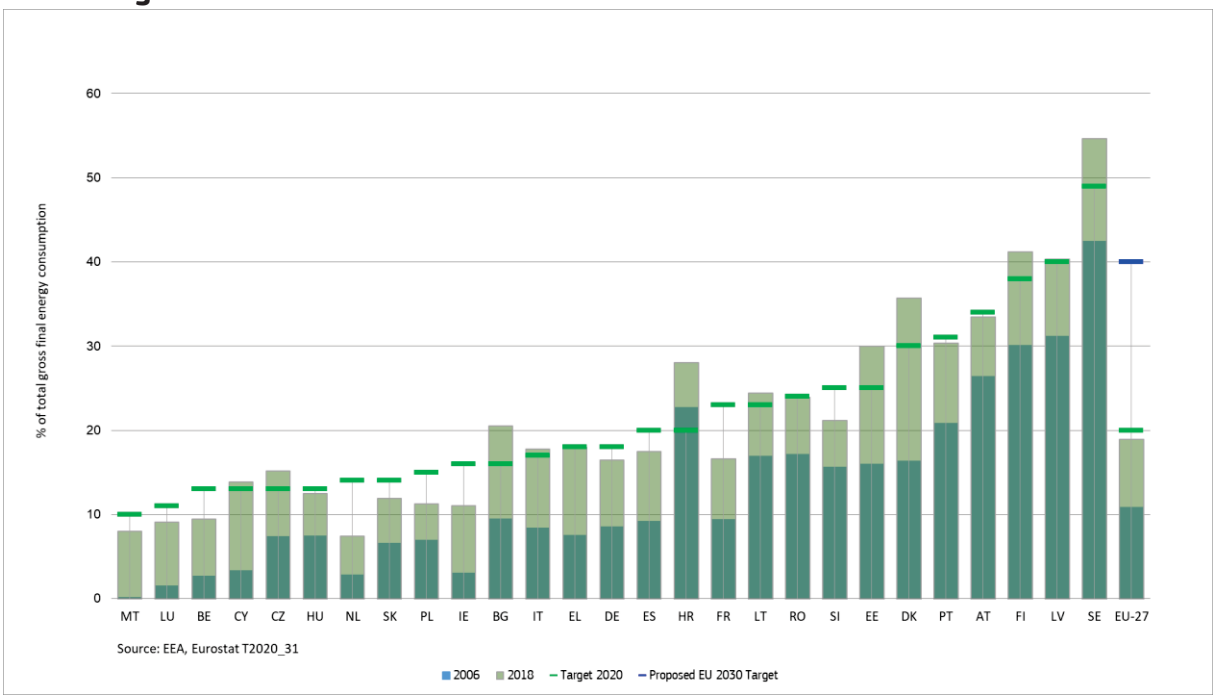
[16] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

[17] To reach the 2030 target, the overall binding target of 40% of renewables in the EU energy mix will be complemented by indicative national contributions, showing what each Member State should contribute to reach the collective target (COM(2021) 550 final).

though it has increased significantly in recent years. In 2018, 13 Member States had reached their national target set for 2020, Sweden, Estonia and Denmark exceeding it by over 5 percentage points. At the same time , some countries are still far from their target, like Belgium, France and Ireland where the share of renewables in 2018 was still less than 75% of the national 2020 target. For the Netherlands to meet their target, the share of renewables would need to have almost doubled between 2018 and 2020.

The capacity to produce renewable energy is closely linked to the geography of countries and regions. The production of wind energy is easier in coastal regions, like those of north-western Europe and Baltic Seas, the Atlantic and some Mediterranean coasts. The production of hydroelectricity requires suitable geo-physical features, while the potential for solar energy production is higher in southern European regions where there are many more days of sunshine. For instance, in 2018, the photovoltaic (solar panel) capacity per head in the EU was largest in Germany (590 watts per inhabitant), followed by the Netherlands (401) and Belgium (394)[18]. In Spain (197 watts per inhabitant) and Portugal (88), it was much less despite the potential production of electricity by this means being among the highest in the EU.

Figure 3-3 Share of renewables in gross final energy consumption, 2006, 2018 and 2020 target



Source: EEA, EUROSTAT T2020_31.

[18] EUOBSERV'ER, Photovoltaic barometer, April 2020.

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Box 3-2 Coal regions in transition

The deployment of renewable energy sources can be an opportunity for many regions. This is notably the case for Coal Regions in Transition[19] (CRiT), which could facilitate energy transition and support post-mining communities through the jobs induced by the installation of renewable energy production capacities. According to recent research by the Joint Research Centre (JRC), up to 315 000 jobs could be created in the coal regions by 2030 by deploying renewable energy technologies as projected in the EUCO3232.5 energy scenario[20]. Around 200 000 additional full time equivalent jobs a year could be created if the potential for energy efficiency in residential buildings were realised[21].

Transition opportunities vary between regions (Map 3-4). In the majority of CRiTs in the EU, clean energy and energy efficiency technologies could trigger significantly higher employment than in their coal industry at present, while in a number of others, potential employment with such technologies is similar to that in their coal industry.

In Map 3-4, regions are grouped as follows:

- 17 regions with High Decarbonising Employment Potential (HDEP): where potential employment in RES- sectors is currently comparable to coal-related jobs. Future decarbonisation will result in the latter being exceeded, though support may be needed to realise the potential identified fully.
- 7 regions with Slow Decarbonising Employment Potential (SDEP) which can potentially develop decarbonising sectors to compensate for the loss of coal-related jobs. The pace of change estimated in the EUCO3232.5 scenario could generate transitionary imbalances., so that support might be needed to accelerate the development of these sectors.
- 7 regions with restricted decarbonising employment potential (RDEP):which under the EUCO3232.5 scenario do not develop employment in decarbonising sectors to a level similar to existing coal-related jobs. Support might be needed to mobilise untapped potential or to promote alternative employment options.

[19] The JRC has identified the European CRiTs that will be affected by the reduction in coal mining and coal powered-plant activities, estimating that more than 200 000 jobs may be at risk. See P. Alves Dias et al. (2018), "EU coal regions: opportunities and challenges ahead", JRC Science for Policy Report, Publications Office of the European Union, Luxembourg. doi: 10.2760/064809.

[20] In order to estimate the potential impact of the EU's climate and energy targets for 2030, the Commission has developed a set of scenarios, the EUCO scenarios. The most recent scenario. EUCO3232.5, models the impact of achieving the target for improving energy efficiency by 32.5% and the target for the share of renewables in energy consumption of 32%, as agreed in the "Clean energy for all Europeans package". This scenario was used to support the Commission's June 2019 assessment of the draft national energy and climate plans (NECPs), submitted by Member States.

[21] The analysis considers various types of job created in terms of their nature and duration. The jobs relating to operations and maintenance are assumed to last 15 years from the installation date, those relating to the manufacturing of the equipment one year (that before the installation) and those associated with installation also one year (that of the installation).

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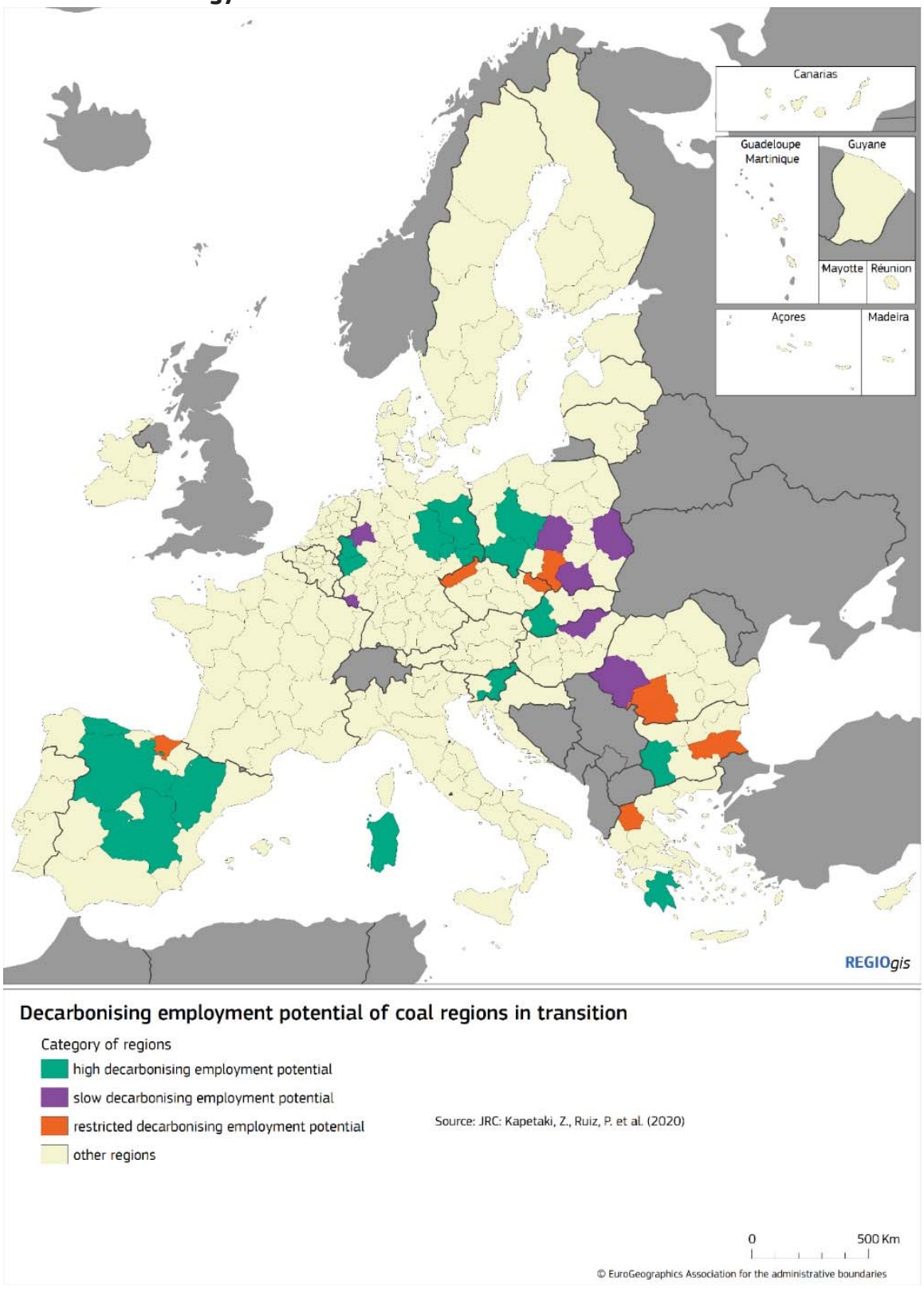
Map 3-4 Decarbonizing employment potential in coal regions under the EUC03232.5 energy scenario



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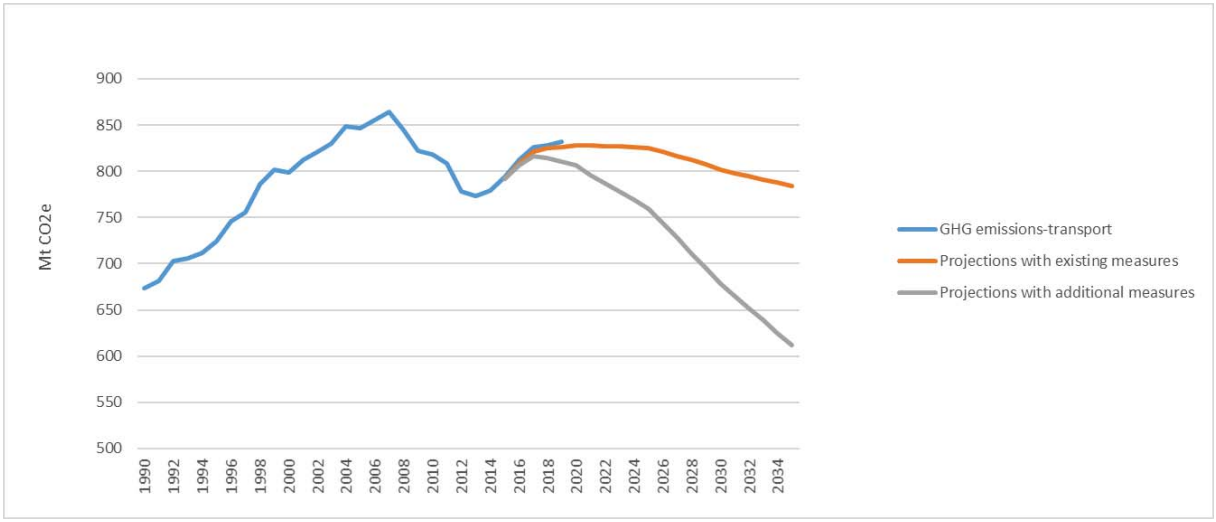
3.2.4 Achieving low-carbon transport

After a sharp drop between 2008 and 2014 as a consequence of the 2008 economic crisis, GHG emissions from transport in the EU increased from 2014 to 2019 at rates similar to those in the period 1990-2008, just under 2% a year[22] (Figure 3-4). This implies that transport has not followed the general tendency for GHG emissions to decline in recent years. Its contribution to overall GHG emissions in the EU has therefore become more significant.

Projections suggest that GHG emissions from transport will decline relatively little over the next few years and will remain higher than in 1990, even with measures currently planned in Member States. Further action is therefore needed, particularly in road transport but also in aviation and shipping where demand is pushing emissions up in both absolute and relative terms. Emission reduction in all transport sub-sectors will need to be much more ambitious if the sector as a whole is to contribute its fair share to the goals set out in the European Green Deal.

Figure 3-4 GHG emissions in transport 1990 to 2019 and projections to 2035[23], Metric tons of carbon dioxide equivalent (MtCO2e), EU-27



Source: EEA.

The new EU Strategy on Sustainable and Smart Mobility[24] includes measures aimed at significantly reducing CO2 and polluting emissions in all modes of transport with the objective

[22] See EEA, Indicator Assessment, Greenhouse gas emissions from transport in Europe, https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-greenhouse-gases-7/assessment.

[23] The values shown include all domestic transport emissions as well as international aviation and international maritime transport. The 'with existing measures' scenario reflects existing policies and measures and the 'with additional measures' scenario also includes further planned policies and measures reported by Member States until March 2020.

[24] The EU Strategy for Sustainable and Smart Mobility (EUSSSM) was announced by the European Commission as part of its Communication on the European Green Deal. The EUSSSM aims to contribute to the achievement of the EU Green Deal target of reducing transport-related GHG emissions by 90% by 2050.

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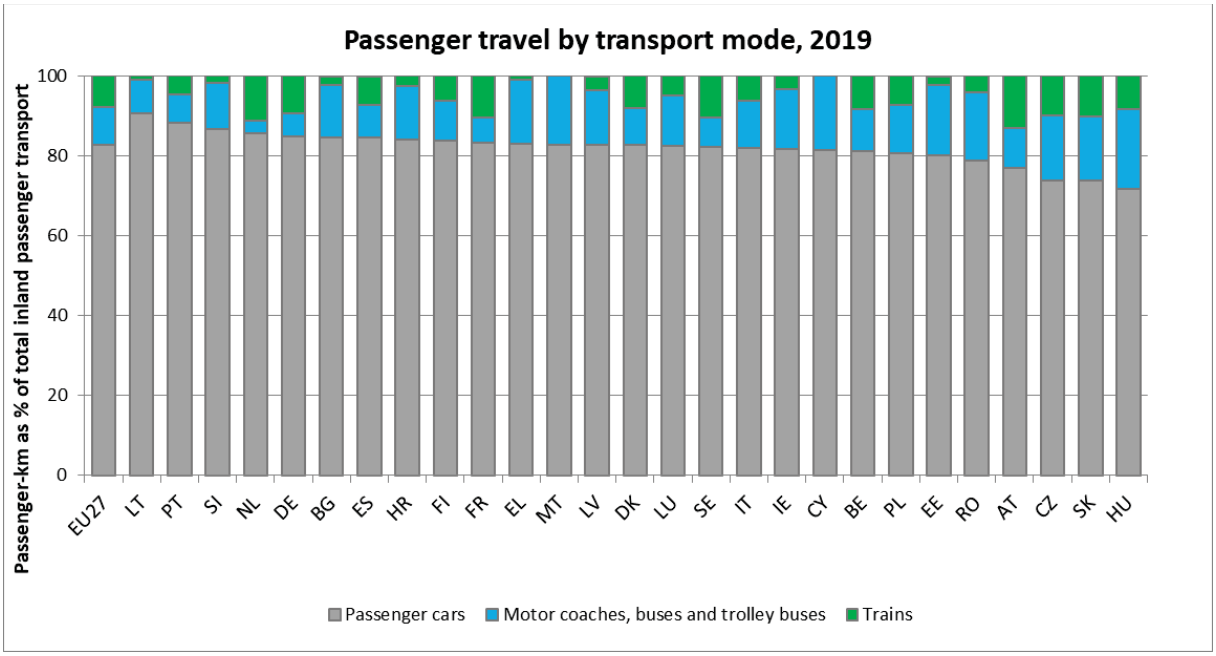
of reducing emissions by 90% by 2050. As part of the strategy, the Commission will foster the use of more sustainable transport modes such as rail and inland waterways.

The use of cars remains predominant for passenger travel and has even expanded slightly in recent years (Figure 3-5). In 2014, cars were used for 82.2% of inland travel and in 2019 for 82.8%. The share of passenger travel by train increased slightly from 7.7% to 8.0%, meaning that the share by buses, trams and trolleybuses fell from 10.1% to 9.2%. Cars account for less than 80% of passenger travel in only 5 Member States (Romania, Austria, Slovakia, Czechia and Hungary), while in Lithuania the share is over 90%.

Figure 3-5 Passenger travel by transport mode, 2019



Source: EUROSTAT

These trends are a matter of concern as transport is responsible for almost a quarter of EU GHG emissions and is the main cause of air pollution in cities. Roads are by far the biggest emitter accounting for over 70% of all GHG emissions from transport in 2019. Emissions from road transport, however, are expected to diminish as it decarbonises faster than other modes. The largest increases are expected in aviation and international maritime transport, which are likely to account for a bigger share of transport emissions in coming years.

As in the case of passenger travel, most goods in the EU are transported by road (Figure 3-6). In 2019, 76.6% of freight was carried by road, up from 73.9% in 2014. In 8 countries, the share is over 80%, peaking at 98 and 99 in Greece and Ireland, respectively (Malta and Cyprus have no inland waterways and railways transport, therefore the share freight carried by road is 100%). At the other end of the scale, over half of freight is transported by rail or inland waterways in Bulgaria, Romania, Latvia and Lithuania.

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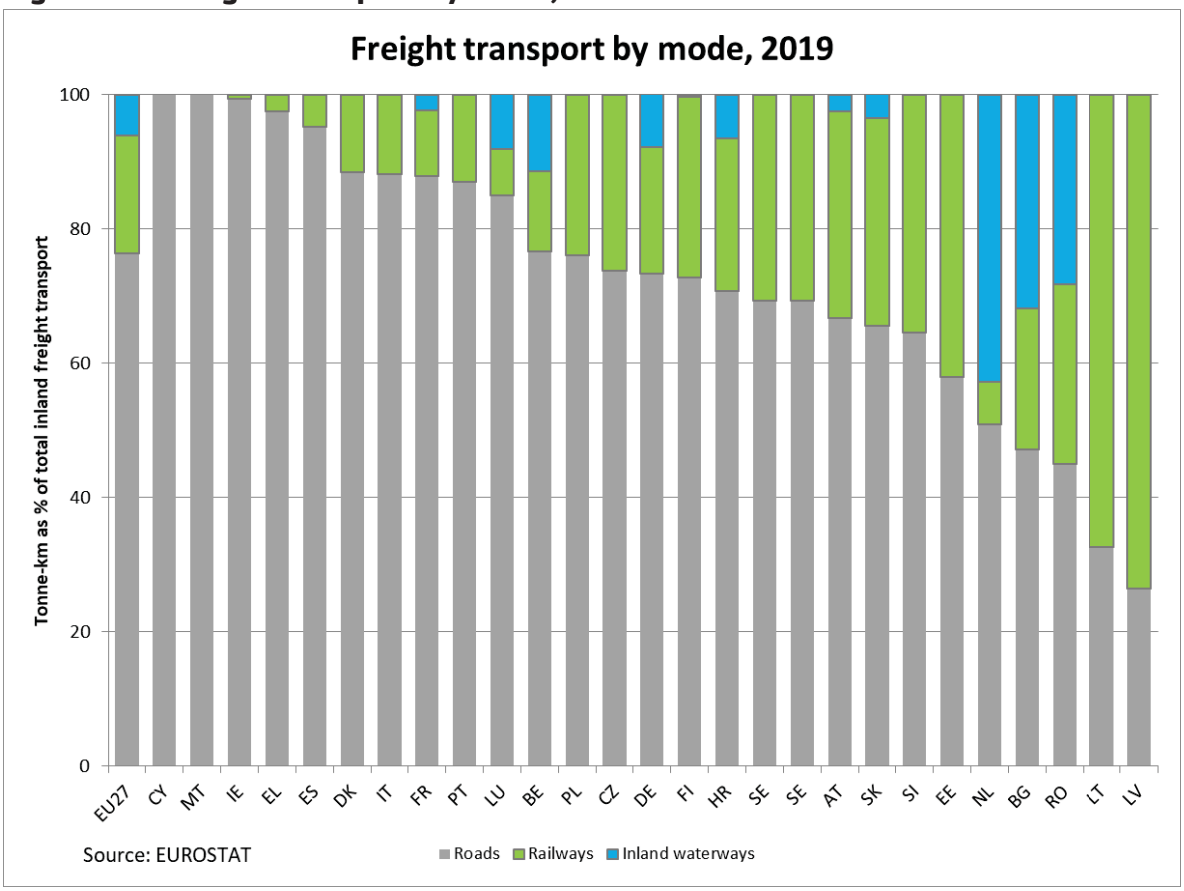
Figure 3-6 Freight transport by mode, 2019



Source: EUROSTAT.

3.3 Reducing the impact of climate change

Climate change is recognised as the most serious threat to human societies around the world. Scientists see an increase in global temperature of 2°C relative to pre-industrial times as the threshold beyond which there is a very real risk that dangerous and possibly catastrophic changes in the global environment will occur. The past three decades have been warmer than any previous decade since records began in 1850. All parts of the world are potentially affected by the consequences of a rapid rise in temperature and the various climatic changes that are associated with it. Southern and part of Eastern Europe will experience more frequent and severe heat waves, forest fires and droughts. Already Northern Europe is becoming much wetter, with increasing risk of floods and extreme weather events, while coastal areas face the devastating consequences of rising sea levels from the melting of polar ice sheets and glaciers. The marine environment is also heavily affected by climate change and these impacts are projected to increase dramatically with severe implications for marine currents, vulnerable ecosystems such as coral reefs, biological resources and food chains.

The effects of climate change pose a major challenge for a growing number of EU regions. Around 7% of EU population live in areas at high risk of floods and over 9% live in areas where there are already over 120 days a year without rain. The exposure of EU regions to the damaging effects of climate change, however, differ widely between them, depending on

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their location but also the structure of their economies, given that sectors such as tourism or agriculture are likely to be particularly affected.

3.3.1 The threat of floods from climate change

Flooding is a major cause of economic damage and loss of life in Europe and other parts of the world[25]. Despite considerable efforts to reduce the risk, the damage from floods appears to have increased over recent decades[26]. Ongoing climate change coupled with growing land take, especially in flood plains, is likely to further increase the social and economic damage in the EU.

The greater risk of floods for future societies makes it important to identify adaptation strategies that are effective and sustainable in economic, social and environmental terms. In particular, such strategies need to be assessed in terms not only of their effectiveness in reducing the potential damage, but also of the economic costs involved (e.g. for building and maintaining defences). According to recent estimates of the consequences of river flooding[27], if no mitigation and adaptation measures are taken and the global temperature rises by 3°C by the end of the century, economic losses from river flooding will grow to nearly €50 billion a year, or over 6 times more than at present, and nearly three times as many people would be exposed to flooding[28]. The damaging effects are projected to increase with higher temperatures and economic growth in almost all EU regions, although countries in Eastern Europe would suffer larger losses relative to their GDP (
Map 3-5). Limiting global warming to 1.5°C would halve economic losses and the population exposed to river flooding in the EU.

[25] See for instance Alfieri, L., Feyen, L., Dottori, F., Bianchi, A. (2015), "Ensemble flood risk assessment in Europe under high end climate scenarios", Global Environmental Change 35, 199–212, https://doi.org/10.1016/j.gloenvcha.2015.09.004.

[26] Paprotny, D., Sebastian, A., Morales-Napoles, O., Jonkman, S. (2018) Trends in flood losses in Europe over the past 150 years. Nature Communications 9(1), 1985, https://doi.org/10.1038/s41467-018-04253-1.

[27] Dottori F, Mentaschi L, Bianchi A, Alfieri L and Feyen L (2020), "Adapting to rising river flood risk in the EU under climate change", Publications Office of the European Union, Luxembourg, doi:10.2760/14505, JRC118425.

[28] Dottori F, Mentaschi L, Bianchi A, Alfieri L and Feyen L (2020), "Adapting to rising river flood risk in the EU under climate change", Publications Office of the European Union, Luxembourg, doi:10.2760/14505, JRC118425.

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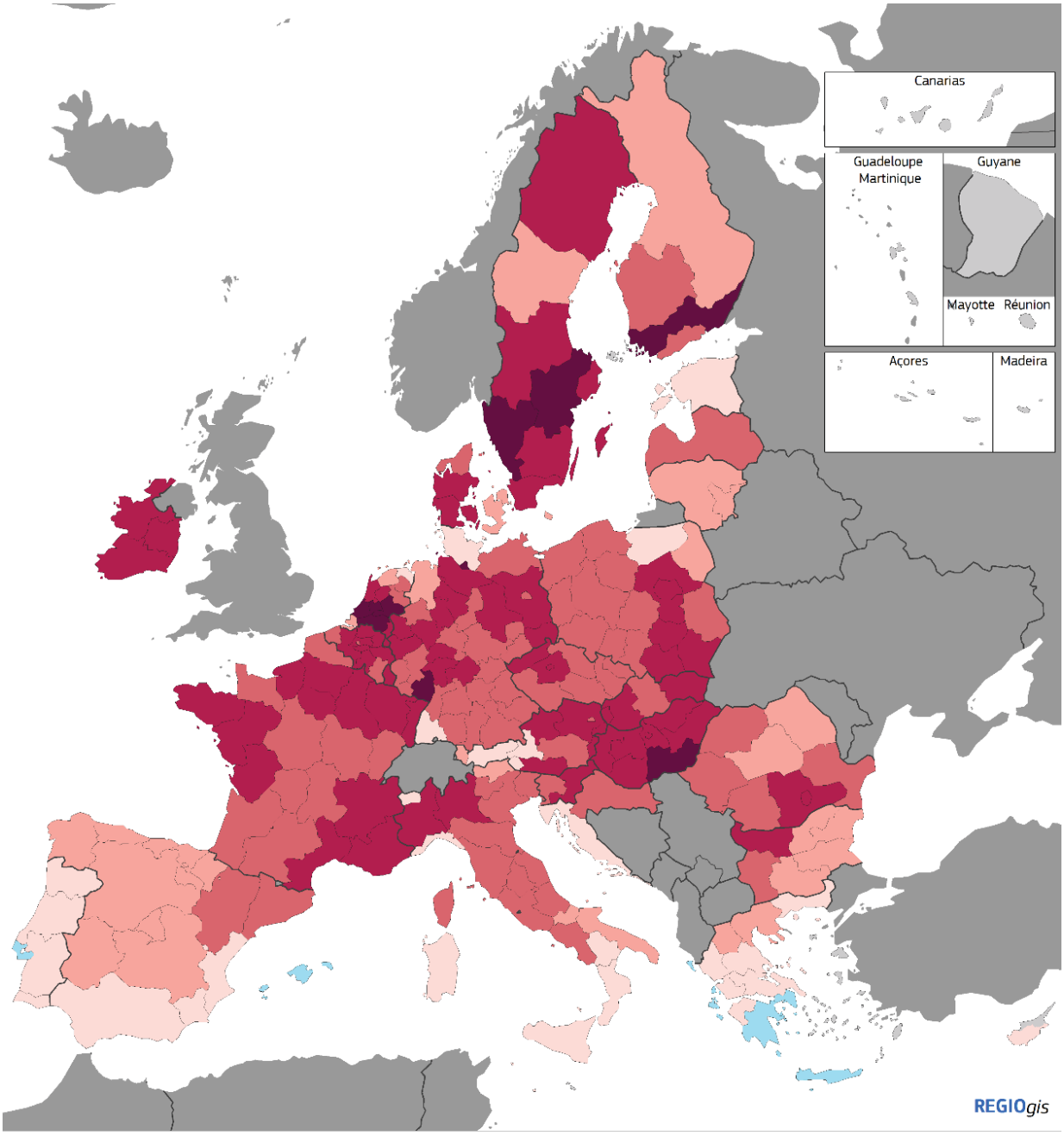
Map 3-5 Economic damage due to floods in 2100 under the 3°C warming scenario relative to the baseline



Economic damage due to flooding under the 3°C warming scenario, 2100

% change relative to baseline

- < 0
- 0 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- > 1000
- no data

EU-27 = 498
JRC

0 500 Km

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Flood risk reduction strategies can substantially reduce the projected losses due to climate change. However, these strategies have different costs as well as benefits, as illustrated by a recent study which assessed four different approaches to limit the damages from coastal flooding[29]:

- Strengthening existing dyke systems, which is likely to have larger benefits than costs but tend to transfer risks downstream by stimulating further the development of human settlements and activities in risk zones behind flood barriers, which can result in catastrophic effects in case of failure;
- Retention areas and dykes require large investment but can reduce the economic and human losses substantially;
- Flood proofing buildings can markedly reduce losses with limited investment, but they do not prevent floods from happening and so can only partly prevent flood damage.
- Relocation can produce the largest benefits but tends to be the least cost-effective, though the costs involved vary substantially; it also tends to have low social acceptance.

Results suggest that reducing flood peaks using retention areas has strong potential for lowering the effects in a cost-efficient way in most EU countries (see section 3.3.2). Implementing such a strategy at EU level could reduce the economic damage and population exposed to flooding by over 70% by 2100. Moreover, retention areas have many additional benefits, such as restoring the natural functioning of flood plains and improving the ecosystem by improving nutrient removal, water filtration and the replenishment of groundwater reservoirs, providing fish-spawning habitat as well as opportunities for recreation and nature-based activities. Depending on local circumstances, other strategies than creating retention areas may be more suitable.

3.3.2 Protecting Europe's coasts against rising seas

Coastal zones are areas of high interest. Over 200 million people in the EU live within 50 km of the coast, stretching from the north-east Atlantic and the Baltic to the Mediterranean and Black Sea and in the EU outermost regions, and the evidence is that migration to coastal zones is continuing. Such areas in many cases are locations for major commercial activities and support diverse ecosystems with important habitats and sources of food.

Coastal zones are particularly vulnerable to climate change due to the combined effects of rising sea levels and the increasing frequency and intensity of storms, adding to already significant pressures from human activities. The mean global sea level has increased by 13-20 cm since pre-industrial times[30] and at an accelerating rate since the 1990s, the rise since

[29] Vousdoukas, M. I. et al (2020), « Economic motivation for raising coastal flood defences in Europe", Nature Communications 11, 2119, doi:10.1038/s41467-020-15665-3.

[30] See for instance Dangendorf, S. et al (2019),, "Persistent acceleration in global sea-level rise since the 1960s", Nature Climate Change 9, 705-710, doi:10.1038/s41558-019-0531-8.

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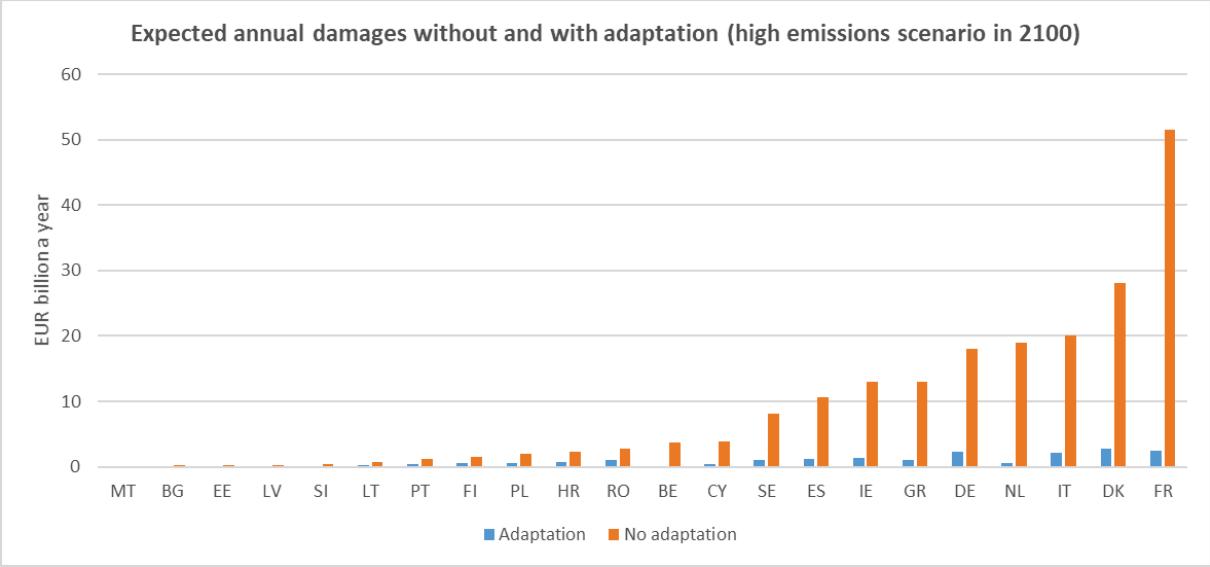
1950 being explicable by global warming[31]. This has already contributed to coastal erosion and made Europe's coasts more susceptible to hazards. The continued rise in sea levels from global warming could result in unprecedented coastal flood losses in the EU unless additional coastal protection and measures to reduce risks are implemented.

This is affirmed by a recent study[32], which assesses the costs and benefits of applying additional protection through dyke improvements. The largest amounts of damage are projected for France, Denmark, Italy, the Netherlands and Germany (Figure 3-7), though for some countries the potential damage is larger in relation to GDP, such as for Cyprus (5%), Greece (3%) and Denmark (2%). Appropriate adaptation measures are therefore needed to lessen these damaging effects.

Figure 3-7 Estimated damage to coastlines in 2100 without and with adaptation measures (high emissions scenario) [33]



Source: Vousdoukas et al. (2020).

As argued by the authors, raising dyke levels along the EU coast could significantly reduce damages from flooding. The costs and benefits involved, however, vary markedly along coastal sections. The presence of human settlements makes investing in dykes economically beneficial, typically when population density exceeds 500 people per square km. In urbanised and major economic areas, the benefits of raising dykes tend to be several times the costs.

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31 Fasullo, J. T. and Nerem, R. S. (2018), "Altimeter-era emergence of the patterns of forced sea-level rise in climate models and implications for the future", Proceedings of the National Academy of Sciences 115, 12944-12949, doi:10.1073/pnas.1813233115

32 Vousdoukas, M., Mentaschi, L., Hinkel, J., Ward, Ph., Mongelli, I., Ciscar,J-C, and L. Feyen (2020), "Economic motivation for raising coastal flood defenses in Europe", Nature Communications 11, 2119, doi:10.1038/s41467-020-15665-3.

33 Projections to 2100 under a high emissions scenario corresponding to a global warming scenario called "RCP8.5" frequently referred to as "business as usual", suggesting it is a likely outcome if concerted efforts are not made to cut GHG emissions.

Under a high emissions scenario, this would be the case for around 23% of the EU coastline. For the remainder, additional protection against coastal flooding is not needed or is not economically beneficial. This is either because natural barriers will provide sufficient protection against the rise in sea levels or because the costs of increasing dyke levels outweigh the benefits, such as in almost inhabited areas or along winding coastlines.

The analysis suggests that the average increase in the height of coastal defences needed where further protection is required is one meter under a high emissions scenario. In Slovenia, Latvia, Poland, Germany and the Netherlands it is well above this, and in Belgium it is over 2 meters. This implies that along many such areas, the shoreline might well become disconnected from hinterland areas.

When benefits and costs are aggregated across coastal sections of NUTS2 regions, the benefits to cost ratio (BCR) is highest in urban centres (Map 3-6). Adaptation brings large net economic benefits in the Ionian Islands (a BCR of 30 under a high emissions scenario), País Vasco (27), Aquitaine (16), Calabria (11.3), Basse-Normandie (14), Pays de la Loire (13), Puglia (11) and Alentejo (11).

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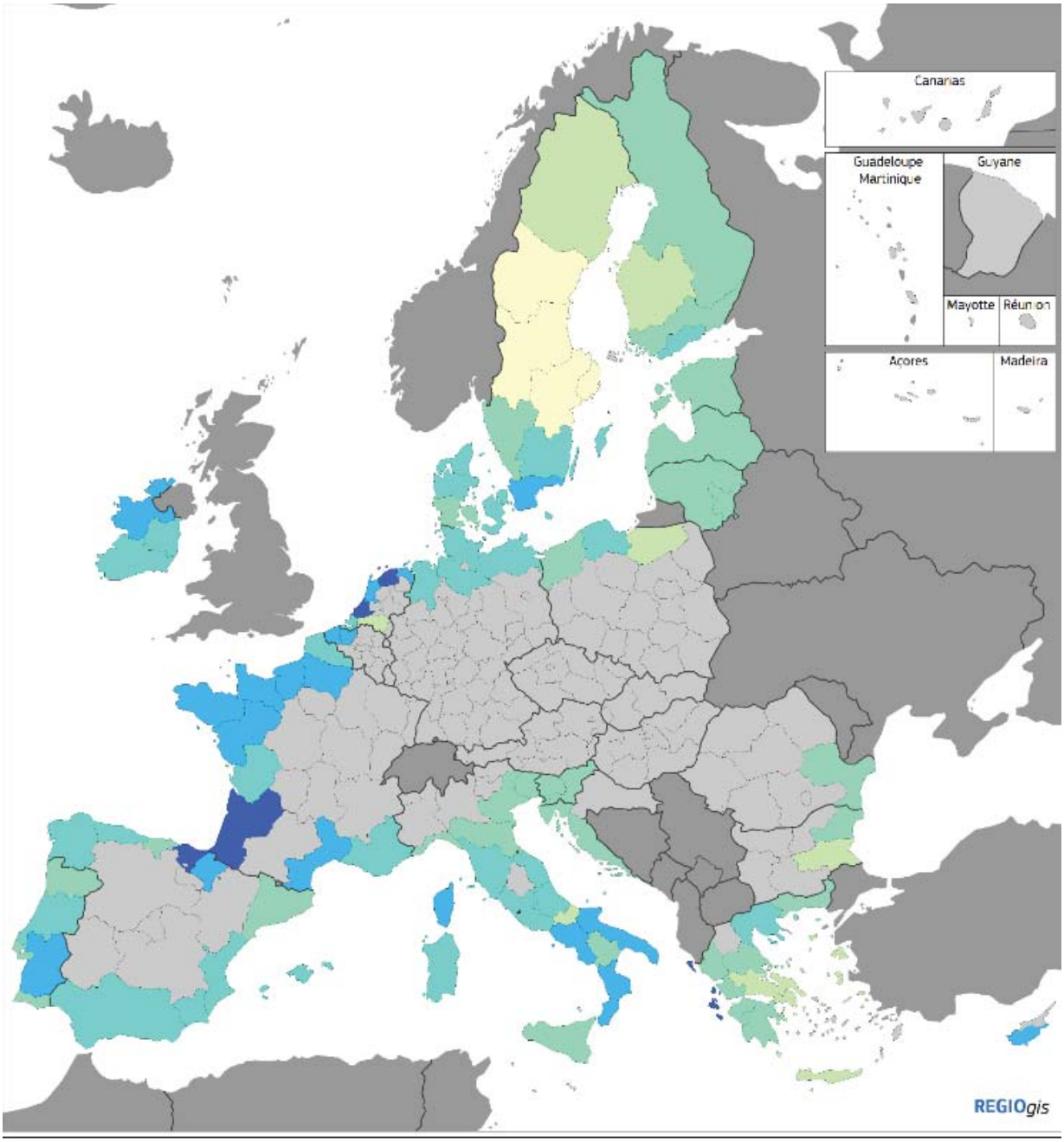
Map 3-6 Benefit to cost ratios of elevating dykes in NUTS2 regions under a moderate mitigation and high emissions scenario



Benefit to cost ratio of elevating dykes, high emissions scenario

Benefit to cost ratio

0	8 - 16
<= 2	> 16
2 - 4	no data
4 - 8	

Source: JRC, PESETA

0 500 Km

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Aggregating the results for coastal sections to the country level shows the Netherlands to have the highest BCR under a high emissions scenario (18), followed by Greece (12), France and Belgium (11 for each). By contrast, the BCR is low – though still over 1 – in Bulgaria, Finland, Romania, Croatia and Malta (3 or less in each case).

Investments in green infrastructure can also provide an efficient mean to enhance EU coastal defences against sea level rise. In particular, protecting and restoring costal ecosystems such as seagrass meadows and coral reefs can buffer the impacts of storms and help to reduce coastal erosion while bringing simultaneous benefits for biodiversity and natural resources.

3.3.3 Infrastructure is also at risk

The EU has an extensive transport network, with around 5 million km of paved roads, 0.5 million km of railways, over 2 400 airports, and almost 2 000 seaports, with a combined estimated value of around EUR 9 trillion. This is particularly susceptible to climate hazards and so is generally built to withstand the variations in temperature as indicated by historical observations, or according to regional standards of construction. However, rises in average temperatures or greater frequency of extreme weather events as a result of increased GHG emissions are likely to lead to increased economic losses.

A recent study[34] estimates the direct effects of flooding and heatwaves (two of the most damaging climate-related hazards according to a 20 year review by the UN Office for Disaster Risk Reduction[35]) on the transport network in the EU, covering the modes of roads, railways, airports, and seaports. For each hazard, the effect is estimated as the change in expected annual damage for global warming levels of 1.5, 2, and 3°C relative to 1981–2010.

As would be expected, flood risk is concentrated in areas prone to flooding with high-value infrastructure, such as motorways and electrified railways. Some 95% of potential flood damage comes from roads and railways, with airports and seaports accounting for only 4%. The estimated cost of potential damage to railways is particularly high, at almost twice that of roads, reflecting the much higher costs of reconstruction and their location in lower lying terrain.

Nearly all regions in the EU are expected to experience increasing flood damage to their infrastructure as a results of climate change, particularly those prone to flooding in north-western and Eastern Europe, where the damage could in some case be over 6 times the present damage with global warming of 3°C. For most southern regions, damage to transport infrastructure from floods is projected to increase less dramatically, but could still be over twice as high as today (Map 3-7).

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[34] Feyen, L., Mulholland E., Dottori, F., Alfieri, L., Mentaschi, L., Ciscar, J-C, (2020), "Climate change impacts and adaptation in Europe" - PESETA IV. JRC.

[35] Pascaline, W. and H. Rowena (2018), "Economic Losses, Poverty & Disasters: 1998-2017". United Nations Office for Disaster Risk Reduction.

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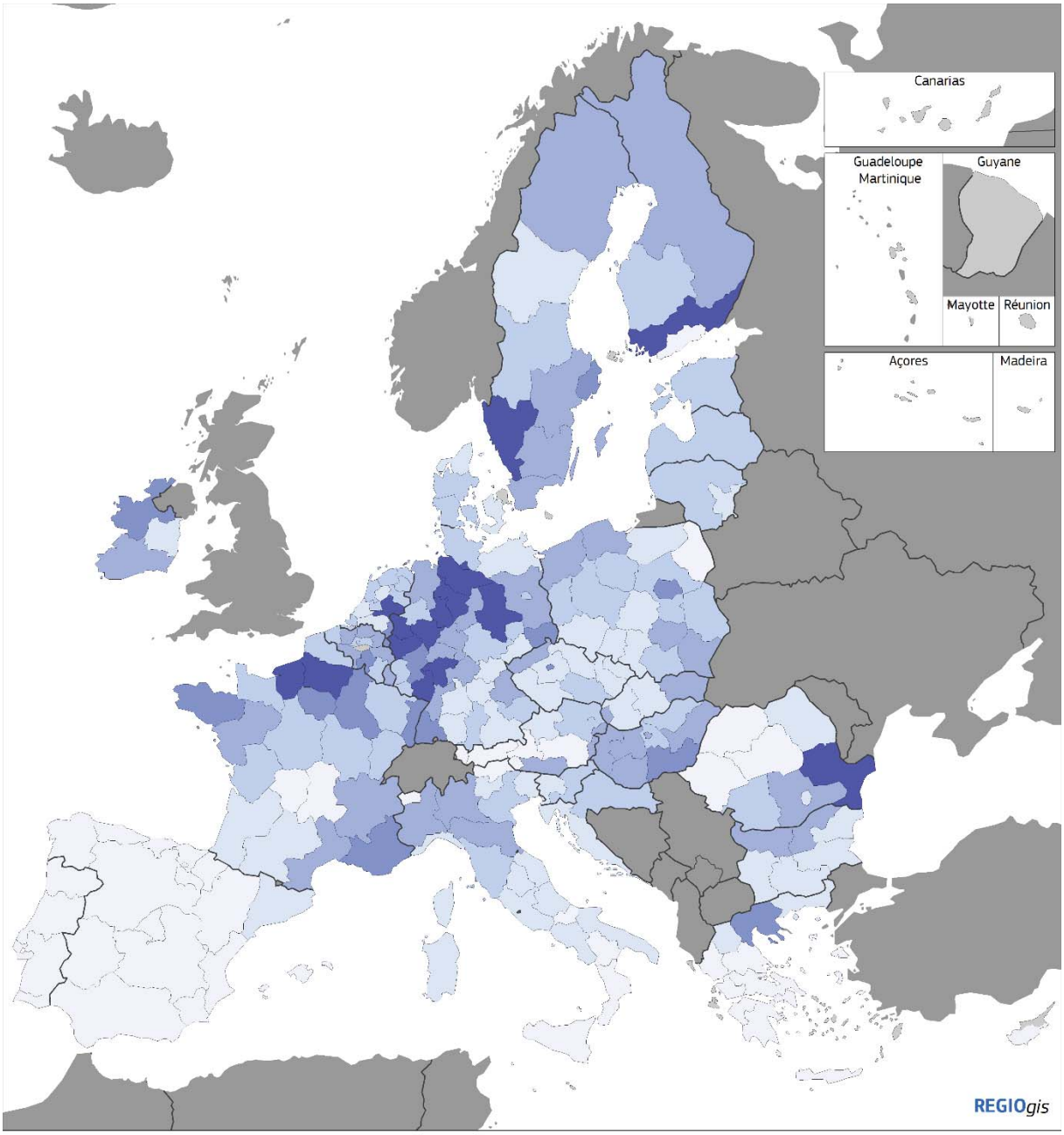
Map 3-7 Expected annual damage to infrastructure due to inland flooding under a global warming scenario of 3°C



Expected annual damage to infrastructure due to inland flooding under a global warming scenario of 3°C

% change over baseline

- <100
- 101-200
- 201-300
- 301-400
- 401-500
- >500
- no data

Source: JRC

0 500 Km

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Road maintenance costs are also projected to rise in all EU regions as a result of more frequent spells of extreme heat. The most significantly affected countries in terms of additional cost to maintenance are Bulgaria, Poland, Greece, Ireland and Romania. Future risk can be alleviated by upgrading roads or doing more frequent maintenance.

Most of the increased maintenance costs are on tertiary and rural roads, which are generally managed by local authorities. Since their road maintenance budgets already tend to be constrained, damages from climate change could be particularly problematic for them.

The buckling of railway lines is also likely to occur more frequently with global warming so increasing maintenance costs. The biggest increases (of up to 10% with global warming by 3°C) are projected for regions in Germany and southern Spain, because of stress-free temperatures[36] being likely to be exceeded most often. Significant increases are also likely in regions in Belgium, France, Sweden, Finland, Poland and Czechia.

3.3.4 Unevenly distributed impact of extreme temperature events

Extreme heat events are projected to happen more frequently and become more intense with climate change. The number of people exposed to heatwaves in the EU is projected to grow from 10 million/year (average 1981-2010) to nearly 300 million/year in a scenario with 3°C global average warming by the end of this century[37]. As a result, the number of fatalities from extreme heat could increase up to nearly 100,000 per year if no mitigation measures are taken, which is significantly higher than the current 2,750 annual deaths.

The exposure of the population to the risk of extreme temperature considerably varies across EU Member States and regions. Risks of being exposed to extreme heat should increase in southern Europe while milder winters could reduce significantly exposure to extreme cold, nearly 10-fold with 3°C global average warming by the end of this century (Map 3-8). Heatwaves, human exposure and fatalities are projected to increase everywhere in Europe but Cyprus, Greece, Malta and Spain could see a 40-fold increase in mortality from heatwaves if no adaptation and mitigation actions are taken.

[36] Stress-free (or neutral) temperature is the point at which the rail is not in tension or compression. The stress-free temperature is usually set at 5° or so above the mid-point between the lowest and highest temperature the rail is likely to reach. Railway companies need to monitor the stress-free temperature of the rail to identify risks, plan effective maintenance and maintain safety and operating performance.

[37] The PESETA IV task on human impacts of heat and cold extremes provides a quantitative assessment of human exposure to and mortality from these extremes in Europe. The methodology integrates empirical data on human losses from disasters, past climate information, EUROSTAT demographic data and high resolution climate and socio-economic projections.

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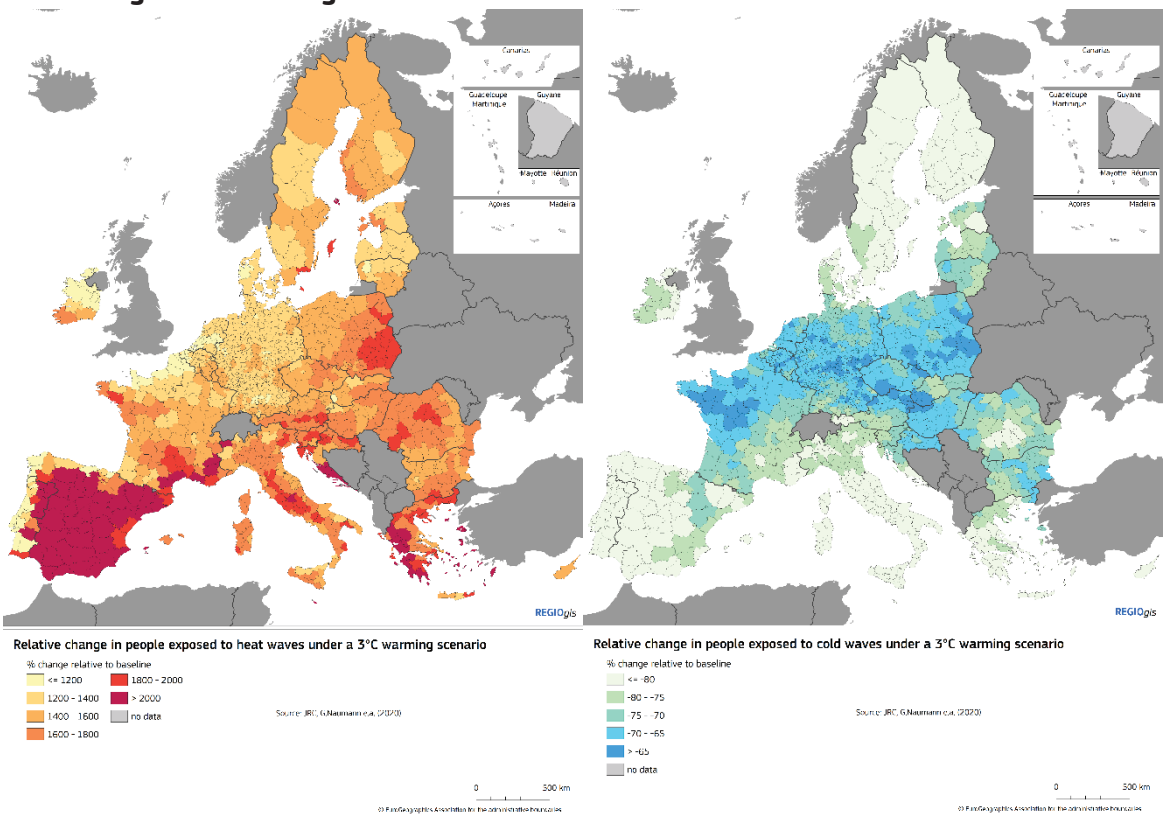
Map 3-8 Projected changes in human exposure to heat and cold waves events for a 3.0°C levels of global warming



In order to limit exposure and the increase of fatalities linked to extreme heat, a wide range of measures can be taken, including improved design and insulation of houses, schools and hospitals, education or early warning systems. This risk also needs to be taken into consideration in urban planning in order to minimise the urban heat island effect[38]. In that perspective, urban green infrastructure can play an important role, notably by increasing tree and vegetative cover, installing green or reflecting roofs, or using cool pavements (see section 3.5).

3.4 Improving our environment

The EU faces unprecedented challenges of environmental sustainability, notably from accelerating biodiversity loss, degradation of ecosystem services, depletion of scarce resources and various forms of pollution, with the associated risk to human health and well-being.

38 Urban heat islands are urbanised areas that experience higher temperatures than outlying areas. This is often due to the fact that structures such as buildings, roads, and other infrastructure absorb and re-emit the sun's heat more than natural landscapes such as forests and water bodies.

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As pointed by a series of recent scientific reports from the EEA, IPCC, IPBES, IRP and UN Environment[39], current trends in production and consumption are fundamentally unsustainable.

The EU has launched many policy initiatives to address these challenges, putting in place a broad range of legislation to reduce air, water and soil pollution. These have produced substantial benefits over recent decades. EU citizens enjoy some of the best water quality in the world and over 18% of the EU land area has been designated as protected for nature. As part of the European Green Deal, the European Commission adopted the EU Biodiversity Strategy 2030, which acknowledges nature restoration as a key contribution to both climate change mitigation and adaptation, the Farm to Fork Strategy[40], the Zero pollution action plan[41], the EU forest strategy[42] and the EU Soil Strategy[43]. The 8th Environmental Action Plan is designed to support the objectives of the European Green Deal and the transition towards a climate-neutral, resource-efficient and regenerative economy while improving the status of ecosystems.

These EU initiatives have set targets to tackle environmental challenges via concerted action and systemic solutions. Their delivery will greatly depend on support from EU and national policy and funding instruments.

3.4.1 More investment needed to improve water quality

Essential for human health and well-being, water is also a key resource for agriculture, certain industries, energy production and transport. Water and wetland areas are also

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39 Intergovernmental Panel on Climate Change (IPCC) reports on 1.5 °C Global Warming and Climate Change and Land; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment Report on Biodiversity and Ecosystem Services; International Resource Panel (IRP) Global Resources Outlook report; UN Environment Global Environment Outlook 6.

40 The farm to fork strategy sets ambitious targets by 2030 on reducing the use and risk of chemical pesticides and the use of more hazardous pesticides by 50%, reducing nutrient losses by at least 50%, reducing the use of fertilisers by at least 20%, reducing the sales of antimicrobials for farmed animals and in aquaculture by 50% and reaching 25% of agricultural land under organic farming. The reform of the Common Agricultural Policy and the national CAP Strategic Plans to be in place as of 2023 will contribute to achieving those targets.

41 The zero pollution action plan for 2050 aims at reducing air, water and soil pollution to levels no longer considered harmful to health and natural ecosystems. It includes key 2030 targets: improving air quality to reduce the number of premature deaths caused by air pollution by 55%; improving water quality by reducing waste, plastic litter at sea (by 50%) and microplastics released into the environment (by 30%); improving soil quality by reducing nutrient losses and chemical pesticides' use by 50%; reducing the EU ecosystems where air pollution threatens biodiversity by 25%; reducing the share of people chronically disturbed by transport noise by 30%, and significantly reducing waste generation and residual municipal waste by 50%.

42 The new EU forest strategy for 2030 supports the EU's biodiversity objectives as well as the GHG reduction target of at least 55% by 2030 and climate neutrality by 2050.

43 EU Soil Strategy for 2030: reaping the benefits of healthy soils for people, food, nature and climate (COM(2021) 699 final). The aim of the EU Soil Strategy is to help achieve land degradation neutrality by 2030. The strategy will consider challenges such as identifying contaminated sites, restoring degraded soils, defining the conditions for their good ecological status and improving the monitoring of soil quality.

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necessary for the provision of a number of ecosystem services (e.g. floodplains) and indispensable for preserving biodiversity as habitats for many species.

The condition of water bodies in the EU is a concern. Only 40 % of these are in good ecological state and many wetlands are in a poor condition[44]. Even though various sources of pollution have been reduced over the past decade, the pressure from nutrients[45], hazardous substances and over-abstraction of water remains high. This implies that the objective set in the Water Framework Directive (2000/60/EC) of achieving good qualitative and quantitative status of all water bodies by 2015 is still not reached.

Most EU citizens benefit from good water services (such as drinking water supply, and waste water collection and treatment) but access to those services is still lacking in a number regions, notably rural areas and less developed regions.

The Urban Waste Water Treatment Directive[46] (UWWTD) has a key role in reducing water pollution in the EU by requiring Member States to collect and treat urban wastewater. Its objective is for all wastewater to be collected and suitably treated. Implementing the Directive requires significant investment in new infrastructure but also in the maintenance and extension of existing facilities.

The considerable investment made in improving urban wastewater treatment has helped to reduce concentrations of organic matter and nutrients in surface waters. In 2018, more than 98% of urban wastewater was collected[47], though there are still a number of agglomerations where infrastructure needs to be built or improved. Only around 89% of wastewater was collected in Croatia and 85% in Cyprus, while in Romania, the figure was less than 80%, with just 57% being collected in Sud-Muntenia.

Significant effort is still required regarding treatment[48]. In the EU, around 7% of urban waste water failed to meet secondary treatment (biological) standards in 2018, while over 16% did not meet more stringent standards (removal of phosphorus and nitrogen). Almost 79% of regions in EU provide at least secondary treatment to 90% of their urban wastewater, but this share falls to 57% for more stringent treatment. Less than 30% of urban wastewater

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44 European Environment Agency (2019), The European environment — state and outlook 2020, Knowledge for transition to a sustainable Europe, Luxembourg, Publications Office of the European Union. doi: 10.2800/96749.

45 Nutrient pollution is caused by excess nitrogen and phosphorus in the air and water. Nitrogen and phosphorus are nutrients that are natural parts of aquatic ecosystems.

46 Council Directive 91/271/EEC.

47 These figures do not systematically correspond to the targets set in the UWWTD as in some Member States not all agglomerations are required to comply with the provisions of the Directive because of transitional periods.

48 The level of treatment partly determines the effect of wastewater on aquatic ecosystems. Primary (mechanical) treatment removes part of the suspended solids, while secondary (biological) treatment uses aerobic or anaerobic micro-organisms to decompose most of the organic matter and retain some of the nutrients. Tertiary (advanced) treatment removes the organic matter even more completely.

receives tertiary treatment in Croatian regions, some regions in Italy, Romania and Spain and in a number of French and Portuguese outermost regions (Map 3-9).

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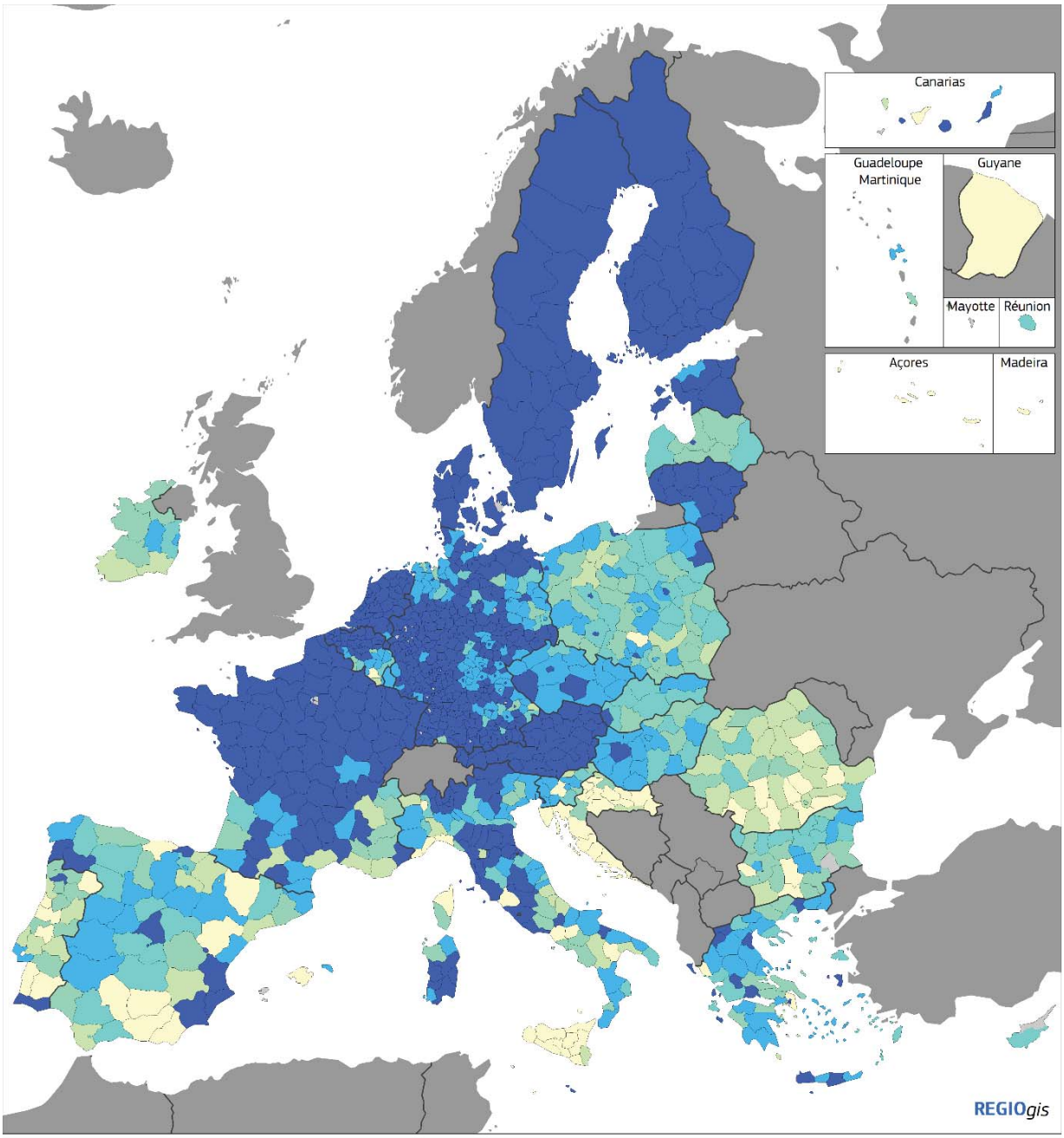
Map 3-9 Urban wastewater receiving more stringent treatment



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COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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CHAPTER 3 A Greener, low-carbon Europe – PART 2

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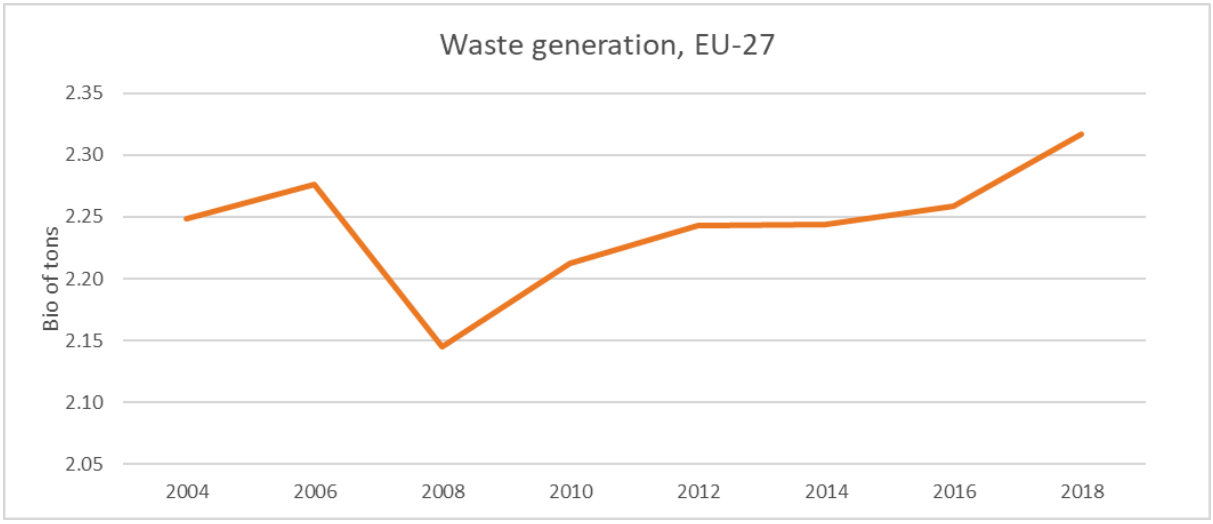
3.4.2.Waste production remains high, but more is recovered

The Waste Framework Directive is the EU's legal framework for treating and managing waste in the EU. It aims at protecting the environment and contributing to the EU's transition to a circular economy. It sets objectives and targets to improve waste management, stimulate innovation in recycling and limit landfilling. In 2020, the European Commission also adopted the new circular economy action plan (CEAP) as one of the main building blocks of the European Green Deal with the objective to reduce pressure on natural resources and create sustainable growth and jobs.

In 2018, more than 2.3 billion tons of waste were produced in the EU, i.e. around 5.2 tons per person. Waste generation follows the business cycle closely (Figure 3-8). It fell in 2008 when the financial and economic crisis struck, but increased with the recovery to levels higher than before. Behaviour as regards the generation of waste, therefore, does not seem to change much over time.

Figure 3-8 Waste generation, EU-27, 2004-2018



Source: EUROSTAT.

Construction is the main source of waste generation in the EU (being responsible for 36% of the total in 2018), followed by mining and quarrying (26%), manufacturing (11%), waste and water services (10%), households (8%), other services and energy (4% each). Most waste generated by construction and mining and quarrying is classified as major mineral waste, which represented around 65% of the total waste generated in the EU in 2018.

Waste generation per head is much higher in some Member States than others (Figure 3-9). In Finland, the figure was around 23 tons in 2018 as against only one ton in Latvia. In general, Member States with high levels of waste per inhabitant also have large shares from mining and quarrying, such as Romania, Finland, Sweden and Bulgaria, and/or construction and demolition activities, such as Luxembourg. For instance, around 30% of waste generated

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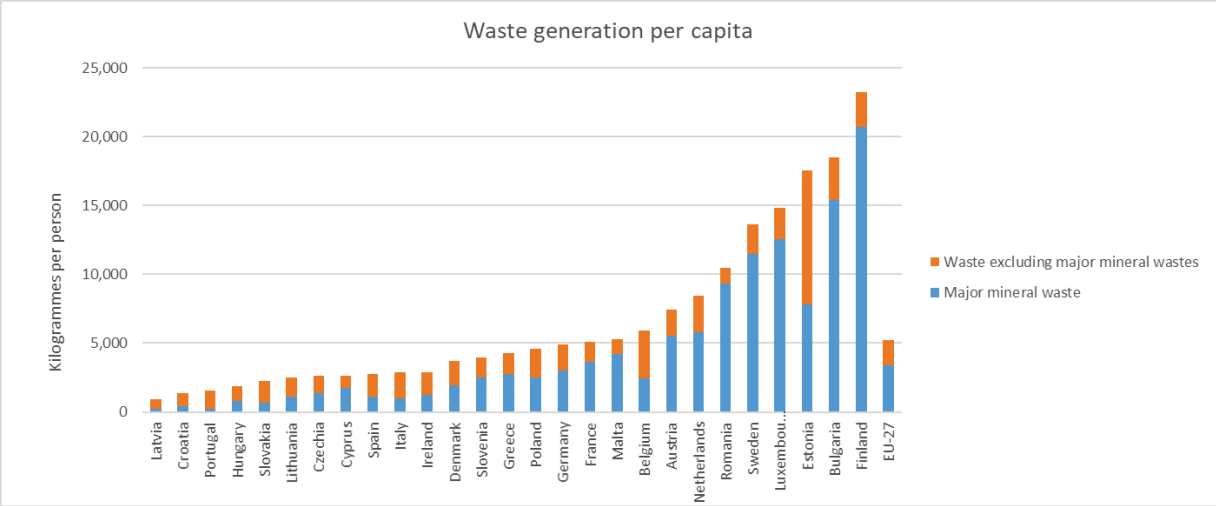
comes from mining and quarrying in Estonia[1] while this sector accounts for only 0.1% of waste generated in Latvia.

Figure 3-9 Waste generation per head, 2018



Source: EUROSTAT.

Waste management has been slowly improving in the EU. The share of waste recovered (i.e. recycled or incinerated with energy recovery) increased from 46% in 2004 to 54% in 2018. The quantity of waste subject to disposal (mainly going to landfill – 39% of the total in 2018) fell from 1 027 million tons in 2004 to 984 million tons in 2018, a reduction of 4%.

However, some Member States still lose a significant amount of 'secondary raw materials', such as energy, metals, wood, glass, paper and plastics, which they could potentially obtain from waste recovery. Although the share of recovered waste increased in most countries between 2010 and 2018, it fell in Cyprus, Finland, Greece, The Netherlands, Romania and Spain. In 2018, the share was smaller than 25% in Sweden, Finland, Greece, Romania and Bulgaria (where it was only 3%), while it was over 90% in Denmark and Slovenia (Figure 3-10).

The share of waste recycled has slightly increased in the EU-27, from 37% of total waste treated in 2010 to 38% in 2018. Recycling is by far the most important treatment mode in Italy and Belgium, where it reaches respectively 79% and 77% of waste treated. It is above 50% in only 8 Member States and is much lower in other countries, like for example in Bulgaria and Romania where only 3% of waste is treated by recycling (Figure 3-10).

[1] The large quantity of waste excluding major mineral waste generated in Estonia is from energy production based on oil shale.

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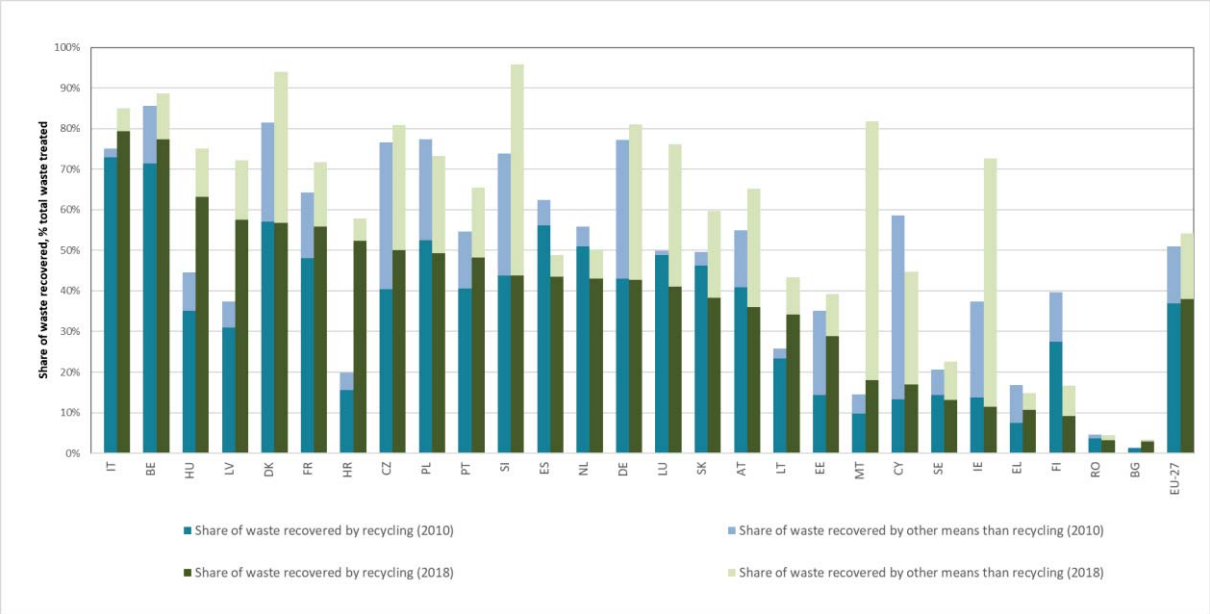
Figure 3-10 Share of waste recovered and recycled, 2010 and 2018



Source: EUROSTAT, env_wastrt.

Reuse, prevention and recycling are key to developing a circular economy. It is also essential for reducing sanitary risks and improving the quality of the environment. It helps to reduce GHG emissions (directly by cutting emissions from landfills and indirectly by recycling materials which would otherwise need to be extracted and processed). In countries where the share of recovered waste is small, there is a particular need to improve waste management, stimulate innovation in recycling, limit the use of landfill, and introduce incentives to change consumer behaviour.

3.4.3.Air quality has improved, but more needs to be done

Clean air is a critical natural resource for humans, plants and animals. Most pollutants are emitted by a wide range of human activities, in addition to some natural sources such as volcanic eruptions or dust from wind erosion. The EU has implemented a number of policies and pieces of legislation, such as the Air Quality Directive[2] and the National Emission reduction Commitments (NEC) Directive[3], which are helping to steadily improve air quality. However, hot-spots of pollution remain, which require efforts at EU, national and local level.

The emissions of most main air pollutants diminished in the EU between 2000 and 2017, while GDP increased (Figure 3-11). Air pollution seems now to be decoupled from economic

[2] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. It establishes standards for a range of pollutants including ozone (03), particulate matter (PM2.5 and PM10) and nitrogen dioxide (NO2).

[3] Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants. The Directive sets national emission reduction commitments for the years 2020-2029 and from 2030 onwards.

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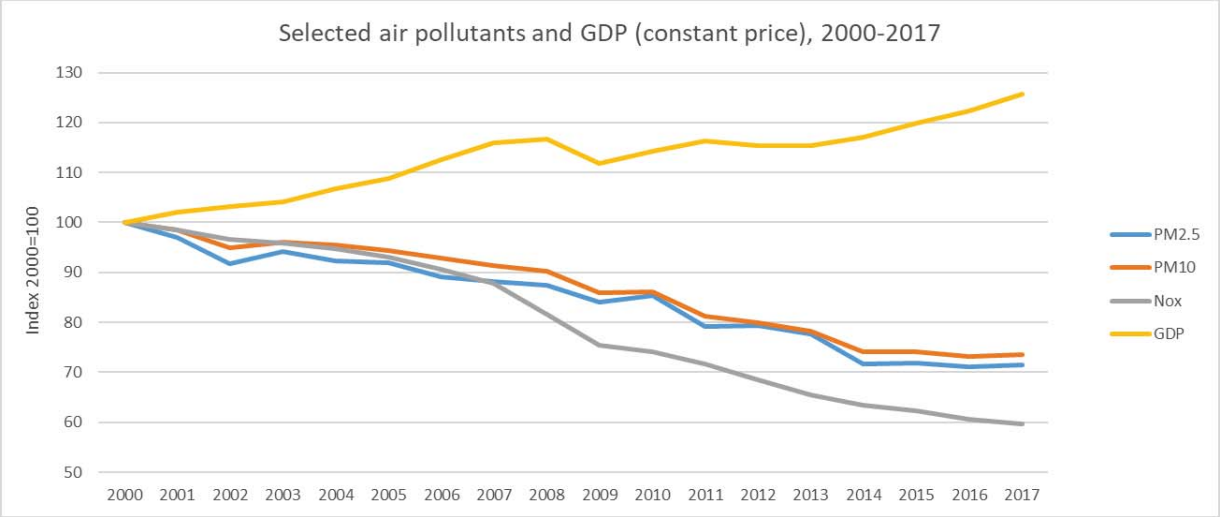
activity, reflecting changes in both technology (e.g. cleaner transport) and behaviour (e.g. increased use of renewable energy).

Figure 3-11 Emission of selected air pollutants and GDP, EU-27, 2000 and 2017



Source: EUROSTAT.

The reduction in emissions has led to a general improvement in air quality. In 2019, the EU complied with the 2010 ceilings[4] set under the 2001 NEC for total emissions of four main air pollutants: nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO_2) and ammonia (NH3). Only 4 Member States exceeded their national emission ceilings for NH3 (Croatia, Czechia, Ireland and Spain)[5].

However, substantial efforts are needed to reduce emission levels to meet the 2030 reduction commitments, with 11 Member States 30% above their NOx target and 10 with PM2.5 emissions needing be halved (Table 3-2).

Table 3-2 Distance to 2030 targets, (% of 2019 levels)

	NH3	NMVOC	NOx	PM2.5	SO2
Hungary	31	32	40	53	33
Romania	10	21	35	55	27
Czechia	9	36	36	51	11
Cyprus	-15	7	27	38	83
Slovenia	4	21	32	38	25
Germany	27	-4	48	15	24
Poland	11	9	18	47	20
Portugal	6	23	28	37	8
Spain	14	14	15	45	3

[4] According to the provisions of the NEC Directive, the emission ceilings for 2010 (established under the 2001 NEC Directive) remain applicable until the end of 2019.

[5] EEA (2021), 'National Emission reduction Commitments Directive reporting status 2021', Briefing no. 06/2021.

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Lithuania	3	33	37	-2	6
Ireland	9	23	30	3	0
Croatia	5	18	26	31	-22
Italy	1	15	26	25	-14
France	9	0	37	12	-7
Bulgaria	-1	27	9	40	-26
Denmark	10	-21	25	25	-3
Greece	-5	7	10	7	14
Slovakia	28	-3	8	-3	1
Austria	17	-5	45	13	-40
Latvia	19	12	5	19	-28
Luxembourg	22	11	48	-28	-30
Netherlands	2	-13	25	-3	-38
Finland	4	2	5	-3	-59
Sweden	10	-5	47	-43	-73
Estonia	6	-10	-25	-30	-29
Belgium	-2	-22	11	-15	-65
Malta	-6	26	62	6	-274
EU-27	12	15	36	28	12
Number of MS					
Below target	5	8	1	8	14
More than 30% above target	1	3	11	10	2

	NH3	NMVOC	NOx	PM2.5	SO2
Hungary	31	32	40	53	33
Romania	10	21	35	55	27
Czechia	9	36	36	51	11
Cyprus	-15	7	27	38	83
Slovenia	4	21	32	38	25
Germany	27	-4	48	15	24
Poland	11	9	18	47	20
Portugal	6	23	28	37	8
Spain	14	14	15	45	3
Lithuania	3	33	37	-2	6
Ireland	9	23	30	3	0
Croatia	5	18	26	31	-22
Italy	1	15	26	25	-14
France	9	0	37	12	-7
Bulgaria	-1	27	9	40	-26
Denmark	10	-21	25	25	-3
Greece	-5	7	10	7	14
Slovakia	28	-3	8	-3	1
Austria	17	-5	45	13	-40
Latvia	19	12	5	19	-28
Luxembourg	22	11	48	-28	-30

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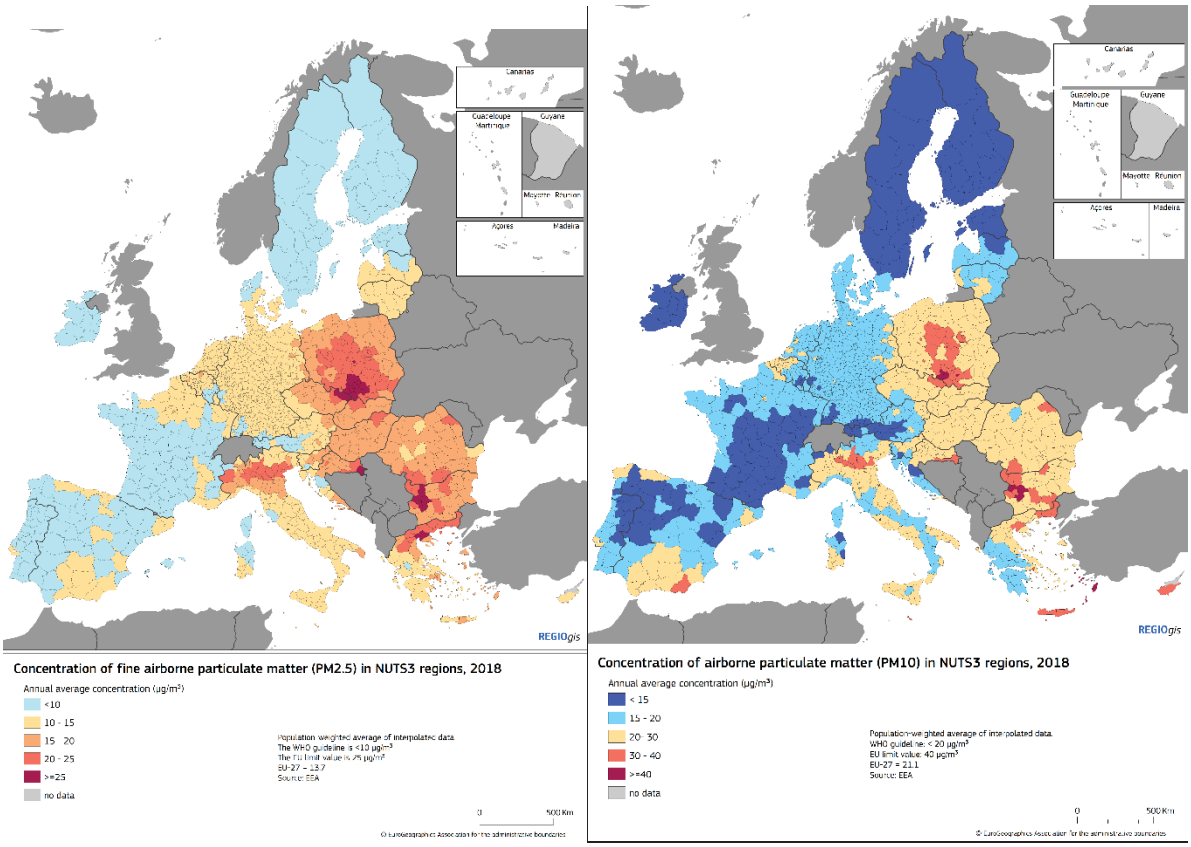
Netherlands	2	-13	25	-3	-38
Finland	4	2	5	-3	-59
Sweden	10	-5	47	-43	-73
Estonia	6	-10	-25	-30	-29
Belgium	-2	-22	11	-15	-65
Malta	-6	26	62	6	-274
EU-27	12	15	36	28	12
Number of MS					
Below target	5	8	1	8	14
More than 30% above target	1	3	11	10	2

Source: EEA.

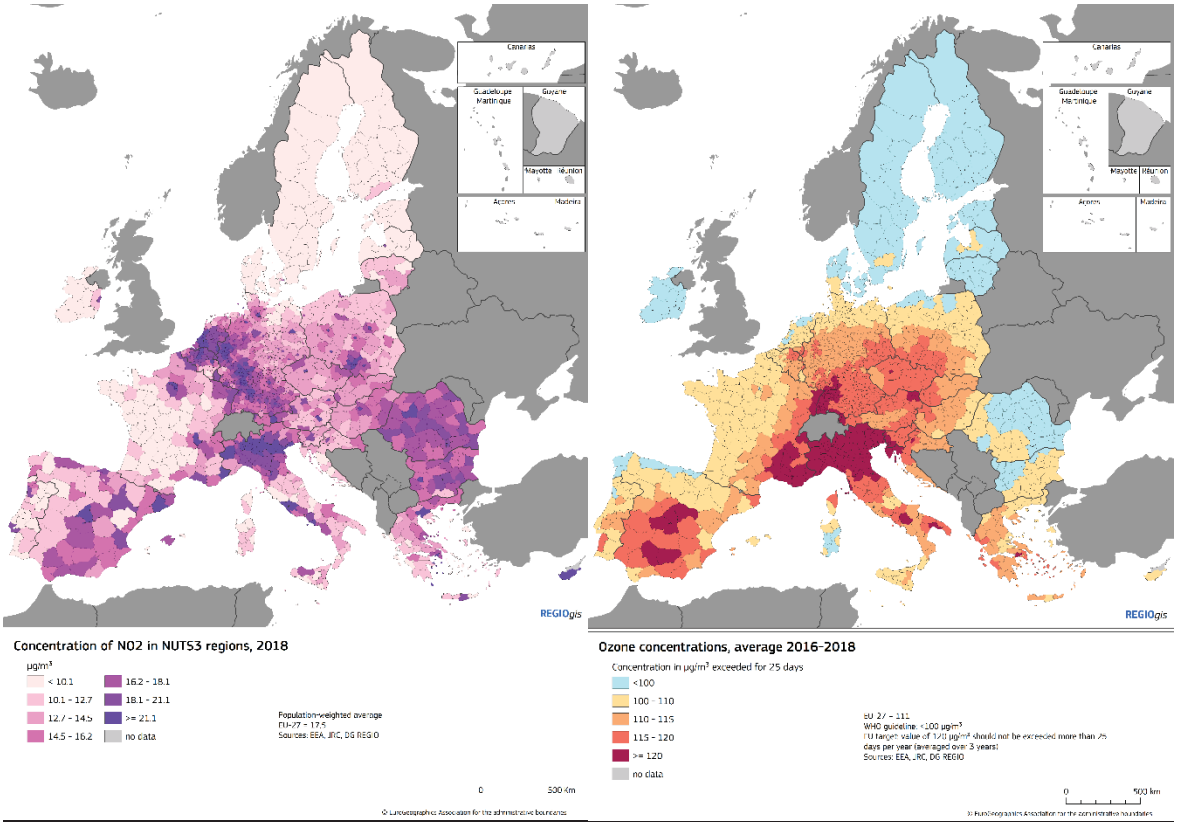
Note: The table shows how much emissions still need to be reduced to comply with the 2030 emission ceilings. Positive figures (in red) mean that further reductions are needed. Negative figures (in green) mean the emissions are below the ceiling. The required emission reduction is calculated as the percentage difference between 2019 reported emissions and the emission reduction commitments for 2030 onwards.

Although at EU level air pollutant emissions have been reduced, there are large regional differences regarding air quality (Map 3-10 and Map 3-11).

Map 3-10 Concentration of airborne particulate matter (PM2.5 and PM10), NUTS3, 2018



Map 3-11 Concentration of NO_2, 2018 and ground level ozone, average 2016 to 2018[6], NUTS3



High concentration of airborne particulate matter is caused by emissions from diesel engines or from coal mining, agriculture and other heavy industry. It is also affected by atmospheric conditions, as pollution levels rise with sunshine and high temperatures. In some places, burning wood, coal and other solid fuels in domestic stoves, especially during winter, also leads to locally high fine particulate matter emissions (notably of PM2.5)[7]. Accordingly, high concentrations of particulate matter are mostly observed in Eastern and Southern Europe and parts of industrial and densely populated regions of Italy, Germany, Belgium and France (Map 3-10).

The most prominent source of NO2 is the burning of fossil fuels in internal combustion engines, though also in heating and power plants. Emissions of NO2, therefore, come mainly from motor vehicles, though also from non-combustion processes, such as welding, the manufacture of nitric acid and the use of explosives. Moreover, in street 'canyons', where

6 O3 concentrations can be very volatile as they are highly dependent on meteorological conditions. It is therefore more relevant to report a three year average which is also the time span adopted in the Air Quality Directive of 2008 to set the target for protection of human health.

7 It is estimated that solid fuel combustion in households is responsible for under 3% of total energy consumption in the EU but for over 45% of emissions of primary PM2.5, i.e. three times more than road transport (Amann, M., et al. (2018), "Measures to address air pollution from small combustion sources", IIASA Report, International Institute for Applied Systems Analysis, Luxembourg, Austria).

streets are flanked by tall buildings and there is a large volume of traffic, nitrogen oxide emissions can be very high, leading to air quality standards for NO2 being exceeded.

In 2018, highest NO2 concentrations were found in the Netherlands, Belgium, Western Germany and Northern Italy (Map . High concentrations are also found in many Eastern and Southern regions, as well as in the EU core regions with high population density and a concentration of industry and transport networks (Map 3-11).

O3 is created by chemical reaction between oxides of nitrogen (NOx) and volatile organic compounds in the presence of sunlight. Consequently, O3 is most likely to reach unhealthy levels in hot sunny urban environments. High concentrations mostly occur in northern Italy, south and east of France, Spain but also in southern Germany, Czechia and part of Austria.

Exposure to pollutants is particularly high in urban areas, where most of the EU population lives. Since 2000, the percentage of urban citizens exposed to pollutant levels above EU standards set to protect human health has fallen[8]. However, poor air quality remains an issue and potentially harmful levels are still recorded in many areas.

This is particularly true for some pollutants like PM10 and O3, with respectively 10% and 21% of the EU urban population still exposed to levels above EU limit values in 2019. Exposure to other pollutants are less severe but still 3% of the urban population lived in zones exceeding the EU limit values for NO2 and 1% for PM2.5. For SO2, the percentage exposed to levels above the limit value has dropped to less than 0.1 % in the last ten years.

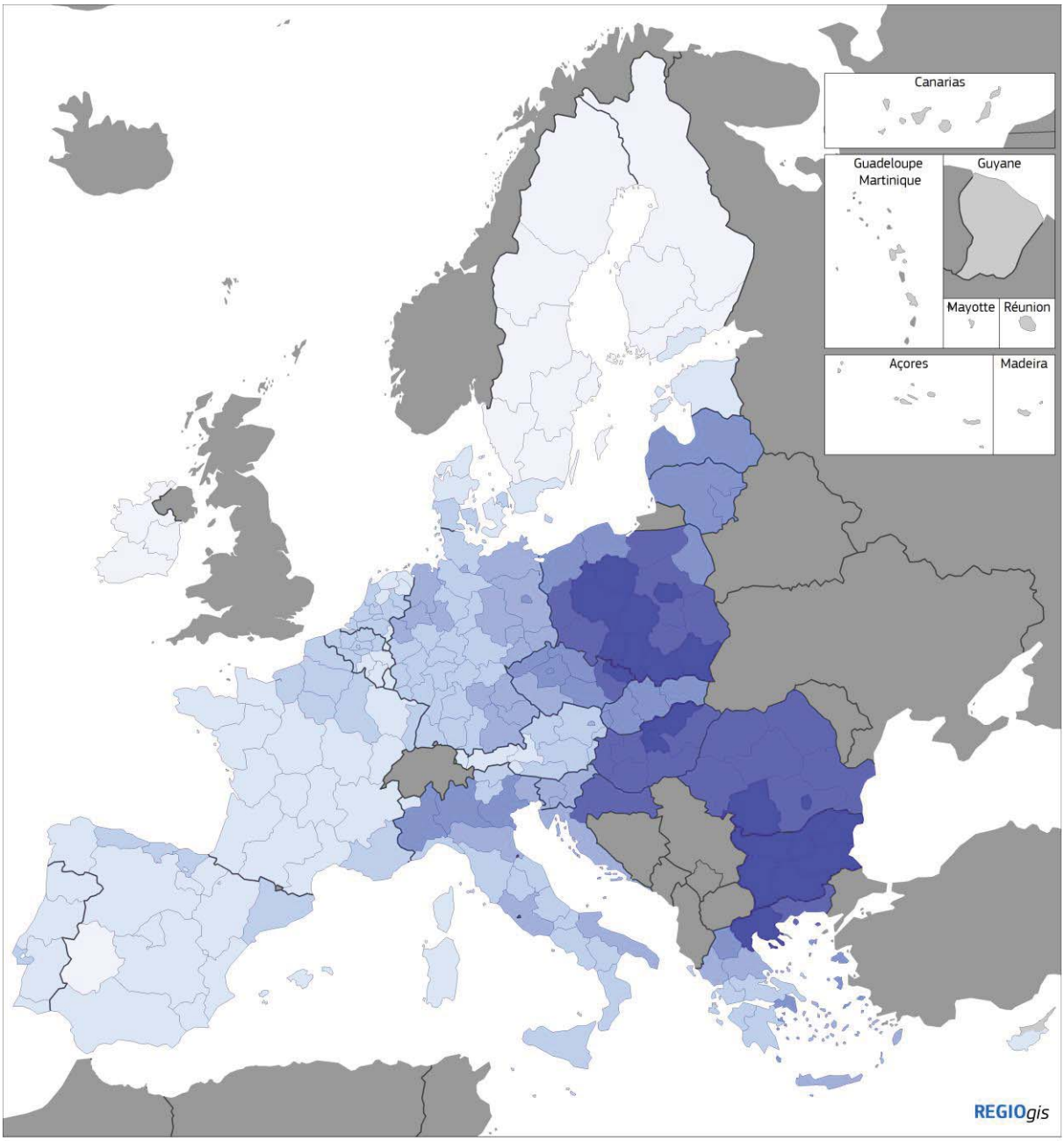
Exposure to air pollution can cause a wide range of diseases (cardiovascular problems, respiratory infections, aggravated asthma or cancer). It is estimated that exposure to PM2.5 is responsible for around 400 000 premature deaths in the EU every year, while in 2017 exposure to NO_2 and O_3 was responsible for around 70 000 and 15 000 premature deaths, respectively[9]. Those living in Eastern Europe are particularly at risk, with premature death rates reaching 174 per 100 000 inhabitants in Bulgaria and 133 in Hungary, well above the EU average of 79.

The areas where the impact on health from exposure to PM2.5 are greatest, in terms of years of life lost, are those with the highest concentrations, which also tend to be regions with low GDP per head (Map 3-12). There is, therefore, a strong link between low income levels and exposure to air pollution.

8 EEA (2021), Exceedance of air quality standards in Europe, https://www.eea.europa.eu/ims/exceedance-of-air-quality-standards.

9 European Environment Agency (2019), The European environment - State and outlook 2020 - Knowledge for transition to a sustainable Europe, Publications Office of the European Union, Luxembourg. https://www.eea.europa.eu/publications/soer-2020/chapter-08_soer2020-air-pollution/view

Map 3-12 Years of life lost due to exposure to PM2.5, 2018



Years of life lost attributed to exposure to PM 2.5, 2018

Years of life per 100 000 inhabitants

<= 400	1000 - 1250
400 - 600	1250 - 1500
600 - 800	> 1500
800 - 1000	no data

EU-27 = 870
Source: EEA

0 500 Km

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3.4.4. Rural areas are becoming more built up

Land cover

Sound management of land is essential for maintaining key productive resources and ecosystem services. Productive land and fertile soil are needed for providing food, allowing the nutrients cycle, protecting biodiversity, regulating and purifying water, and mitigating climate change.

Current land use practices and management affect the condition of land and soils and often result in loss of productive land. Unsustainable agricultural and forestry practices, construction of buildings and infrastructure and climate change are the main reasons for degradation of land.

Imperviousness

Soil sealing, or imperviousness, is a major concern, as it results in the loss of many of the functions that soil performs. The increase in imperviousness stems from new construction, which covers soils with impervious artificial material such as asphalt and concrete.

The extent of imperviousness varies considerably across the EU. It is highly correlated with population density, but imperviousness per inhabitant shows wide variations in land use between types of region.

Built-up land and transport infrastructure constitute the bulk of sealed areas. On average in the EU, as shown by the LUISA base maps[10], land classified as built-up areas and transport infrastructure per inhabitant is four times greater in rural areas than in cities (Figure 3-12). Built-up land and transport infrastructure in rural areas is relatively limited in Malta, Italy, the Netherlands, Slovakia, Luxemburg, Slovenia Poland and Romania, where it is less than 1 000 square metres per inhabitant, compared to Cyprus and Finland where it reaches 1 845 and 2 435 square metres, respectively.

Between 2012 and 2018, land classified as built-up areas and transport infrastructure in EU cities remained the same, while it increased significantly in rural areas. Here, the increase per head has been higher than in cities in almost all Member States (Figure 3-13). The biggest

[10] The LUISA Base Map (LBM) is an enhanced version of the CORINE Land Cover (CLC) map, consisting of a series of geospatial data fusion processes whereby highly detailed land use information from trusted datasets is integrated, with the CLC as the starting point. The LBM has a spatial resolution of 1 ha for built-up areas and 5 ha for non- built-up areas. However, the BLM is still based on the classification of relatively large areas and hence does not constitute a continuous land use measure. Also, although the same data sources are used to produce maps for both 2012 and 2018, input data may not always be fully comparable. This is especially the case for the accounting of changes in the urban fabric for geographical units such as municipalities or NUTS regions. However, the effect of differences in input data is limited because the LBM uses a robust approach taking account of multiple sources of information and classifies areas by broad classes of imperviousness.

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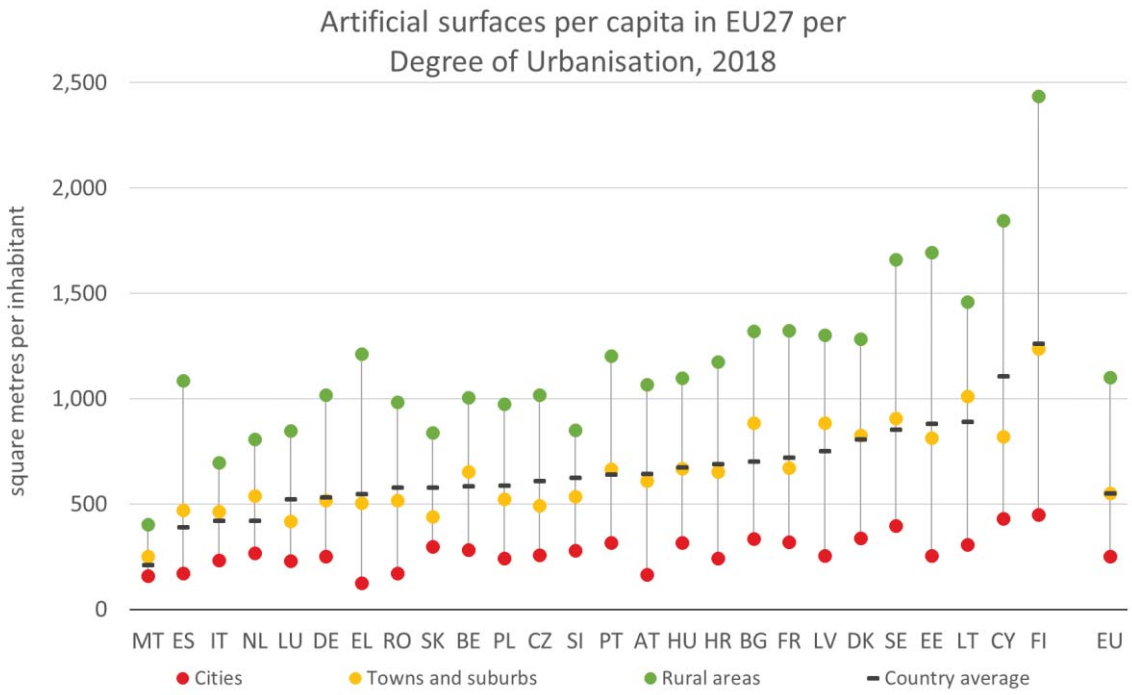
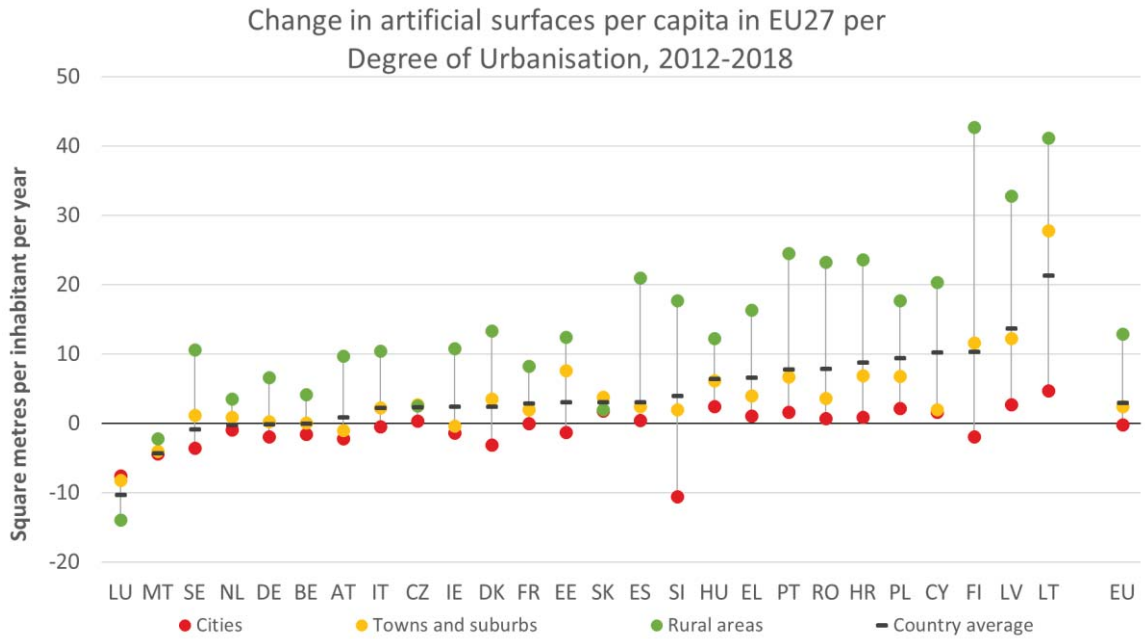
increases were in Finland and Lithuania, where they amounted to over 40 square metres a year on average. The above suggests that population growth in cities will have a smaller effect on the extent of built-up land and transport infrastructure than population growth in rural areas.

Figure 3-12 built-up land and transport infrastructure per head by degree of urbanisation, 2018



Source: JRC.

Figure 3-13 Change in built-up land and transport infrastructure per head by degree of urbanisation, 2012-2018



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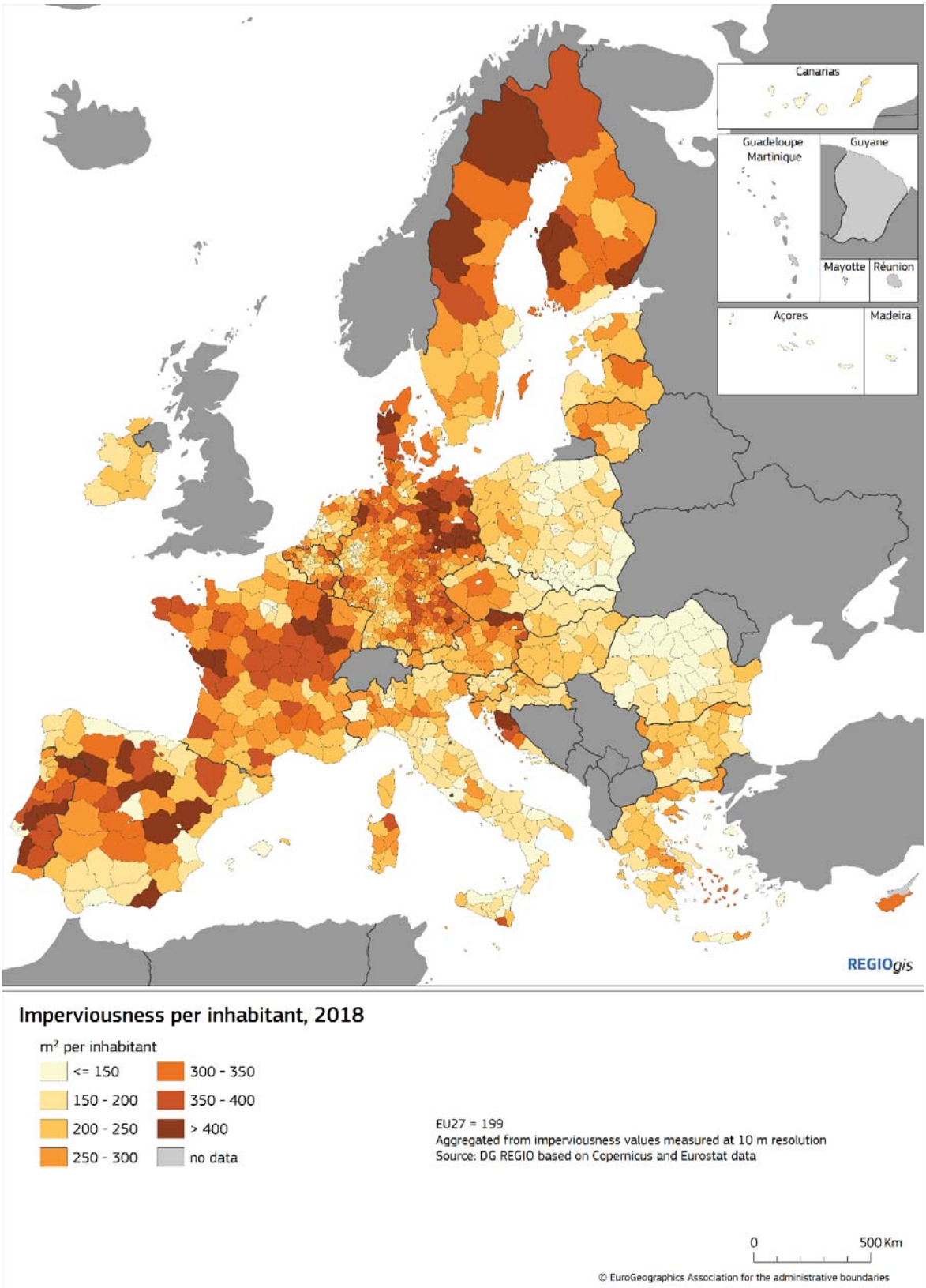
Source: JRC

There are also wide variations across EU regions, sealed areas per inhabitant being much lower in most regions in Eastern Europe than in some regions in France, Spain, Portugal and Germany (Map 3-13).

Map 3-13 Imperviousness per inhabitant, NUTS3, 2018



Land use dynamics: the case of agricultural land abandonment

Abandonment of agricultural land[11] is the largest change in land-use that is occurring in Europe. Agricultural land abandonment in mountainous and remote areas has been widely analysed, owing mainly to the depopulation of some rural areas, the low income and productivity of farming activities relative to new, non-farming opportunities, and the unfavourable natural constraints that need to be overcome (such as for instance the difficulties to cultivate on slopes)[12].

The consequences of land abandonment on biodiversity and other ecosystem services vary over time and between locations[13]. The most significant negative impacts can occur in areas where traditional, extensive land management practices have been maintaining high-biodiversity habitats and landscape features. Abandonment may alter the biological, geological, chemical and water cycles, along with change in the vegetation and the properties of the soil. It may result in an increase in the frequency of forest fires, soil erosion, landslides, desertification and the transformation of the landscape. It can also lead to revegetation, with new forest replacing herbaceous plants and shrubs, resulting in increased carbon sequestration, conservation of biodiversity, improvements in the quality and supply of water, recovery of the soil and stimulation of eco-tourism.

Recent projections[14] of the territorial patterns of land abandonment up to 2030, show that the proportion of agricultural land expected to be abandoned in EU NUTS3 regions varies from less than 2% to over 30% (Map 3-14). Almost 5% of NUTS3 regions are likely to have over 15% of their agricultural land affected by land abandonment. The areas most affected could be targeted by policymakers to prevent or minimise the adverse consequences and to foster appropriate forms of land management to create high quality natural areas[15].

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11 Agricultural land abandonment commonly refers to land that was previously used to grow crops or for grazing, does not have farming functions anymore; and has not been converted to forest or artificial areas either (see for instance Perpiña Castilloa, C., Jacobs-Crisionia, C., Diogo, V. and Lavalle, C. (2021), "Modelling agricultural land abandonment in a fine spatial resolution multi-level land-use model: An application for the EU", Environmental Modelling & Software, 136, https://doi.org/10.1016/j.envsoft.2020.104946.

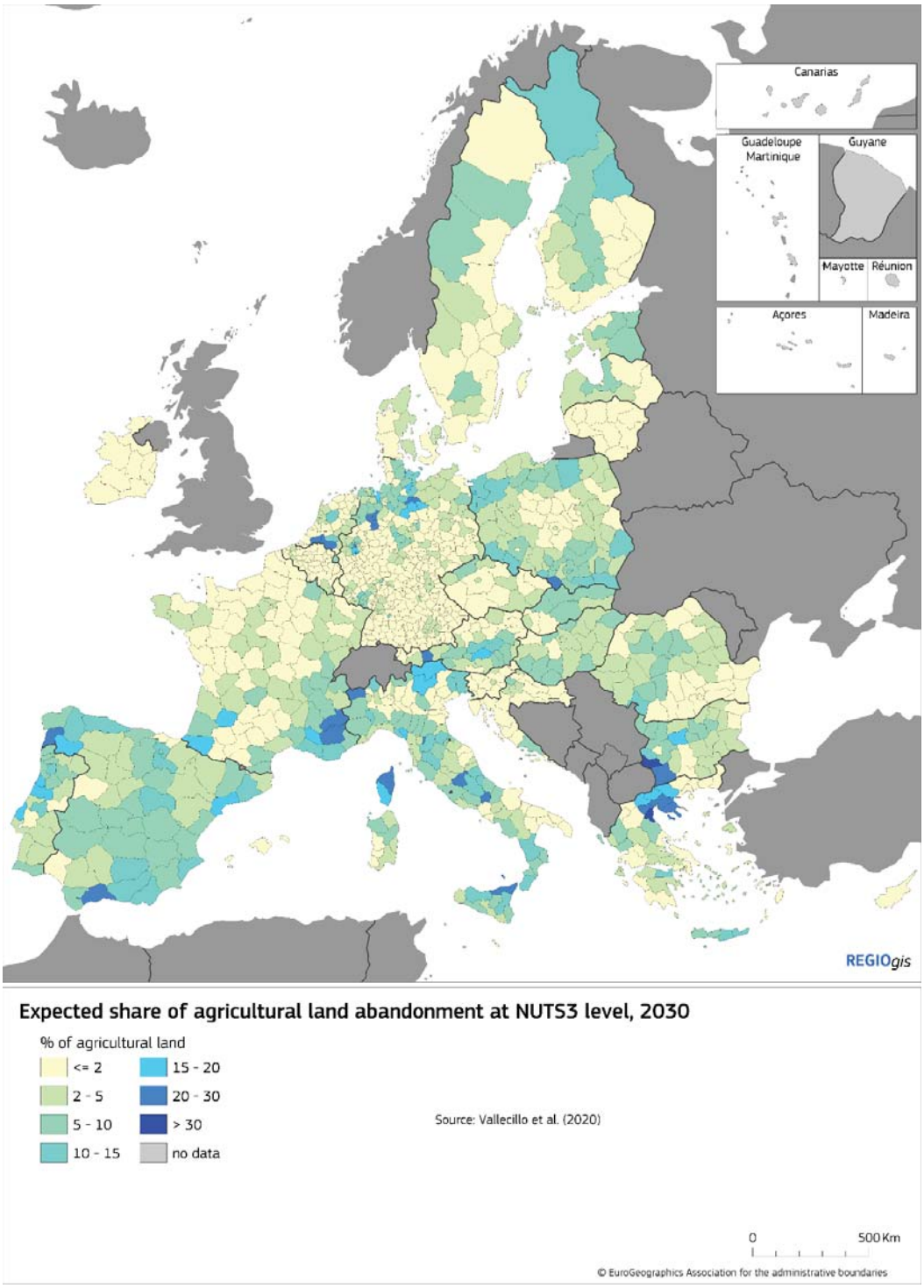
12 See for instance Lasanta, T., Arnáez, J.; Pascual, N., Ruiz-Flaño, R,. Errea, M.P., Lana-Renault, N. (2016), "Space-time process and drivers of land abandonment in Europe", Catena 149, 810–823.

13 Ustaoglu, E. (2018), "Farmland Abandonment in Europe: An Overview of Drivers, Consequences and Assessment of the Sustainability Implications", Environmental Reviews 26(4), DOI:10.1139/er-2018-0001.

14 Perpiña Castillo C., Kavalov B., Ribeiro Barranco R., Diogo V., Jacobs-Crisioni C., Batista e Silva F., Baranzelli C., Lavalle C. (2018), "Territorial Facts and Trends in the EU Rural Areas within 2015-2030", Publications Office of the European Union, Luxembourg, ISBN 978-92-79-98121-0, doi:10.2760/525571, JRC114016. Their projections are based on the LUISA Territorial Modelling Platform. LUISA is a pan-European modelling platform developed by the Joint Research Centre to generate alternative scenarios of territorial development in order to understand better the effects of certain EU policies in an integrated spatial framework.

15 For instance, areas facing natural or other specific constraints (ANCs) are those that are more difficult to effectively farm due to specific problems caused by natural conditions. In order to prevent this land from being abandoned, the EU provides support through both rural development and income support schemes.

Map 3-14 Expected shares of agricultural land abandonment, 2030



3.4.5.More investment needed to restore ecosystems, develop green infrastructure and nature-based solutions

Biodiversity and nature are essential to maintaining life by providing ecosystem services, such as the provision of food, pollination, carbon sequestration, mitigation of natural disasters and recreational opportunities. As a result, loss of biodiversity has fundamental consequences for society, economy and human health and well-being.

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Despite efforts, the EU is continuing to lose biodiversity at an alarming rate and many EU policy targets will not be achieved. In particular, there has been limited progress towards the 2020 target of improving the conservation status of habitats, covered by the EU Habitats Directive, and the target for bird populations under the Birds Directive. For example, 60% of the species and 81% of the habitats protected under the Habitats Directive are assessed as having a poor or bad conservation status[16]. Recent assessments indicate that the loss of biodiversity and ecosystem services continues across the EU.

There has been some progress, however, notably in the designation of protected areas. The EU Natura 2000 network, aimed at safeguarding Europe's most valuable and threatened species and habitats, now covers 18 % of the EU land area and almost 9 % of sea, making it the world's largest network of protected areas.

The Natura 2000 network is now largely complete on land, though some Member States still need to propose further sites for a number of species and habitats to complete their national network. Progress in designating Natura 2000 sites in the marine environment, however, has been much slower. This is largely because of lacking scientific information on the distribution of protected marine habitats and species at the level of detail required for sites to be identified and appropriate management to be introduced.

Under its biodiversity strategy for 2030[17], the EU will implement a series of measures to reverse these trends. These include placing at least 30% of land and 30% of sea areas in the EU under protection, restoring degraded ecosystems, increasing organic farming and biodiversity-rich landscape features on agricultural land, restoring at least 25 000 km of EU rivers to a free-flowing state, halting and reversing the decline in pollinators, planting 3 billion trees and reducing the use and risk of pesticides by 50% by 2030. In order to boost ecosystem restoration efforts, the Commission will propose, in 2022, an EU Nature Restoration Law.

Nature-based solutions tap into ecosystem restoration in order to tackle major societal challenges, while also providing benefits for biodiversity. Some examples of nature-based solutions include investments in:

- wetland and floodplain restoration in order to mitigate flood risk and improve water regulation, while also providing habitat for valuable plant and animal species, fish-spawning grounds, nutrient reduction benefits, groundwater replenishment and recreation opportunities.

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16 EEA (2020), Habitats and species: latest status and trends, https://www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/habitats-and-species-latest-status.

17 COM/2020/380 final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Biodiversity Strategy for 2030 Bringing nature back into our lives.

- high-diversity landscape features on agricultural land that can increase ecological connectivity, provide a mosaic of habitats, allow species to migrate and adapt to climate change, while at the same time enhancing ecosystem services such as pollination, climate and water regulation, and erosion protection.
- urban green areas that can support and reconnect wildlife while also helping to mitigate flooding, urban heat and air pollution, and providing recreation opportunities.

Ecosystems deliver services which bring value to the economy, captured by ecosystem accounts. The European Commission's INCA project provided an initial estimate of the economic value provided by a set of seven ecosystem services in the EU in 2019, amounting to EUR 234 billion, which is comparable to the gross value added of agriculture and forestry combined[18].

Healthy ecosystems play an important role in regulating the water cycle and controlling river flooding. Even where flood defence structures are in place, ecosystems such as wetlands and restored and reconnected floodplains act together to reduce flood peaks and keep them within safe limits. Ecosystems with the highest potential to reduce run-off are wetlands and flood plains, followed by woodland and forest.

In recent years (see sections 3.3.2 and 3.3.3), losses from river floods have increased considerably because of the location of economic activity in flood plains in combination with heavier rainfall in some regions[19]. According to a recent study, some 13% of built-up areas in the EU are located in flood plains, so requiring protection from floods[20]. Sustainable ecosystem management to reduce the risk of floods is, therefore, recognised as a priority measure under the Sendai Framework for Disaster Risk Reduction[21].

The value of the protective role performed by ecosystems against floods is estimated at around EUR 16 billion, the equivalent to EUR 823,000 per square km of built-up area in flood

---

18 Vysna, V., Maes, J., Petersen, J.E., La Notte, A., Vallecillo, S., Aizpurua, N., Ivits, E., Teller, A., (2021), "Accounting for ecosystems and their services in the European Union", Final report from phase II of the INCA project aiming to develop a pilot for an integrated system of ecosystem accounts for the EU, Publications office of the European Union, Luxembourg. https://ec.europa.eu/eurostat/en/web/products-statistical-reports/-/ks-ft-20-002

19 European Environment Agency (2016), "Flood risks and environmental vulnerability: Exploring the synergies between floodplain restoration, water policies and thematic policies", Luxembourg: Publications Office of the European Union, https://www.eea.europa.eu/publications/flood-risks-and-environmental-vulnerability.

20 Vallecillo, S., Kakoulaki, G., La Notte, A., Feyen, L., Dottori, F. and Maes, J. (2020), "Accounting for changes in flood control delivered by ecosystems at the EU level", Ecosystem Services, 44. https://doi.org/10.1016/j.ecoser.2020.101142. Built-up areas corresponds to CORINE Land Cover map, Level 1 Artificial surfaces (see CLC nomenclature https://land.copernicus.eu/eagle/files/eagle-related-projects/pt_clc-conversion-to-fao-lccs3_dec2010).

21 United Nations (2015), Sendai Framework for Disaster Risk Reduction 2015-2030.

plains. The ecosystem deficit shows that for 68% of these areas, or 9% of the total built-up area in the EU, flood risk could be reduced by improving upstream ecosystems (Map 3-15).

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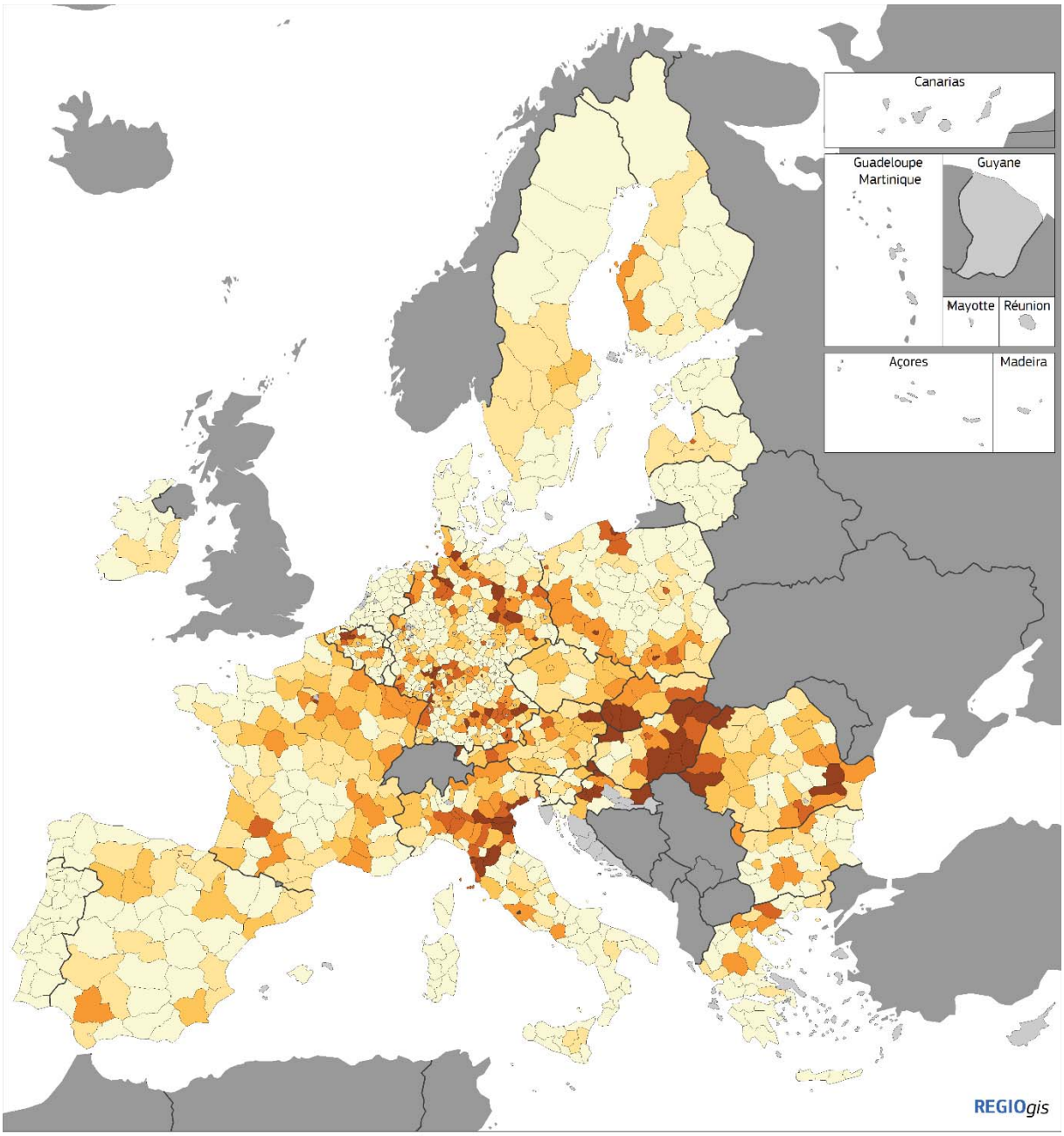
Map 3-15 Built-up areas where improved ecosystem services could reduce flood risk, 2012



Artificial areas with ecosystem deficit, 2012

%

<= 2
2 - 4
4 - 6
6 - 9
9 - 14
>14
no data

Source: JRC

0 500 Km

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A reduction in the ecosystem deficit to protect settlements against floods could significantly reduce the frequency of floods, as indicated by the correlation of the latter with this deficit

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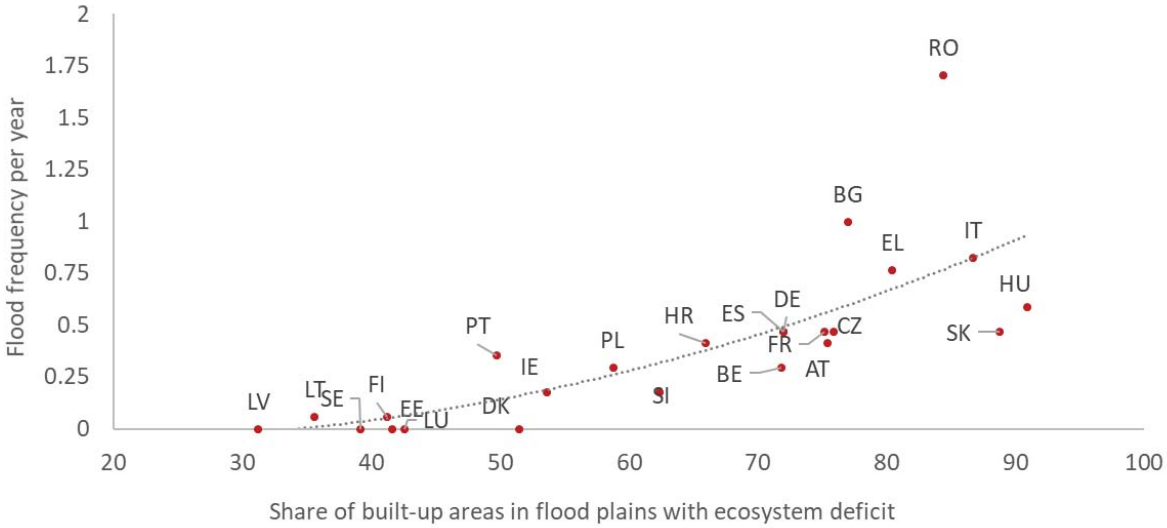
(Figure 3-14). This highlights the importance of the role of ecosystems in mitigating flood damage.

Figure 3-14 Relationship between the share of built-up areas in floodplains with ecosystem deficit and flood frequency



Source: JRC.

Green infrastructure can also play a key role in mitigating other consequences of climate change such as for instance the increase in the severity of the urban heat island effect.

Surface and air temperatures are generally higher in cities than in rural surroundings. Built-up areas trap more solar radiation than natural vegetation with a consequent rise in temperature. It is not exceptional that certain areas in cities are several degrees warmer than the countryside during summer. Heating and transport further increase the heat released in urban areas. These urban heat islands can become so warm during heat waves that they increase the risk of heat-related human illnesses and mortality. Increasing urbanisation and more frequent heatwaves as a result of climate change are expected to increase further the impact of urban heat islands in the next decades.

Vegetation in and around cities, such as trees, urban parks, and forests, mitigate extreme urban temperatures. Not only do trees provide shade, they also cool the surrounding area by evaporating water through their leaves.

The impact of urban vegetation on urban temperature can be measured using in-situ weather stations, which monitor the air temperature, as well as through remote sensing of the land surface temperature. Land surface temperature data, collected for 601 functional urban areas in Europe, are used in a model to estimate the effect of urban and peri-urban vegetation in temperature reduction (Map 3-16)[22]. The results suggest that on average,

[22] Maes, J., Quaglia, A., Martinho Guimaraes Pires Pereira, A., Tokarski, M., Zulian, G., Marando, F. and Schade, S. (2021), "BiodiverCities: A roadmap to enhance the biodiversity and green infrastructure of European cities by 2030", EUR 30732 EN, Publications Office of the European Union, Luxembourg, doi:10.2760/288633, JRC125047.

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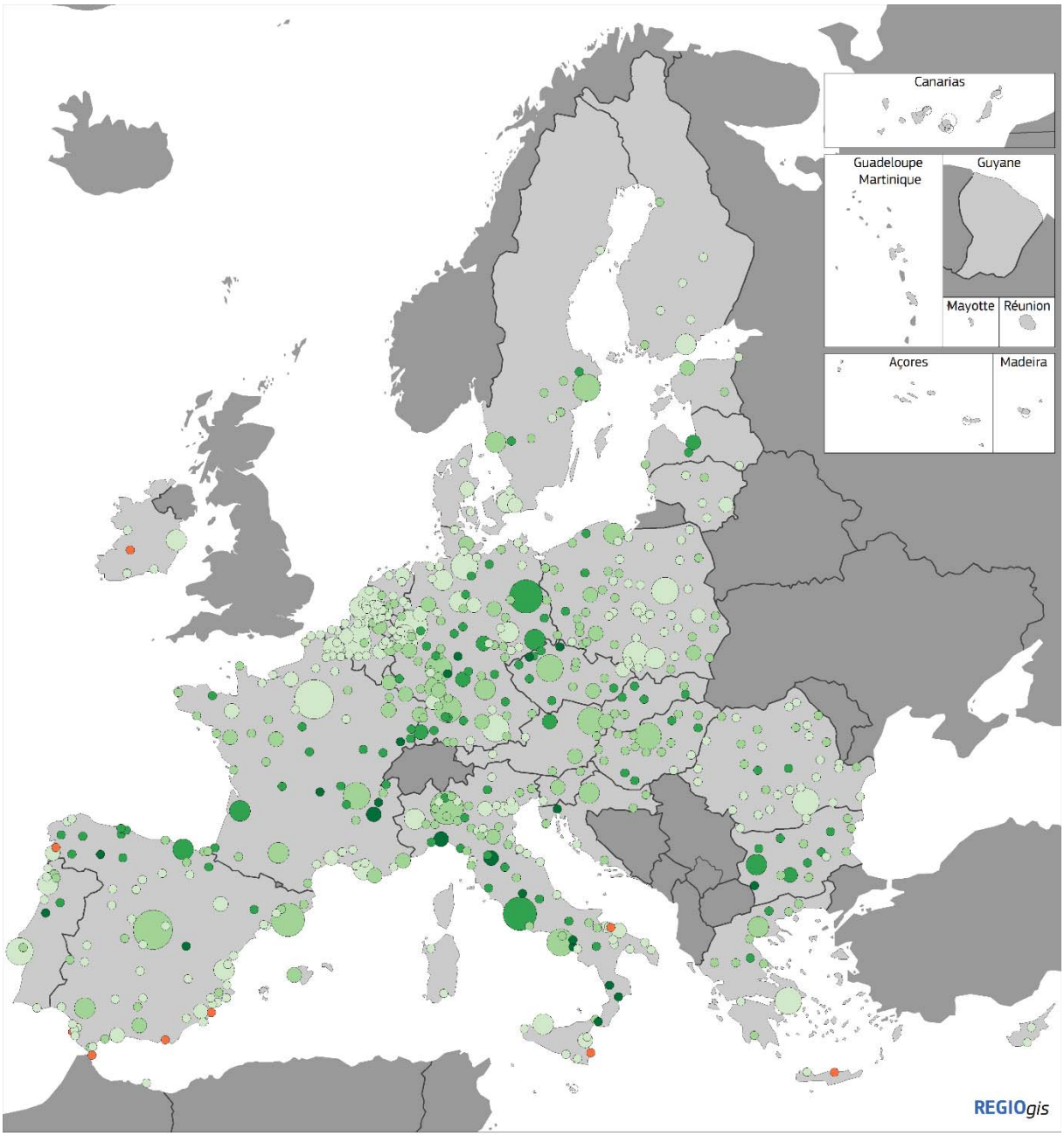
European cities would be up to 5°C hotter in a no-vegetation scenario. On average, urban vegetation cools cities by 1.07 °C. In cities distant to the sea, the impact of vegetation on temperature reduction is, in general, higher than in coastal cities. In a few cases, urban green spaces can be hotter than the built-up area, in particular in Mediterranean cities where the cooling capacity of urban trees and forests decreases during extended periods of water scarcity.

The cooling effect of vegetation in cities is local and limited to green areas. Therefore, almost half of the urban population does not live close enough to urban green areas to benefit from temperature reduction by trees and urban forests., especially in cities where urban green areas are scarce. Increasing tree cover in cities can be an effective strategy to reduce the heat intensity in cities[23]. As a rule of thumb, adding a proportion of tree cover equal to 16% of the functional urban area will reduce the average urban temperature by 1°C.

[23] The results of the LIFE projects VEG-GAP identify best vegetation choices for urban green, e.g. avoiding vegetation that emits ozone precursors.

Map 3-16 Cooling effect of vegetation in functional urban areas, 2018



Cooling effect of vegetation in FUAs, 2018

°C
- < 0
- 0 - 1
- 1 - 1.5
- 1.5 - 2
- >= 2
- No data

FUA population
- < 500 000
- 500 000 - 1 000 000
- 1 000 000 - 2 000 000
- 2 000 000 - 4 000 000
- 4 000 000 - 6 000 000
- >= 6 000 000

Source: JRC

0 500 km

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PART 6/16

COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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CHAPTER 4 A MORE CONNECTED EUROPE – PART 1

- For journeys between EU cities of up to 500 km, rail has the potential to successfully compete with short haul flights in terms of total travel time, provided that a sufficient rail operating speed can be achieved. Speeds of around 140 km per hour appear to be sufficient for rail to consistently outperform air flights for trips of this distance or less.
- For journeys in the EU of up to 90 minutes, cars are usually a better option than trains. Nevertheless, in most eastern Member States more investment in the road network could still substantially improve accessibility. By rail it tends to take much longer to reach destinations, particularly in rural and border areas, but the total travel time of a rail trip can often be significantly reduced by cycling to and from stations.
- Within metropolitan areas, the ability to reach nearby locations by car is strongly affected by congestion. Fortunately, the majority of the people living in cities in the EU have good access to public transport, though when suitable infrastructure is in place, bicycles can be a much quicker way of reaching nearby destinations than public transport.
- The EU aims to cut road traffic fatalities by at least 50% between 2020 and 2030, reducing them to less than 25 per million inhabitants. There are only a few regions where the rate at present is this low, highlighting the need for a coordinated effort to improve transport infrastructure and user behaviour. By lowering speed limits, many cities now have a fatality rate well below the 2030 target, but road safety needs to improve further to meet the 2050 vision of zero fatalities.
- Broadband connections in the EU show a clear digital divide both between rural and urban areas and between less developed and more developed regions. The provision of digital services and the capacity to operate successfully in a global business environment increasingly rely on fast and effective broadband connections. Unless the gap is closed, the competitiveness of less developed and rural areas is likely to deteriorate, leading to even greater disparities.

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Chapter 4 A MORE CONNECTED EUROPE – PART 1

Mobility of people is an enabler of economic and social life. Well-targeted infrastructure investment and network design are crucial for a transport system that provides accessibility to people and businesses, as well as for reducing regional disparities in connectivity.

Despite the benefits, mobility involves costs to society. These include emissions of greenhouse gas and pollutants, but also accidents and congestion, all of which affect health and wellbeing. The EU transport strategy is currently focused on the transition to sustainable and smart mobility,[1] which involves reducing significantly its greenhouse gas emissions, and *inter alia* requires a decisive shift in modes of transport.

This chapter shows that, in terms of accessibility and connectivity, rail passenger transport in particular has the potential to be a substitute for short-distance flights and road journeys between cities, provided that network design, service frequency, and travel speed are sufficient to make it an attractive alternative.

In the urban environment, congestion poses another important challenge. Here, the potential for more sustainable modes, including public transport and non-motorised means of moving around, is very high due to the concentration of population and shorter journey distances.

This chapter also covers other aspects of a sustainable passenger transport system, including electric vehicle charging infrastructure and road safety. Importantly, an increase in road safety might boost the take-up of non-motorised modes of transport, bicycles in particular, which in turn would further contribute to low-emission mobility.

Finally, the chapter focuses on broadband connections, which, in an increasingly digitalised world, have become an important aspect of connectedness. Good coverage and fast digital connections are important in all areas, especially in remote or sparsely populated ones, where transport networks are less developed and digital connectivity can play an important role in ensuring access to essential services.

4.1 RAIL CAN COMPETE WITH SHORT HAUL FLIGHTS[2]

In 2021, the Commission proposed an action plan to boost long-distance and cross-border passenger rail services. This builds on efforts by Member States to make key connections between cities faster by better managing capacity, coordinating timetabling, creating facilities for sharing rolling stock and improving infrastructure to stimulate new train services, including at night.[3]

[1] COM(2020) 789 Final
[2] The analysis in this section focuses on a comparison of travel times and does not look at other aspects relevant to transport mode choices such as transport prices, comfort and safety.
[3] EC(2020) Sustainable and smart mobility strategy – Putting European transport on track for the future. COM(2020) 789 final.

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Improving high-speed rail[4] services could provide travellers with an alternative to short-haul flights, which would not only reduce CO_2 emissions but also free up scarce airport capacity and avoid maintaining unprofitable air routes. Depending on operating speed, boarding time[5], taxiing time and travel time to reach the airport or station[6], high-speed rail can be a viable alternative to air travel up to distances of 500 km.[7]

High-speed trains account for 31% of total passenger-kilometres by rail in the EU.[8] In France and Spain, it is close to 60%. However, over half of Member States do not yet have any high-speed railway lines at all.

For the 1 356 rail connections between EU cities with 200 000 inhabitants or more, or which are national capitals, and located within 500 km of each other, the speed of the fastest train service[9] is considerably less than that of high-speed rail (Map 4-1 and Figure 4-1). On only 3% of these lines is the speed above 150 km an hour. The proportion is the largest in the south of the EU, where both Italy and Spain have a well-developed high-speed rail network. In the north-west, the number of high-speed connections, which are mainly in France and Germany, is similar but the proportion is smaller. Because of higher population density, the rail network is denser with more short distance connections with lower speeds. Nevertheless, the north-western EU has the largest proportion of rail connections faster than 90 km an hour and only a few pairs of cities without any connection at all. The rail network is less developed in the eastern EU, with no connection between 20% of city-pairs and no connections with speeds above 150 km an hour. Indeed, on most routes the speed is still below 60 km an hour.

[4] A high-speed train, as defined by Eurostat, is "*a train designed to operate at a speed of at least 250 km/h on dedicated high speed lines*", and a tilting high-speed train as "*a train with a tilting system designed to have an operating speed of 200 km/h or above on upgraded high speed lines*".

[5] The time between arrival at the airport or rail station and the actual departure.

[6] Rail stations tend to be located in or very close to urban areas and so to be more accessible than airports.

[7] Some authors consider a viable distance for high-speed rail to be up to 1000 km, or even 2000 km if night trains are considered (see e.g. Rothengatter et al., 2011; Chiara et al, 2017; Sun et al., 2017. htttps://www.hindawi.com/journals/jat/2018/6205714/)

[8] This figure relates to all high-speed trains including tilting trains able to travel at 200 km an hour, which do not necessarily require high-speed infrastructure.

[9] The fastest service available for departure during a weekday in 2019 between 6:00 and 20:00.

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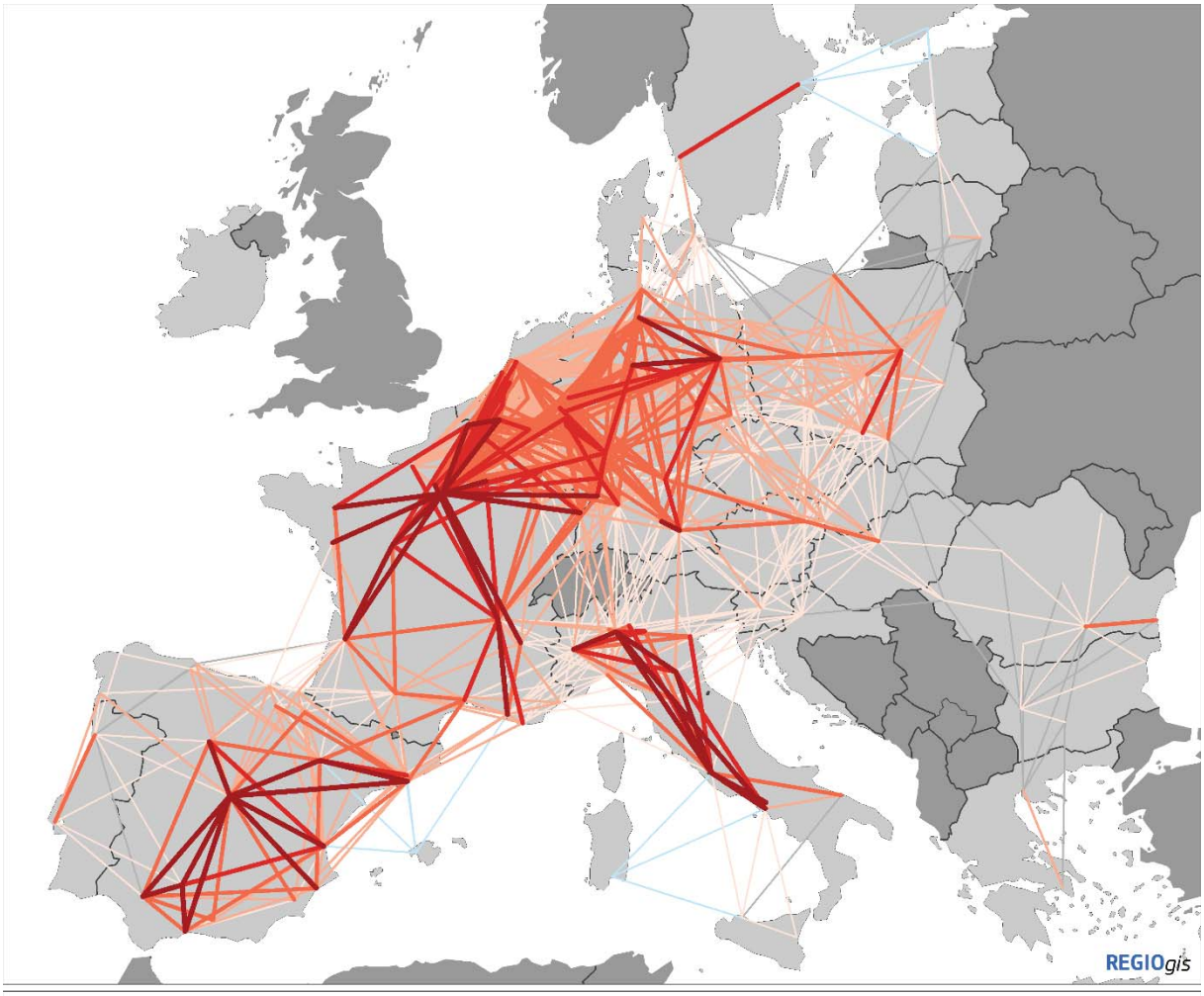
Map 4-1: Speed of rail connections between major urban centres in the EU, 2019



Speed of rail connections between major urban centres in the EU, 2019

km/h

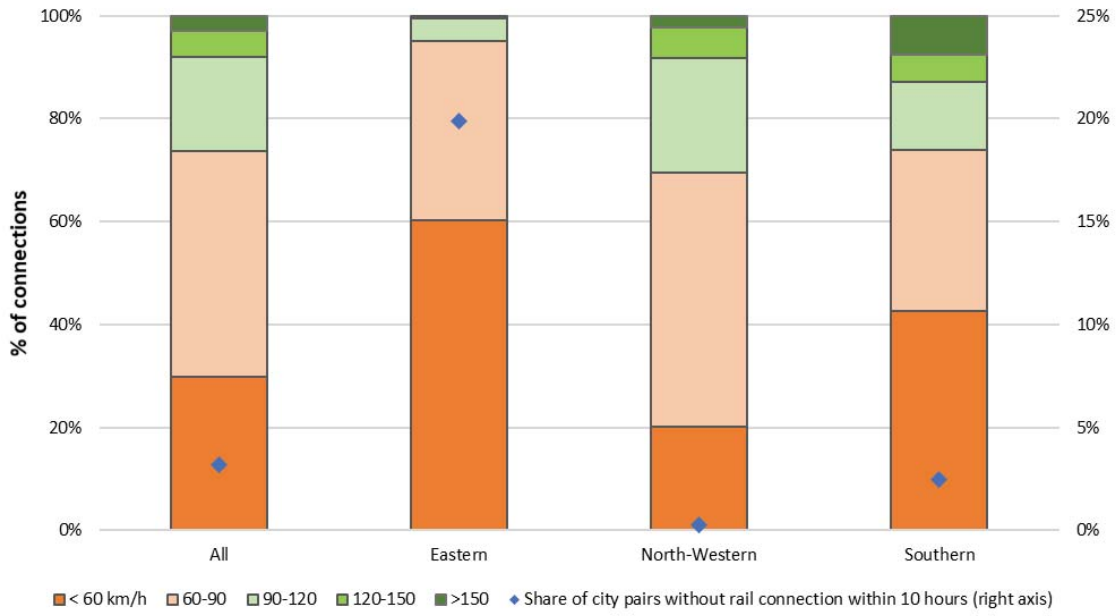
- < 60
- 60 - 90
- 90 - 120
- 120 - 150
- > 150
- no connection within 10 hours
- overseas*

Speeds are based on optimal travel time on a weekday relative to the straight-line distance.
Only urban centres located within 500 km from each other were considered.
In addition, each pair of urban centres must contain an urban centre that has more than 500 000 inhabitants (or represents the national capital) and the other urban centre has to have at least 200 000 inhabitants.
*Overseas: links between city pairs involving a sea crossing where neither a fixed railway link or a train ferry is available.
Sources: DG REGIO based on data from UIC, national and regional rail operators, JRC

0 500 Km

© EuroGeographics Association for the administrative boundaries

Figure 4-1: Speed of rail connections between urban centres by geographic region, 2019



Source: DG REGIO
Note: Only pairs of urban centres located within 500 km from each other are considered. In addition, urban centres has to have at least 200 000 inhabitants.

The share of connections with speeds above 150 km an hour is larger between large urban centres, i.e. with populations of over 500 000, (7%) than between small ones, with populations of 200 000-500 000 (1%) or between large and small centres (3%) (Figure 4-2). There is a similar difference for the share of connections with speeds of over 90 km an hour (36% between large city pairs and 19% between small ones). Despite some progress towards technical inter-operability, rail travel across EU borders is still hindered by many obstacles. The rail network has numerous gaps where the national railways are not properly connected.[10] Over 5% of city pairs in different countries are not connected by rail, against only 0.3% of pairs of cities in the same country (Figure 4-3).[11] Speeds on cross-border connections also tend to be lower than on domestic connections. About 40% of the former have speeds below 60 km an hour compared to 16% of the latter. Moreover, only 0.4% of cross-border connections have speeds of over 150 km an hour.

[10] EC(2018) Comprehensive analysis of the existing cross-border rail transport connections and missing links on the internal EU borders

[11] It should be noted that these routes, whether cross-border or domestic, may be served by long-distance bus connections, which could be a reason for there being no rail connection.

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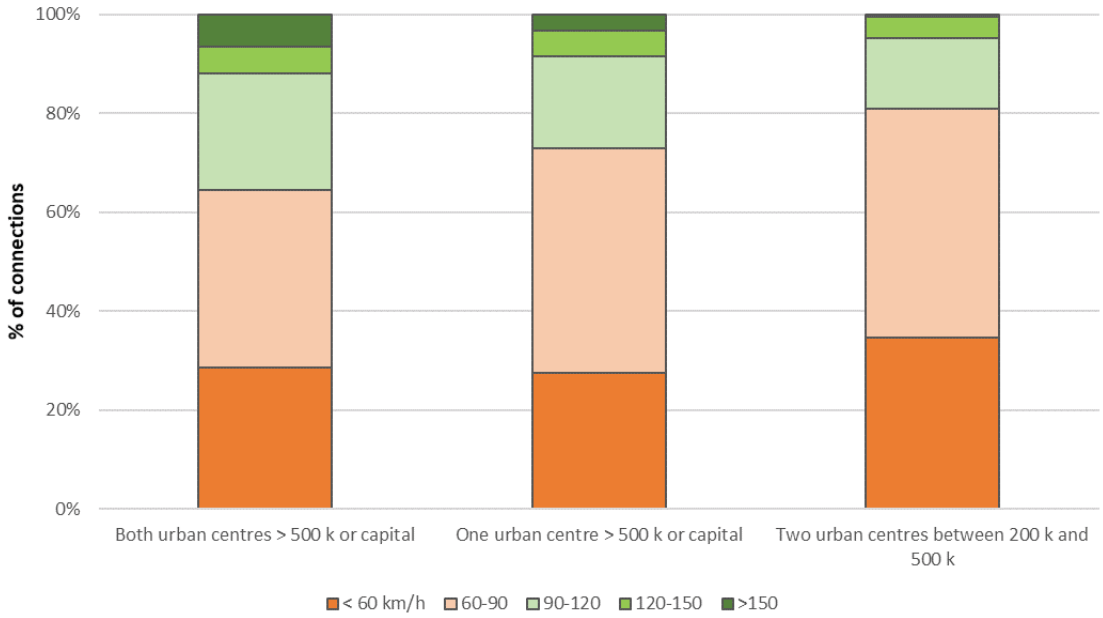
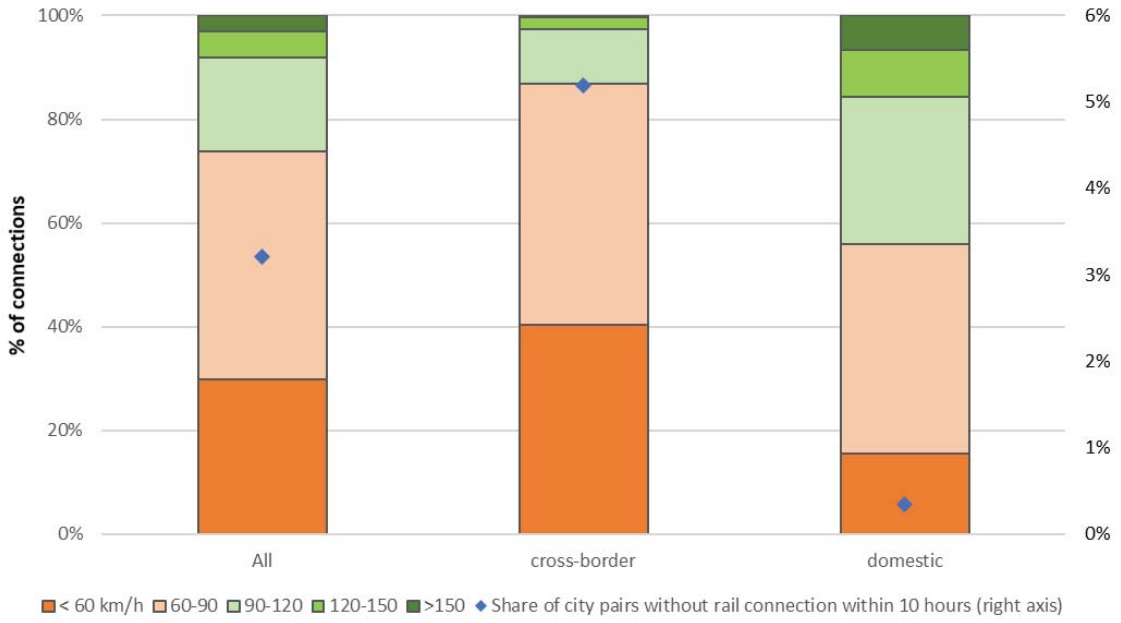
Figure 4-2: Speed of rail connections between urban centres by population size, 2019



Source: DG REGIO
Note: Only pairs of urban centres located within 500 km from each other are considered. In addition, urban centres has to have at least 200 000 inhabitants.

Figure 4-3: Speed of cross-border and domestic rail connections between urban centres, 2019



Source: DG REGIO
Note: Only pairs of urban centres located within 500 km from each other are considered. In addition, urban centres has to have at least 200 000 inhabitants.

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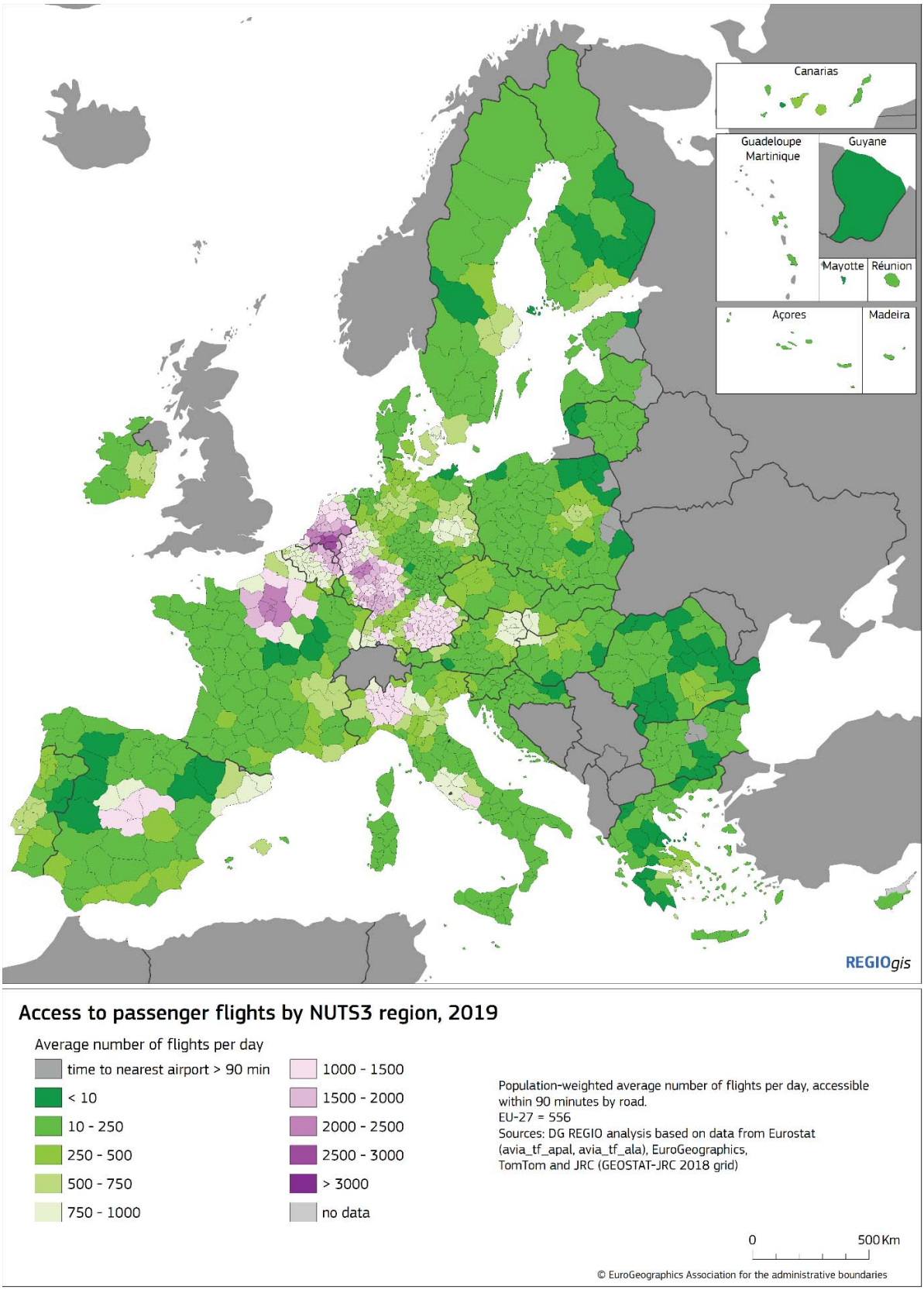
Map 4-2: Access to passenger flights by NUTS3 region, 2019



On average, EU citizens have access to 556 flights within 90 minutes of driving time. However, access to passenger flights is highly uneven across the EU, ranging from a number of regions in the south

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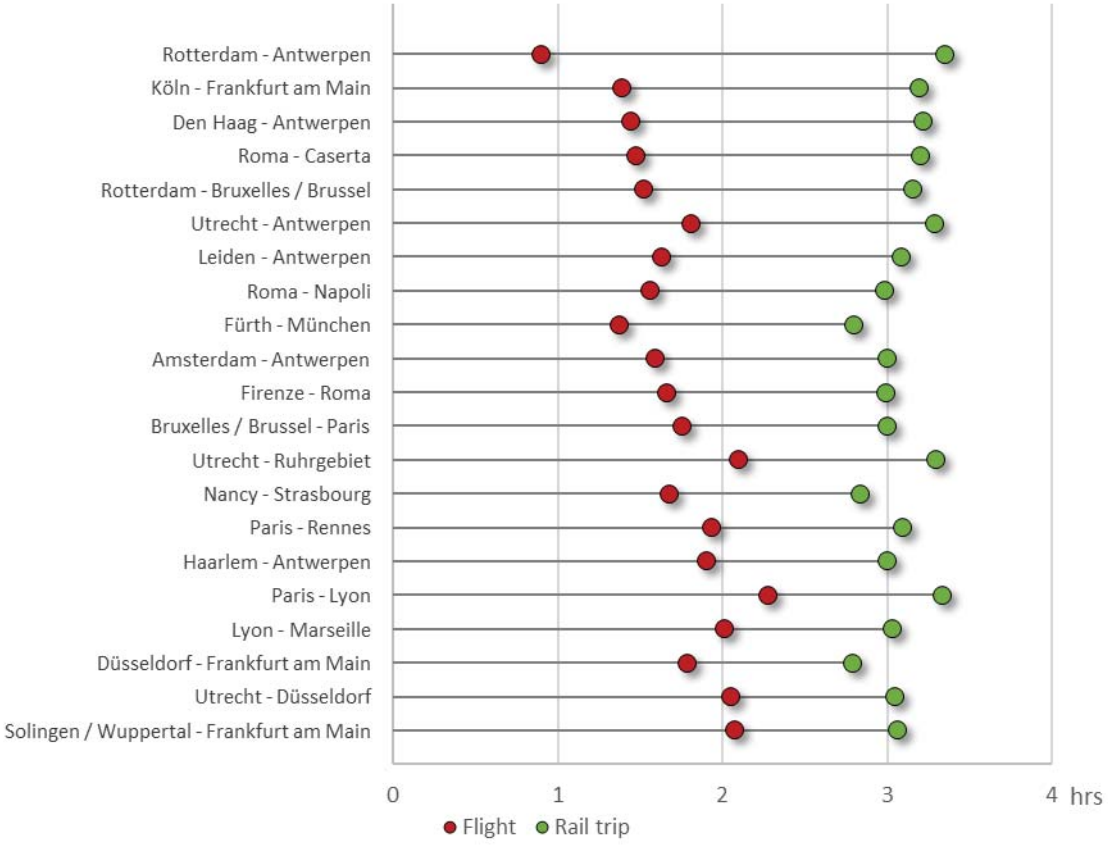
of the Netherlands, where people have access to over 2,500 flights a day, to regions in eastern Poland, Bulgaria, Estonia and Latvia, where inhabitants have no access to any flights within 90 minutes driving time (Map 4-2). Access to flights is notably greater in regions close to large urban centres, capital cities in particular, where large airports tend to be located.

As indicated above, any realistic comparison of travel by train with travel by air has to take account of differences in the time needed for accessing airports or rail stations, waiting times and actual departure and arrival times[12]. Some 297 connections between EU cities[13] within 500 km of each other are served by both rail and air. On 68 of these routes, the total travel time by rail is shorter than that by air and on 21 of them, the difference is an hour or more (Figure 4-4). The routes concerned are mainly in and between the Netherlands, Belgium, Germany and France but also include three domestic connections in Italy.

Figure 4-4: Total travel time by rail and air on selected routes (hours), 2019



Routes are ranked by the difference in travel time between rail and air
Source: DG REGIO, DG JRC based on SABRE airline data

[12] The assumptions used for the present analysis are as follows. Time before boarding the first train: 15 minutes; check-in and boarding at the departure airport: 60 minutes; taxiing is assumed to be included in the flight time: 30 minutes; transfer time at the arrival airport: 30 minutes. A flight speed of 500 km an hour is assumed. If more than one connection between airports is available linking the same urban centres, the travel time of the connection with the highest number of passengers is taken.
[13] As before, this concerns pairs of urban centres with at least 200 000 inhabitants each or which are capital cities, and are located less than 500 km from each other.

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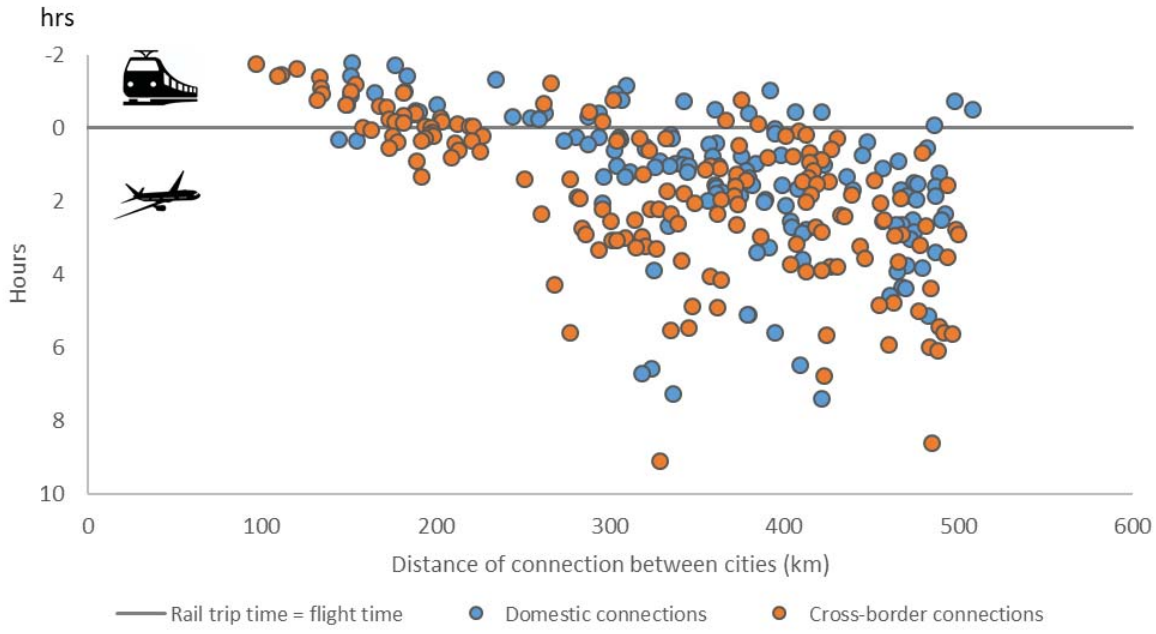
Although planes tend to outperform trains for distances of over 300 kilometres, there are still many routes of this distance where the reverse is the case (Figure 4-5). This indicates that rail has the potential to successfully compete with aviation for relatively long distances, providing a sufficient operating speed can be achieved. For the routes considered here, train speeds of 140 km an hour appear to be sufficient for rail to outperform air (Figure 4-6).

Figure 4-5: Difference in travel time by rail as opposed to air according to distance between city-pairs (hours), 2019



Note: Negative values on the vertical axis indicate that the total travel time by rail is less than that by air.
Source: DG REGIO, DG JRC based on SABRE airline data

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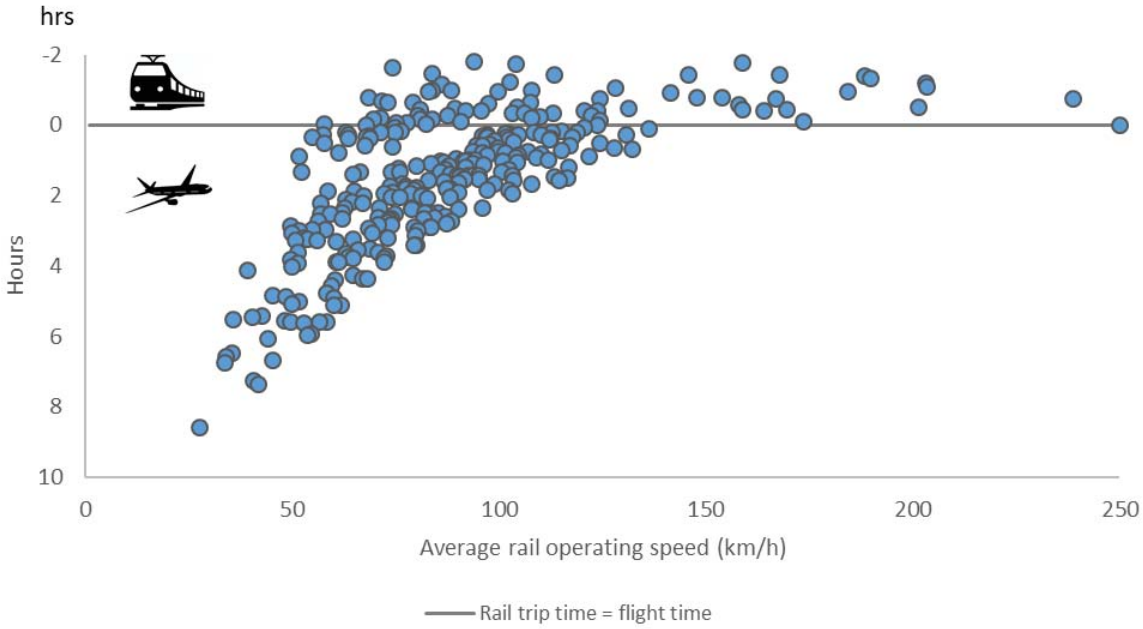
Figure 4-6: Difference in travel time by rail as opposed to air according to train operating speed (hours), 2019



Note: Negative values on the vertical axis indicate that the total travel time by rail is less than that by air.
Source: DG REGIO, DG JRC based on SABRE airline data

4.2 ROAD AND RAIL PERFORMANCE FOR DAY TRIPS AND BEYOND DIFFERS BETWEEN MEMBER STATES AND DEGREE OF URBANISATION

Outside cities, public transport tends to be less developed in terms of network density and service frequency. Distances are often too great to use a bicycle or to walk. As a result, car dependency tends to be higher. For travel to places up to 120 km away, trains are the main alternative to cars, providing there is a railway station nearby. For longer distances of up to 500 km between larger urban centres, trains can outperform cars (as well as planes as seen above).

Box 4.1: Deriving policy-relevant indicators: accessibility in terms of proximity and transport performance

Improving accessibility, i.e. the ease of reaching destinations or activities distributed in space, is one of the main goals of transport policies. Accessibility indicators combine the effectiveness of transport systems with the spatial distribution of places. However, the accessibility of a city can be high because of a good transport system or because the city is large and dense with many potential destinations, and people, concentrated in a small area. In order to distinguish between the two, the International Transport Forum together with the European Commission and the OECD has developed a methodological framework based on three components (summarised in Table 4-1):

Absolute accessibility is the total number of destinations, or the population that can be reached (by driving, cycling, walking or taking public transport) within a given time from a particular place. As indicated above, it encompasses both the size and density of a city or a particular area and the

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transport network that connects the place in question to other places both within the city and outside.

Proximity refers to the spatial concentration around the origin of a trip and the potential destinations or number of people that can be reached. It measures the number of destinations, or population, within a given distance to the origin regardless of the time required to travel to them. Proximity in the present context is determined by geographical characteristics and land use policy that affect the distance between the origin and potential destinations for travellers.

Transport performance for any mode takes explicit account of the spatial distribution of destinations. It relates the total number of destinations, or population, accessible (by car, public transport or bike) to the number of destinations, or population, nearby (i.e. within a given radius). It is calculated as the ratio between absolute accessibility using a given mode and proximity to potential destinations or the population that can be reached. A ratio of one or more means that the performance of a particular mode is high; a ratio close to zero that it is low in providing access to nearby destinations. Although the ratio is somewhat abstract, it avoids the bias resulting from the number of destinations or size of population surrounding the location concerned. It incorporates several aspects of the effectiveness of the mode being assessed in providing access to destinations, such as, in the case of public transport, the frequency of service, the vehicle speed, the number of stops and changes and the distance to the nearest stop or station. Note that this concept of transport performance is narrowly defined within an accessibility context and as such does not reflect other quality aspects of a transport system such as ticket prices, environmental costs, traffic safety or access to parking.

Table 4-1: Accessibility indicators

Accessibility indicator	**Description**
Absolute Accessibility	Number of destinations, or the population, reachable within a fixed amount of time with a given mode, i.e. accessible destinations or population.
Proximity	Total number of destinations, or the population, within a certain distance, i.e. nearby destinations or population.
Transport performance	Ratio of accessible destinations, or population, to nearby destinations or population.

A feature of this set of indicators is that accessibility is the product of proximity and transport performance. These two together, therefore, indicate the effect of land use patterns and transport networks on accessibility.

4.2.1 Passenger rail performance is poor, particularly in rural areas, but improves if the rail trip is combined with a bike ride

As a sustainable means of transport, rail is pivotal in the design and construction of the TEN-T, as it is in the EU's climate policy.

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The extent to which travellers are willing to consider using trains depends in large measure on the time journeys take as compared with using a car. It also depends on the ease of reaching the departure station and of reaching the final destination from the arrival station.[14] A realistic comparison between train and car use needs to take a door-to-door perspective, where the time taken also depends on the means of travel (walking, cycling, public transport, car) used in combination with the train. It needs, in addition, to take account of the frequency of the train service, which means that the travel time may differ between travellers constrained in their choice of departure and/or arrival times, such as commuters, and those able to be flexible about these times (see Box 4-2).

Rail performance (defined here as the population that can be reached within 90 minutes divided by the population living within a 120 km radius – see Box 4-1) varies substantially between Member States (Figure 4-7). Spain has the highest performance, followed by Austria and Germany. The eastern EU countries, particularly Lithuania and Romania, have the lowest performance[15].

The high performance of rail transport does not always translate into good accessibility. For example, the high performance in Denmark translates into only medium-level accessibility, suggesting that the low level of proximity (i.e. the dispersed nature of population) offsets the quality of the rail network and services. Similarly, in Sweden, where rail performance is similar to that in the Netherlands and Belgium, accessibility is relatively low, because of low proximity, reflecting its low population density. Conversely, accessibility by rail is highest in the Netherlands and Belgium, though rail performance is only average.

In all Member States, rail performance is much lower than performance by car. The number of people in the EU that can be reached by car within 90 minutes is 9 times more than by rail. This, however, assumes that people walk to and from the station. Using other means can increase rail performance significantly (see below).

[14] The focus of the transport analyses in this chapter is on accessibility and travel times and does not take into account other determining factors of travel choice behaviour, which include first of all direct transport costs such as ticket prices, but also aspects relating to safety and comfort.

[15] These comparisons assume that the rail trip is combined with short walks to and from the stations, and that the traveller can optimise the timing of the journey.

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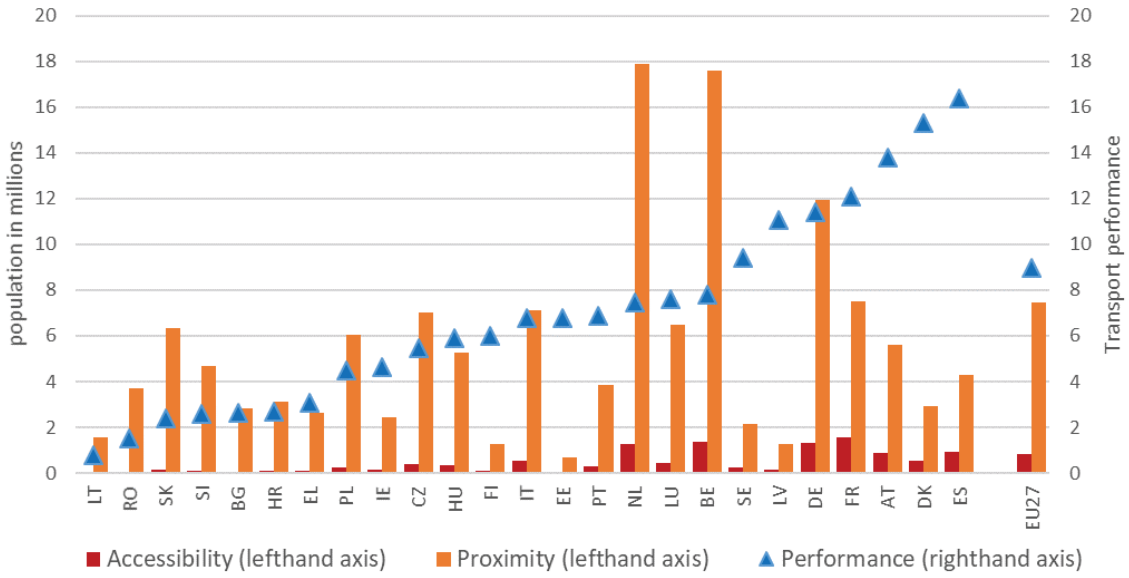
Figure 4-7: Accessibility, proximity and transport performance by rail plus a short walk, 2019



Note: Accessibility is defined as the population that can be reached within 90 minutes of travel time; proximity as the population living within a 120 km radius and rail performance as the ratio of the former to the latter. The figures assume travelling at an optimal time. A short walk is defined as a walk of not more than 15 minutes. Cyprus and Malta, which do not have railways, are not included.
Source: REGIO-GIS

Rail performance varies even more between regions (at the NUTS3 level) (Map 4-3, panel a). Again assuming the rail journey is combined with walking to and from the station, around 12% of people in the EU, mainly living in urban areas, have access to a relatively decent rail service (performance above 20). The top performing regions include Paris and surrounding regions, Berlin, Barcelona, København and its surrounding region, and Wien, but also Zaragoza and Valladolid in Spain, because of the presence of high-speed train services. However, in all NUTS3 regions, rail performance is lower than road (see below), which hardly encourages people to travel by train especially if they need to travel frequently.

Rail performance improves significantly if travel by train is combined with a short bike ride instead of a short walk (Map 4-3, panel b). This increases average performance in the EU from 9 to 21 and the proportion of population with access to a performance above 20 to 40%. In a number of metro regions in France and Germany, including Berlin and Paris, rail performance is increased to around 80 or above. However, rail performance remains lower than that of road in all regions.

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Box 4.2: Flexible versus time-constrained rail journeys

The estimates of performance in this subsection are based on the assumption that travellers do not have any time-constraints, can plan their journey using the fastest train service available and do not have to wait at stations. Journeys with constraints on departure times may be more relevant for day-to-day travel, such as for commuting. This restricts the choice of service and may involve waiting time if connections are involved, depending on the frequency of services. Indeed, the attractiveness of trains for commuting is dependent on good service frequencies. Performance for time-constrained journeys is obviously lower. Urban areas with the highest performance in this case are now in Austria and France, as well as Denmark, suggesting very frequent services in and around their cities. Performance in urban areas in the Netherlands is almost the same as in Belgium, though performance using the fastest available connection is much higher in Belgium (as shown in Figure 4-9a). This indicates that services in Belgium are less frequent than in the Netherlands.

As expected, whether walking or cycling to the station, rail performance tends to be highest in cities, followed by towns (Figure 4-8, panel a). It is lowest in rural areas (see Box 4-3 for definitions), reflecting the fact that train stations tend to be located in or close to urban centres and that the population is more dispersed in rural areas.

For rail journeys combined with a short walk, urban areas in Denmark, France, Austria and Spain have the highest performance, especially in Denmark with its dense suburban rail network in Copenhagen and surrounding areas. In most countries, smaller towns are less well connected than larger cities, though in Luxembourg, Sweden and Poland, the performance is similar.

Using a bike instead of walking to the station increases rail performance to over 50 in cities in Denmark and France. In all Member States, cities benefit the most from the rail-bicycle combination in terms of their transport performance score (Figure 4-8, panel b). However, rail performance also improves in towns and suburbs by using a bike, especially in Sweden, Germany and Denmark, as well as in rural areas, if less so. This argues in favour of further developing cycle-friendly infrastructure around railway stations.

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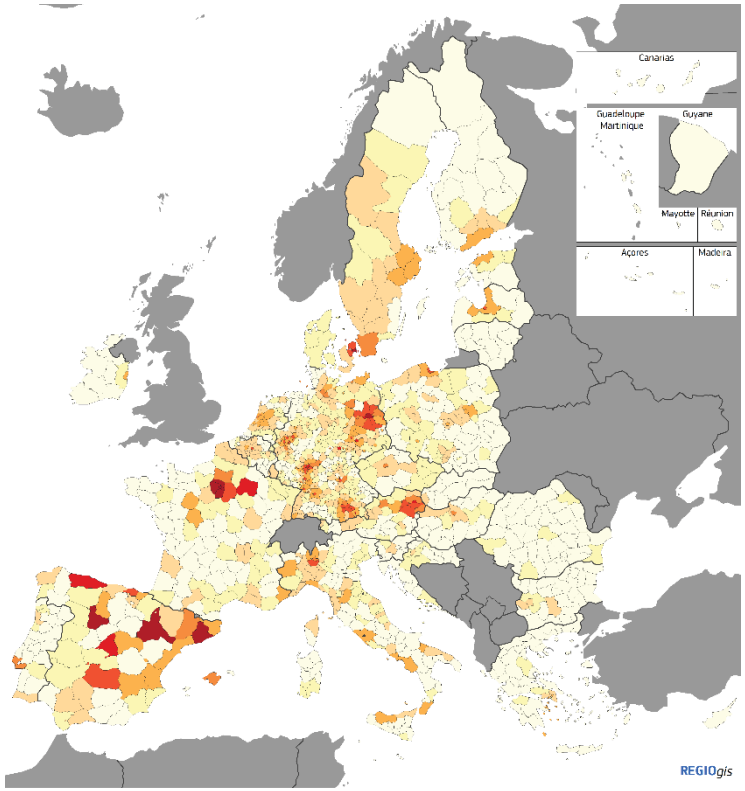
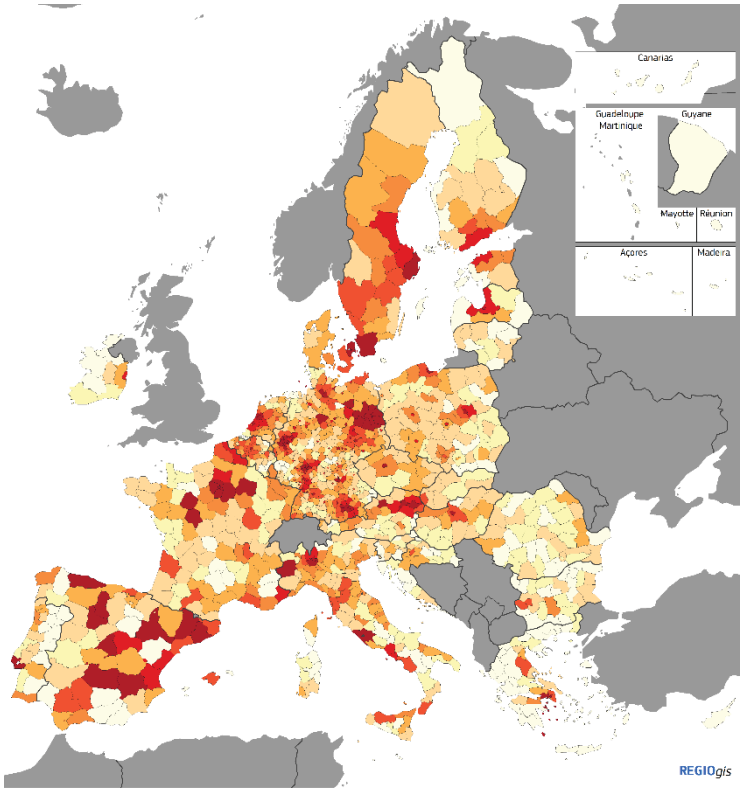
Map 4-3: Rail performance by NUTS 3 region, 2019

(a) Rail combined with a short walk



(b) rail combined with a bike ride



Box 4.3: Degree of urbanisation level 2

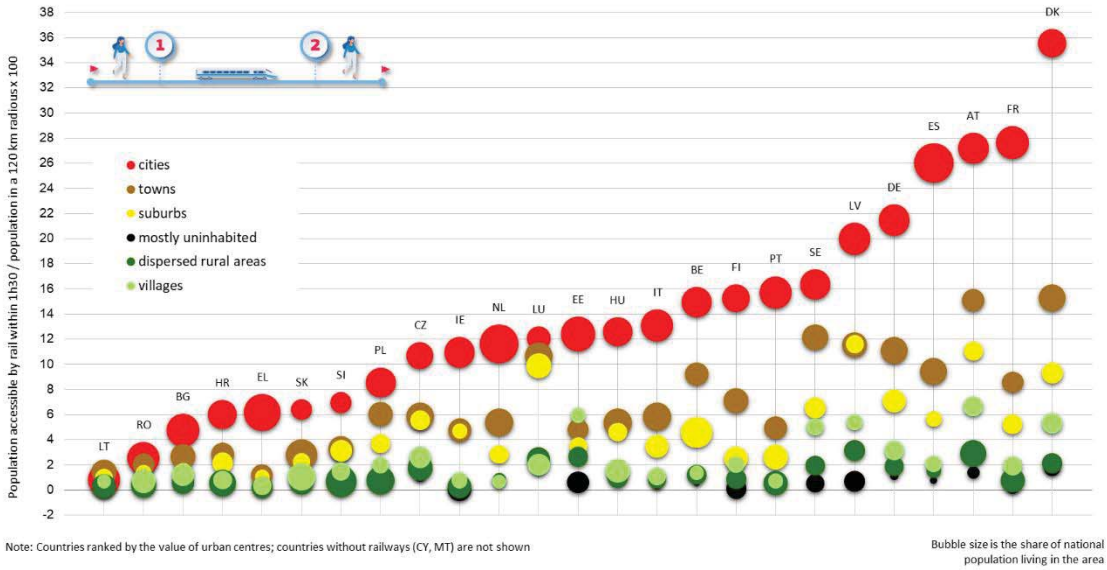
This typology classifies local administrative units (LAUs) into six categories, based on population size and density.

1. *Cities*: LAUs that contain an urban centre with population over 50 000
2. *Towns*: LAUs with the majority of the population living in a dense or semi-dense urban cluster
3. *Suburbs*: LAUs with the majority of their population living in an urban cluster that is not dense or semi-dense.
4. *Villages*: LAUs with the majority of their population living in a rural cluster
5. *Dispersed rural areas*: LAUs with the majority of their population living in low density rural areas
6. *Mostly uninhabited*: LAUs with the majority of their population living in very low density rural areas

For a comprehensive description, see https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/ks-02-20-499

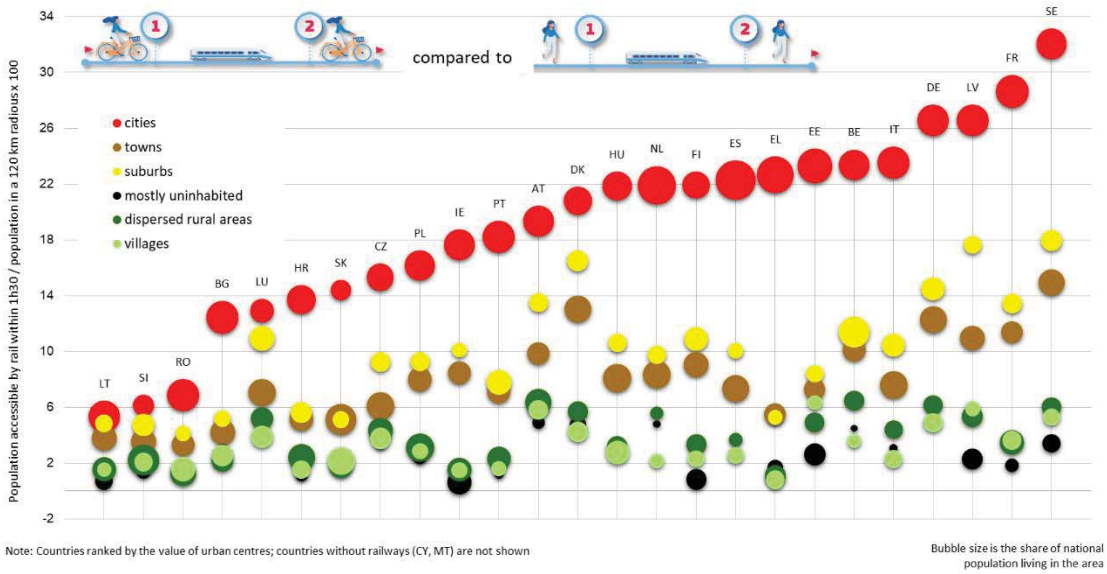
Figure 4-8: Rail performance by degree of urbanisation level 2, 2019

(a) Rail trip combined with a short walk



Source: REGIO-GIS

(b) Increase in rail performance if combined with a short bike ride instead of a short walk

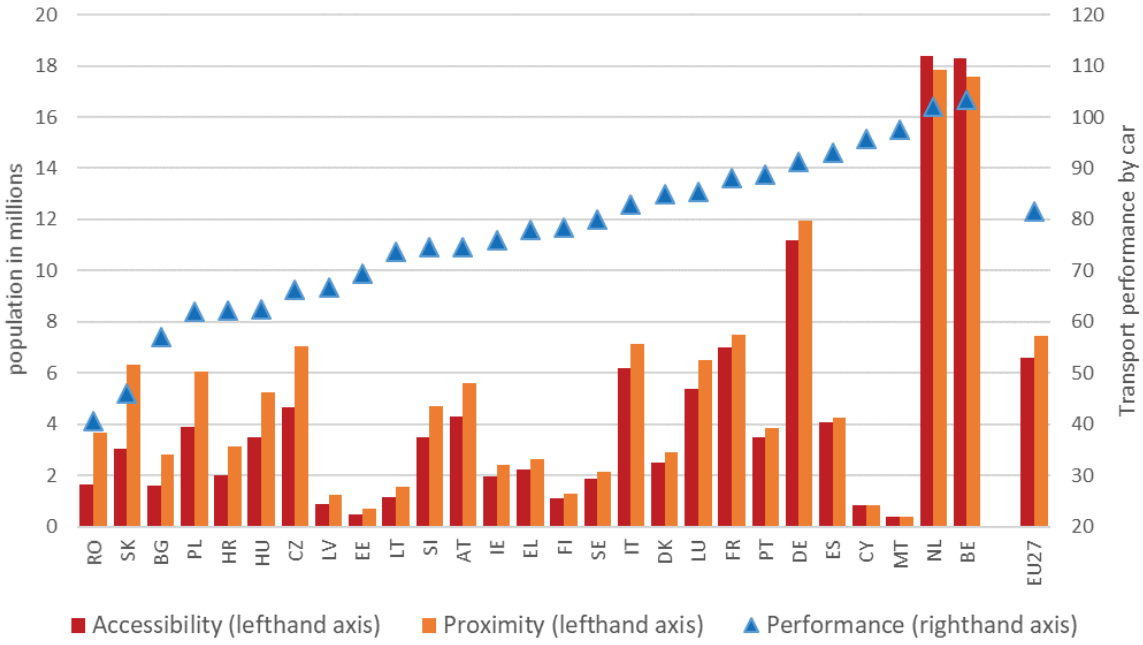


Note: A short bike ride is defined as a bike ride of not more than 15 minutes.
Source: REGIO-GIS

4.2.2 *Road performance is higher than rail, but remains low in some Member States and rural areas*

Road performance[16] by car in 2018 varies substantially between Member States, being highest in Belgium and the Netherlands (Figure 4-9). Both countries are relatively small and highly urbanised, with a dense road network. Malta and Cyprus are third and fourth, reflecting the fact that both islands are relatively small and most destinations can be reached within 90 minutes. Portugal and Spain, two countries in which there has been several decades of substantial Cohesion Policy investment in transport infrastructure, now have road performance above the EU average and similar to that of Germany and France. Road performance is lowest in Slovakia and Bulgaria because their road networks are not yet fully developed, but also because of mountainous areas where the road network is constrained by geography.[17]

Figure 4-9: Accessibility, proximity and transport performance by car, 2018



Note: Accessibility is defined as the population that can be reached within 90 minutes of travel time by car; proximity as the population living within a 120 km radius; car performance is calculated as the ratio of the former to the latter (See also Box 2).

Source: REGIO-GIS

There is a close link between accessibility and proximity across Member States. Accessibility alone, however, is not a suitable indicator of road performance because it is to a large degree determined by proximity, i.e. how many people live nearby. For example, in Finland or Sweden, accessibility is less than half that in Poland, but this does not mean that Sweden and Finland need more investment in

[16] For a description of the transport performance indicator see Box 2. In this section, road performance is defined as the population that can be reached within 90 minutes of driving time by car, divided by the population living within a 120 km radius.

[17] In addition there may be economic constraints as roads in mountainous areas are more costly to build and maintain.

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roads to catch up. Road performance shows that in Finland and Sweden, around 80% of the population within a 120-km radius can be reached in 90 minutes, as against only 62% in Poland.

Road performance by car also varies substantially between regions within countries, both in less-developed Member States (especially in Bulgaria, Greece and Poland) and more-developed ones (particularly in France and Finland) (Map 4-4). Road performance tends to be relatively low in regions in eastern Europe and high in densely populated regions in the Netherlands and Belgium, as well as in many Spanish regions. In several of the latter, though not densely populated on average, the population is concentrated in densely populated cities, towns and villages, with decent road networks providing access to a large population within 90 minutes of driving. Most of the capital metro regions have high road transport performance, which stands out particularly in Bulgaria, Croatia, Romania and Slovakia, where overall road performance is low.

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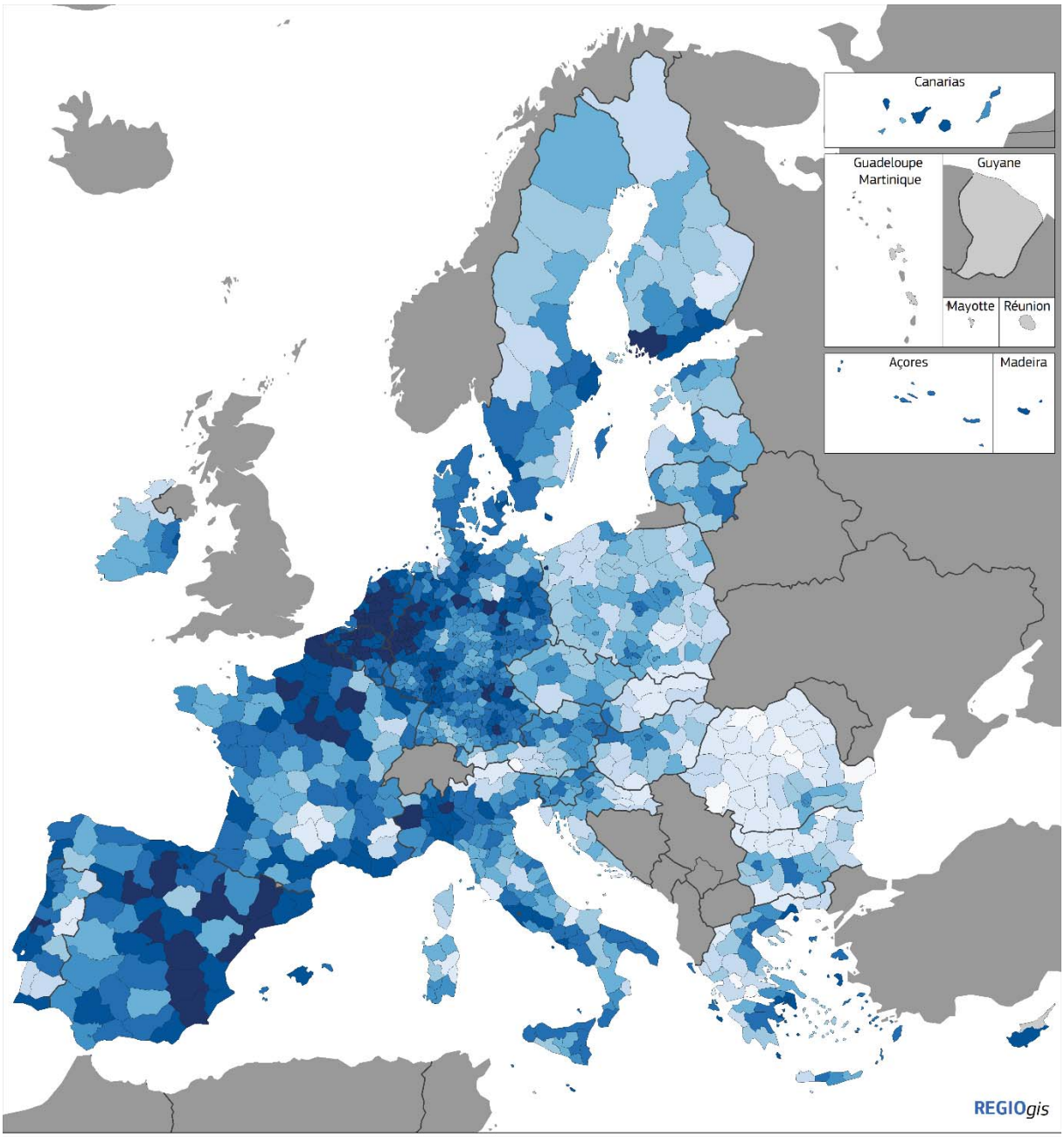
Map 4-4: Road performance by car in NUTS-3 regions, 2018



Transport performance by car per NUTS3 region, 2018

Population within a 1h30 travel / population within a 120 km radius x 100

0 - 20	70 - 80
20 - 40	80 - 90
40 - 50	90 - 100
50 - 60	> 100
60 - 70	no data

EU-27 = 81.4
Sources: REGIO-GIS, Eurostat, JRC, TomTom

0 500 Km

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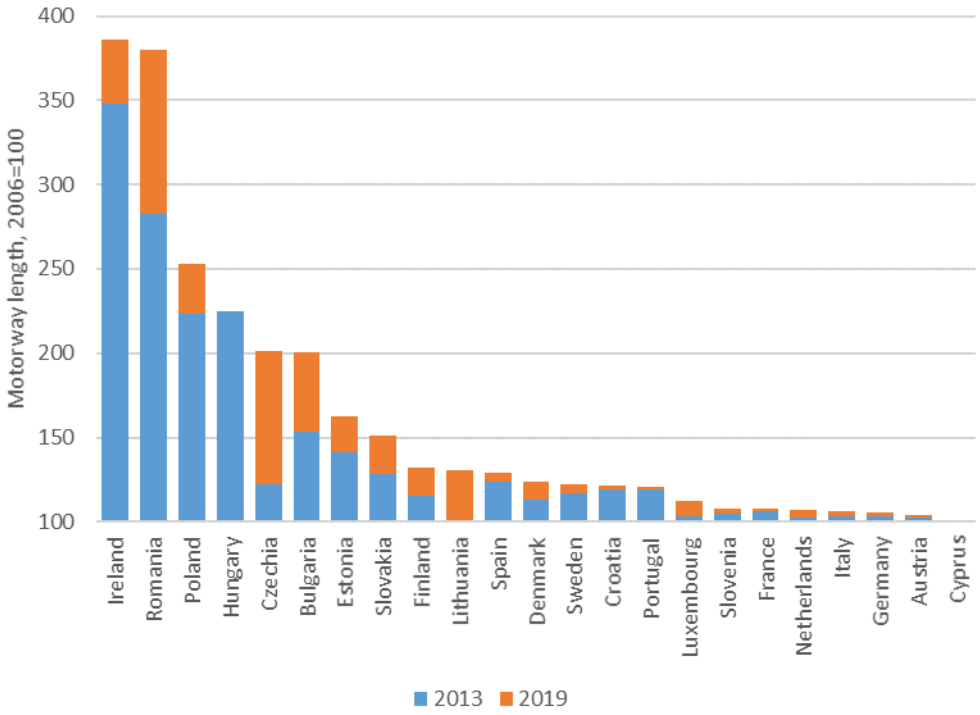
Box 4.4: The increase in motorways over recent years varies strongly between Member States

Investment in new motorways can help to increase road transport accessibility and performance. Road transport accessibility and performance are statistically related to the density of motorways and their share in the road network at large.

In the period 2006-2019 the length of motorways increased in all Member States, except Cyprus, where it remained unchanged (Figure 4-10). However, there is large variation across Member States, with motorway length in Ireland and Romania increasing by almost 4 times over this period, while in Austria, Germany, Italy, Netherlands, France and Slovenia, the increase was below 10%. The increase was on average larger in eastern Member States, where there were comparatively few motorways at the beginning of the period.

Figure 4.-10: Motorway length, 2006-2019



Note: Belgium, Latvia, Greece, Malta no data. Denmark, Spain and Italy 2018
Source: Eurostat [road_if_motorwa]

As in the case of rail, road performance differs according to the degree of urbanisation. Cities have the highest performance in all Member States. The performance for cities does not only reflect intra-urban trips but strongly depends on the travel time between the city and surrounding areas of up to 120 km away, which may well include rural areas. Despite their generally high performance, there are large differences between cities in different countries (Figure 4-11). Whereas in the Netherlands,

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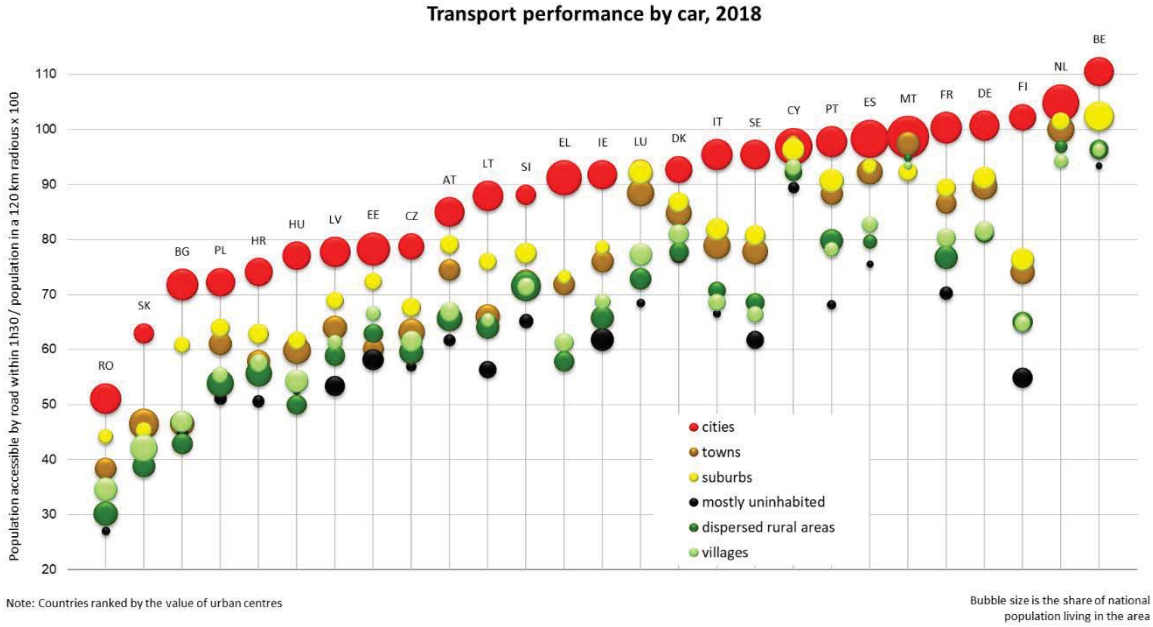
Belgium, Finland, Germany and France, the road performance indicator exceeds 100, it is below 75 in Romania, Slovakia, Bulgaria, Poland and Croatia. In addition, in the latter countries there are large differences in performance between the three types of urban area because of the low performance in towns and suburbs. There are also large differences in this respect in many other countries. In some, this reflects low average population density and the long distances between places, especially in Finland and Sweden.

Figure 4-11: Road performance by degree of urbanisation level 2, 2018



Source: REGIO-GIS

The three types of rural area have the lowest road performance in all countries, but this does not necessarily indicate a lack of roads. In fact, the road network per head is four times longer in villages than in cities, 10 times longer in dispersed rural areas and 20 times longer in mostly uninhabited areas. A more dispersed population means that more roads are needed to provide a given degree of access. Road performance is therefore particularly low in dispersed rural areas and the mostly uninhabited ones. Rural areas have a road performance similar to that in urban areas only in the densely populated Member States of Belgium and the Netherlands and in Malta and Cyprus. In these countries, the areas concerned tend to be sparsely populated areas close to (or even surrounded) by more densely populated and well-connected ones, rather than being remote from these. In most Member States however, performance in rural areas is considerably lower than in urban areas. Even so, there is large variation across countries, with rural areas in north-western and southern Member States, including in Germany, France, Spain and Italy, showing a higher performance than eastern Member States such as Romania, Slovakia and Bulgaria.

Box 4.5: Transport performance is lower in border areas

One out of seven EU residents live within 25 km of a national land border. Although EU transport policy places considerable emphasis on cross-border infrastructure investment and connectivity, road transport performance is lower in border areas than in other areas (Figure 4-12a). This difference is more pronounced in rural areas. In cities, towns and suburbs, road performance is

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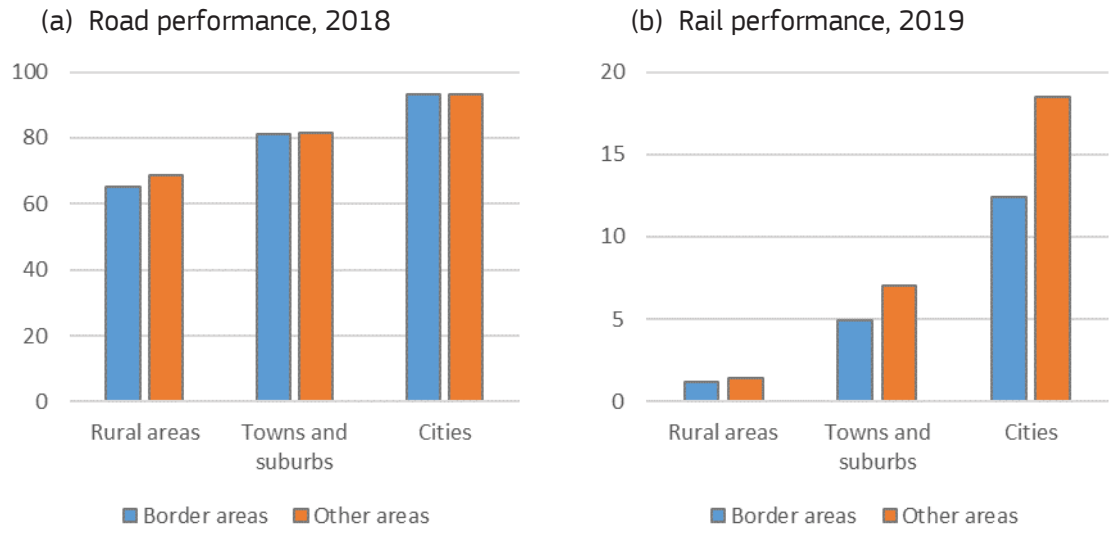
more similar between border and other areas. In addition to the complexity of coordinating cross-border infrastructure, the low performance in border areas is also affected by natural obstacles along these borders, such as mountains and large rivers. Indeed, some of the lowest performances are found in border areas in mountainous areas (Poland-Slovakia, Austria-Italy, Bulgaria-Greece) or along a river border (Bulgaria-Romania). Conversely, the best performances are found in the flat and comparatively densely populated areas along the borders between the Benelux countries, France and Germany.

Figure 4-12: Transport performance in border and non-border areas by degree of urbanisation



Source: REGIO-GIS

Compared to road, cross-border rail transport is hindered by a variety of additional obstacles relating to technical interoperability, timetable coordination and administrative issues, among other factors. Consequently, and despite the emphasis EU transport policy has placed on overcoming these issues, the European railway area still features numerous gaps on the continent's land borders where the national railway networks are not properly connected. Indeed, the difference in rail transport performance between border and non-border areas is larger than for road transport (Figure 4-12b), which is even more notable when seen in relation to the lower average performance of rail. The lower performance of rail in cross-border areas is more pronounced for cities and for towns and suburbs. This may be linked to the fact that rail networks are in most cases primarily designed to connect cities and towns, and suburbs, and that it is therefore in these areas that the impact of missing cross-border connections is strongest.

4.2.3 The roll-out of electric vehicle charging points is still uneven

The transition to alternative fuel vehicles, needed to reduce dependence on oil and to mitigate the environmental impact of road transport, depends on the building-up of an infrastructure network for such vehicles, electricity charging points, in particular.

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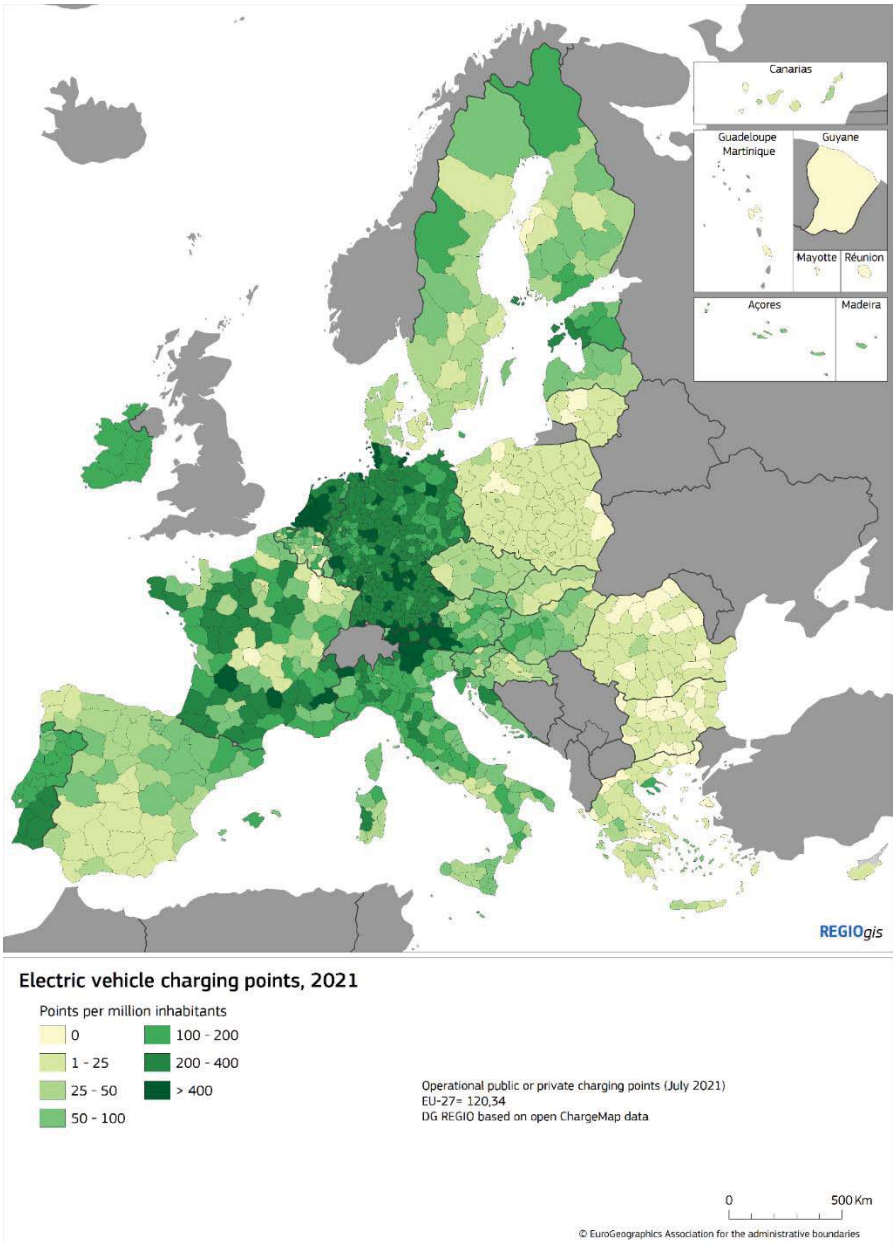
In 2021, the number of charging points in the EU is just 120 per million inhabitants. The largest numbers relative to population are in some of the alpine regions in Austria and Italy, in various parts of Germany and the Netherlands, and in a few regions in France (Map 4-5). The charging infrastructure, on the other hand, is relatively underdeveloped in regions in Lithuania, Poland, Romania, Bulgaria, Greece, Cyprus and Denmark. The variation between regions across the EU largely reflects differences between Member States rather than within them, suggesting the importance of differences in national policies with respect to charging infrastructure. Nevertheless, there is considerable regional variation in some countries, including France and Spain.

Map 4-5: Electric vehicle charging points in EU regions, 2021



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Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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CHAPTER 4 A MORE CONNECTED EUROPE – PART 2

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Chapter 4 A MORE CONNECTED EUROPE – PART 2

4.3.CONNECTING TO NEARBY DESTINATIONS: TRANSPORT PERFORMANCE IN CITIES AND METROPOLITAN AREAS

4.3.1.The majority of the people living in cities have good access to public transport

The 11th UN Sustainable Development Goal (SDG) is to make cities and human settlements inclusive, safe, resilient and sustainable. Public transport is important to achieving this goal. Indeed, one of the targets of the goal is to provide access to safe, affordable, accessible and sustainable transport systems for all, improve road safety, notably by expanding public transport, paying special attention to the needs of women, children, people with disabilities and older people, especially those in vulnerable situations. The core indicator used to measure progress towards this target is the share of the population with easy access to a public transport stop or station, whether bus, tram, metro or train, and the frequency of services when they get there. The assumption is that people are willing to walk up to 500 metres to reach a bus or tram stop and/or up to a kilometre to reach a train or metro stop.

Access to a public transport stop within such a distance is not a problem in the vast majority of urban centres in the EU (Map 4-6). In more than half of the cities covered, this applies to over 95% of the population. In only 12 of the 384 cities is the share below 80%, many of them being smaller Dutch cities, where a large proportion of journeys in the city are made by bicycle. Country averages range from 88% in Romania to 99% in Luxembourg, with the proportion across the EU averaging 94% in cities of fewer than 100 000 people and 98% in those of over 2 million. Access to public transport stops in other human settlements, i.e. outside of cities, can be expected to be much lower than in cities, although data to analyse this is not readily available.

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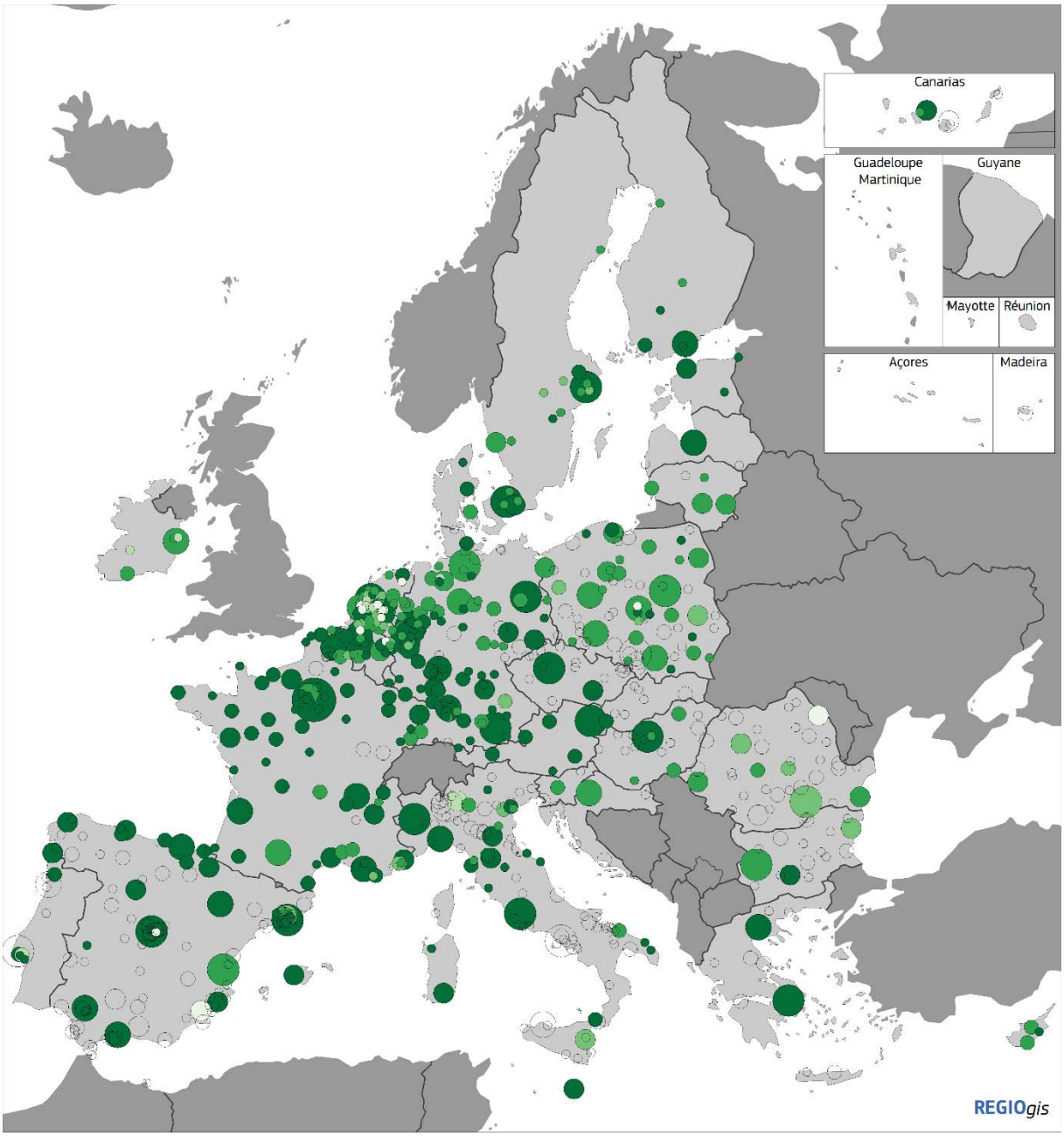
Map 4-6: Population with a public transport stop within walking distance, 2018-2019



Population with a public transport stop within walking distance, 2018-2019

% of population
- < 80
- 80 - 85
- 85 - 90
- 90 - 95
- >= 95
- No data

Urban centre population
- < 100 000
- 100 000 - 250 000
- 250 000 - 500 000
- 500 000 - 1 000 000
- 1 000 000 - 5 000 000
- >= 5 000 000

UN SDG indicator 11.2.1: bus or tram stop within 500 m and/or train or metro stop within 1 km
Sources: public transport operators, UIC, Eurostat, NSIs, Copernicus Urban Atlas 2018, OpenStreetMap, TomTom, REGIO-GIS

0 500 Km

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4.3.2.Within cities, nearby locations can more easily be reached by bicycle than public transport

In addition to access to conveniently located public transport stops, the frequency of service and the destinations or population that can be reached are also key aspects of sustainable mobility in cities. This subsection assesses public transport performance in EU cities, defined as the share of population inside the city within a radius of 7.5 km that can be reached within 30 minutes of 'door-to-door' travel time[1].

Across the 39 EU cities[2] analysed, public transport performance for trips that can be made within 30 minutes averages a modest 29 (Figure 4-13), which means that a city resident can reach 29% of the population living within 7.5 km by public transport within 30 minutes. The proportion, however, varies from 13% in Dublin to 48% in Luxembourg.

Facilitating sustainable urban mobility goes beyond the provision of an efficient public transport service. Walking and cycling, as well as other forms of micromobility, are well suited to making short-distance trips within cities and encouraging these can help to reduce traffic congestion[3].

In each of the 39 cities covered, bicycle performance for short trips is much higher than that of public transport, in that many more people within a radius of 7.5 km can be reached within 30 minutes. The absence of waiting times, inherent in the use of public transport, is a key part of the difference. However, it should be noted that not all streets in cities are suitable for cycling and the analysis excludes roads where cycling is not allowed (mostly urban motorways) and is adjusted for speeds on streets going uphill. The ease of use of bicycles also depends on the support measures provided, in the form of bike lanes, traffic restrictions and speed limits.[4] As these are not taken into account here, the indicator can be seen as a measure of potential bicycle performance. Actual performance depends on the extent to which these are provided and the general support given to bike riding.

Despite the difference in performance between public transport and bicycles, there is some consistency in the city rankings of the two. As for public transport, Cluj-Napoca (Romania) and Luxembourg top the ranking for bike performance (with values close to 100), while Tallinn, Ljubljana and Gent also have relatively high performance for both bikes and public transport.

[1] Door-to-door travel time includes in-vehicle time according to the scheduled timetables, waiting time, transfer times, and the walking time from the point of departure to the public transport stop and from the stop closest to the destination to the destination itself. This time is calculated for 9 different departure times during a two-hour morning peak period and then averaged. By focusing on travel time, the analysis does not take into account travel costs or the degree of integration of ticketing between the city and other zones within the functional urban area.

[2] The selection of urban centres was based on availability of comprehensive timetable information and the time required to process this.

[3] FLOW project (2016).

[4] The attitude of motorists to cyclists and the behaviour towards them is also an important factor in this respect.

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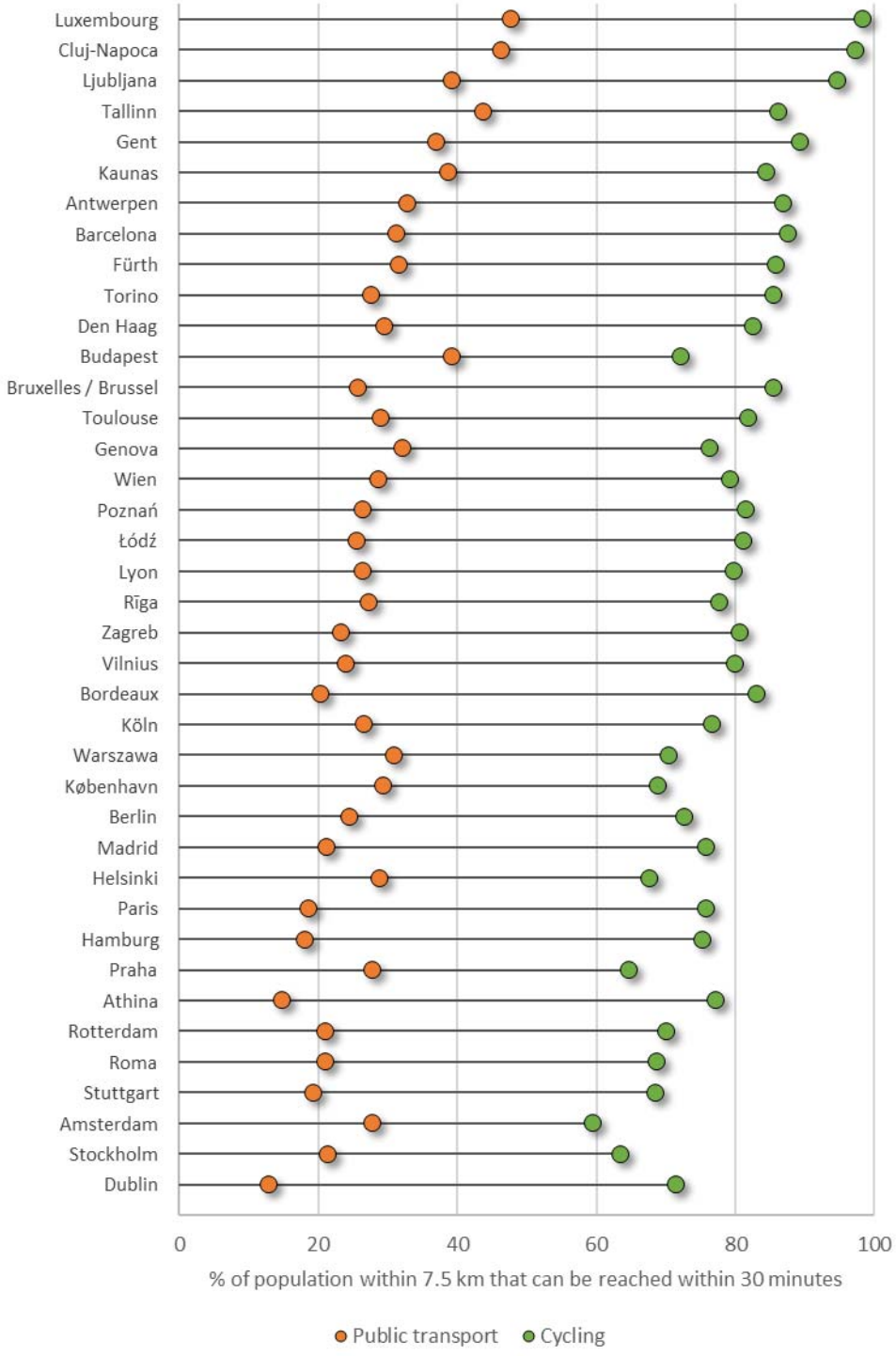
Figure 4-13: Performance of bicycle and public transport for trips up to 30 minutes, 2018*



Note: *The precise reference year varies between Member States but most of the data relate to 2018
Cities are ranked by the average performance of public transport and cycling
Source: DG REGIO

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4.3.3 The performance of cars in metropolitan areas is strongly affected by congestion.

Although stimulating the take-up of more sustainable transport modes, along with creating synergies between them and easing multimodality, is one of the cornerstones of urban transport policy in the EU, the car remains the main form of travel in most cities, being responsible, on average, for two-thirds of commuter journeys.[5]

Road performance by car[6] in free flowing conditions (i.e. no congestion) in 257 selected EU metro areas[7] averages 430, and ranges from 800 in Madrid to 100 in Timisoara (Romania). The highest figures are in cities in Spain, France, Denmark and Germany, the lowest in cities in Romania, Malta and Cyprus (Map 4-7).

In general, road performance by car tends to be higher the more populous the metropolitan area. Nevertheless, the relationship between total population and performance is not very close and in many smaller cities in Spain, France and Germany, such as Zaragoza, Rennes and Braunchweig, the performance is very high.

Long-term demographic trends show a continuous increase in the share of population living in metro areas. One consequence of this, combined with increasing car ownership and use, is road congestion. Congestion varies greatly over time and between places and has a strong influence on accessibility and car performance, affecting both commuting trips between the city and surrounding areas and trips within the city. Increasing the capacity of roads, however, does not necessarily reduce congestion in the medium-term, as people tend to respond by travelling longer distances and more by car. More and longer car journeys also increase greenhouse gas emissions and air pollution.

[5] Consistent data covering all FUAs, all types of journey and referring to the same year are not available. The most recent data for each FUA shows that, on average, 67% of journeys to work are made by car. The data available are for FUAs in 10 Member States, and country-level aggregated data for two Member States. Together, these 12 Member States cover all three regional areas (north-western EU, eastern EU, and southern EU) and all levels of development.

[6] For the general concept of the transport performance indicator, see Box 4-1. The indicator used here is the population within the metro area that can be reached within 30 minutes of driving time by car, divided by the population in the metro area within a 10 km radius, multiplied by 100.

[7] The analysis here covers metro areas with a population of over 250 000.

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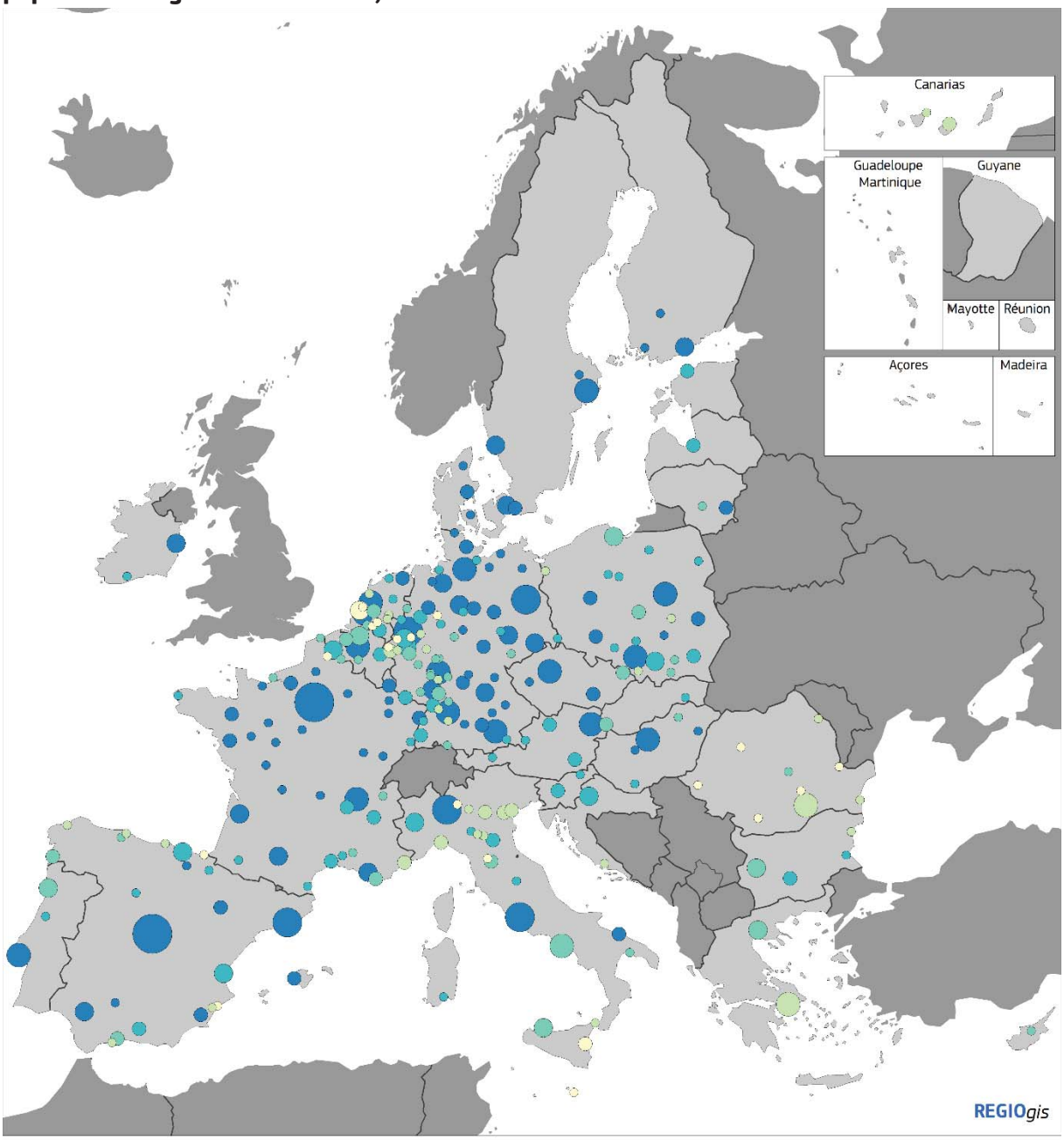
Map 4-7: Car performance in free flowing conditions in metropolitan areas with a population larger than 250 000, 2017



Road performance by car under free flow traffic conditions in major FUAs, 2017

Population reached within 30 minutes / population within a 10 km radius x 100

- < 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- >= 600

FUA population

- < 500 000
- 500 000 - 1 000 000
- 1 000 000 - 2 000 000
- 2 000 000 - 4 000 000
- 4 000 000 - 6 000 000
- >= 6 000 000

Performance relates to the population within the FUA
FUAs with population larger than 250,000
Source: Christodoulou e.a. (2020)

0 500 Km

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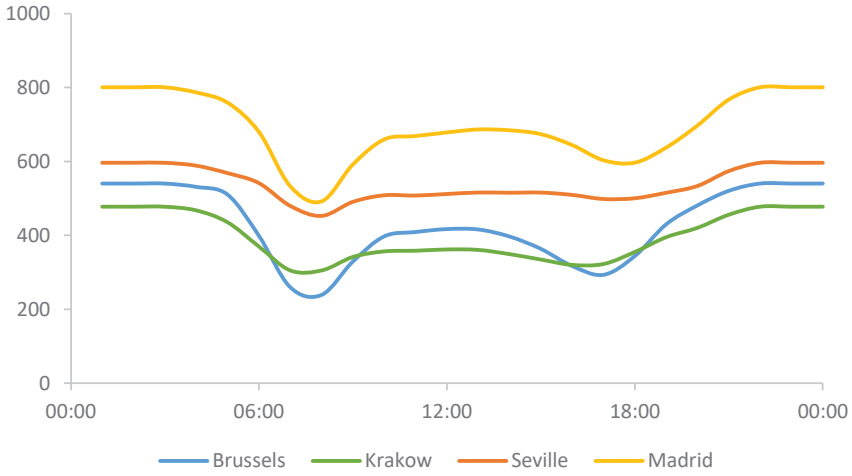
Box 4.6: The impact of congestion over the course of the day

Road performance in a selection of EU metro areas[(i)] follows a distinct pattern over the day, which clearly reflects the impact of the morning and evening peaks on traffic speeds (Figure 4-2). For each of the four metro areas covered, the effect of traffic congestion on road performance is greater during the morning peak between 7:00 and 9:00 than during the evening one. This is possibly because school runs combine with commuting in the morning but not in the evening, there may be more flexibility about the timing of return trips, or there could be fewer bottlenecks when travelling from the city centre to the periphery than vice versa (since the capacity of roads outside cities tends to be greater than inside – i.e. it is easier and quicker for cars to move from a small space into a larger one than vice versa).

Road performance in cities depends largely on the number of daily commuters and modes of transport used by them. Brussels and Madrid experience particularly sharp declines in performance as a result of congestion. During both the morning and evening peaks, performance in Brussels falls below that of Krakow. During the day, between the morning and evening peaks, performance remains lower than after the evening peak and at night, indicating that free flow speeds are never reached during this period.

Figure 4-2: Hourly variations over the course of a day in road performance by car in Brussels, Krakow, Madrid and Seville, 2017



Source: DG JRC (unit C.6)
Road performance is defined here as: population within the FUA reached within 30 minutes population within a 10 km radius x 100.

[(i)] The four metro areas are selected as they vary significantly in terms of geographic position, size, status of infrastructure, and levels of congestion.

Among the 257 metro areas covered here, the impact of congestion on road performance is greatest in some of the largest cities, including Paris, Milan, Toulouse, Munich, Madrid and Brussels (Map 4-8). This reflects the volume of commuter traffic, only Milan applying congestion charges. By contrast, in

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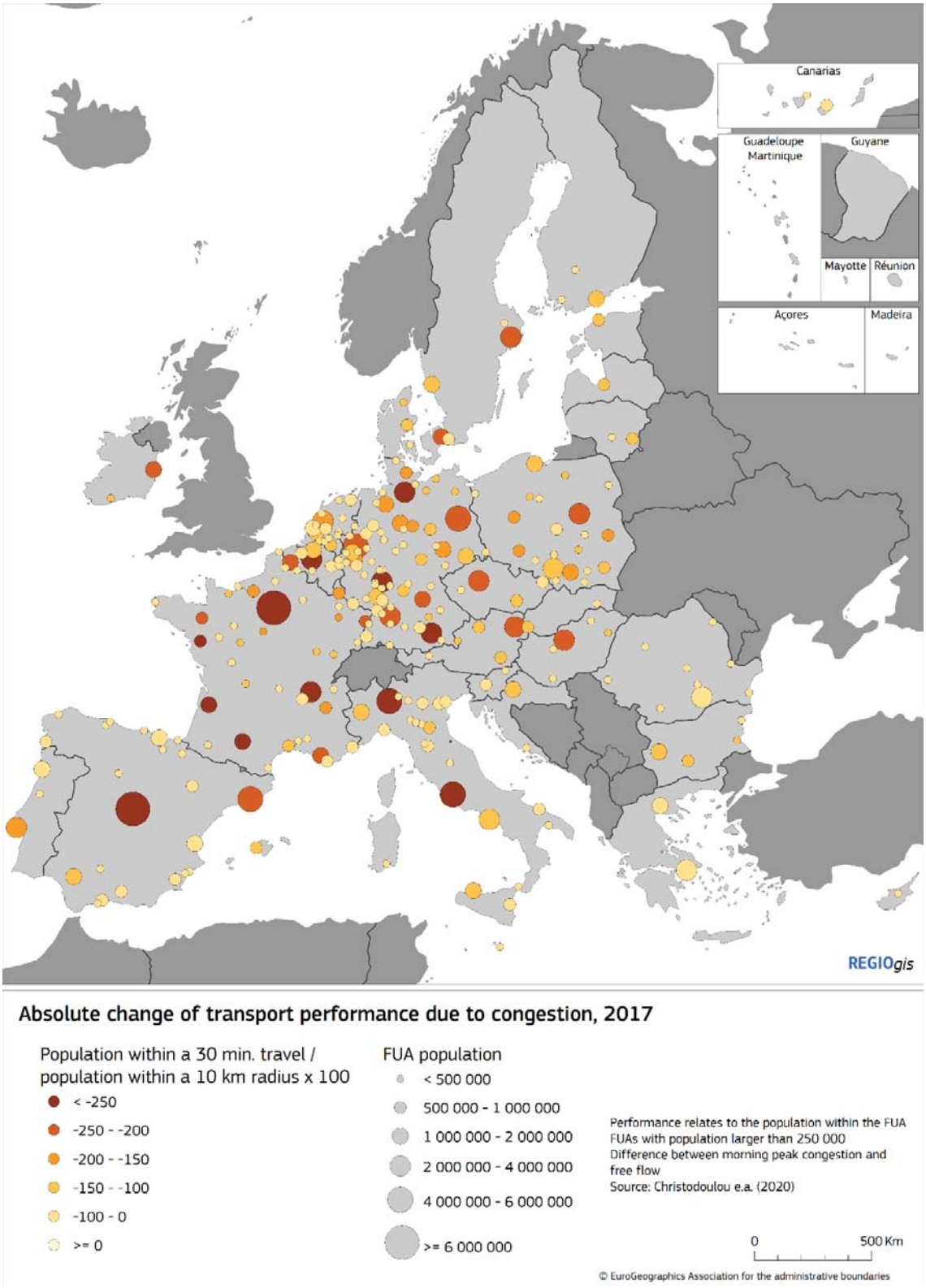
many of the smaller-sized metro areas across the EU, peak hour congestion has almost no noticeable impact on performance.

While in some metropolitan areas the gains will be larger than in others, congestion could be reduced substantially by increasing the share of journeys made by public transport and bicycle. The bicycle in particular offers a fast and green substitute for cars within cities (as seen above).

Map 4-8: Effect of congestion on road performance in metropolitan areas with a population larger than 250 000, 2017



4.4 TRAFFIC FATALITIES ARE STILL TOO HIGH IN MOST EU REGIONS, BUT MANY CITIES HAVE MET THE 2030 REDUCTION TARGET

The transition to sustainable mobility is linked to a reduction in traffic accidents. First, this is because a small number of traffic accidents is one aspect of a sustainable transport system. Second, an increase in road safety might boost walking or the use of bicycles, which in turn would contribute to sustainable mobility. The long-term goal of the EU is to move close to zero road deaths by 2050 ("Vision Zero"). To this end, the aim is to reduce the number of road deaths by 50% between 2020 and 2030[8], or to achieve a reduction to not more than 25 road fatalities per million inhabitants by 2030.[9]

Road traffic fatalities in the EU declined by almost 40% between 2008 and 2018. Nevertheless, the number still averaged 52.7 per million inhabitants in 2018 – over twice the 2030 target –though with large differences between regions (Map 4-9). The road traffic fatality rate is, on average, higher in less developed regions (69.9) than in transition regions (56.7) and more developed ones (40.3). The regions with the highest figures - with over 90 deaths per million - are mostly in eastern and southern Member States, especially in Romania, Portugal, Greece, Bulgaria, Croatia and Poland. However, rates in the Belgian provinces of Luxembourg and Namur are similarly high, with 122 and 107 recorded road fatalities per million inhabitants, respectively. The rate is notably lower in capital city regions. This is true for those in the north-western EU, especially Wien, Berlin, Stockholm, Bruxelles/Brussel, and Helsinki-Uusima, which, together with Madrid, have among the lowest rates of all regions. It is also true for eastern EU capital city regions, like Praha, Budapest, Warszawski stołeczny and Bucureşti–Ilfov, where the rates are not as low, but still much lower than in other regions in their countries.

The lower fatalities in capital city regions may be a manifestation of a more general relationship between road safety and the degree of urbanisation in a region. Data for 771 cities in the EU show that the average fatality rate in cities (33.6 per million inhabitants) is much lower than the overall rate in the EU (52.7) (Map 4-10). This is possibly because traffic speeds are lower in urban areas, as is car use because of the availability of public transport, and average journeys are shorter than in other areas. Average fatality rates are higher in the eastern EU Member States, although many cities in Italy and some cities in Belgium, France and Spain also have high rates. Larger cities tend to have lower rates than smaller ones and capital cities stand out with particularly low rates.

[8] European Commission (2019) EU Road Safety Policy Framework 2021-2030 - Next steps towards "Vision Zero", SWD(2019) 283 final

[9] In agreement with the Member States it was decided to use the baseline of 2019, on the basis that 2020 was an exceptional year with the number of deaths falling by 17% from 2019 to 2020.

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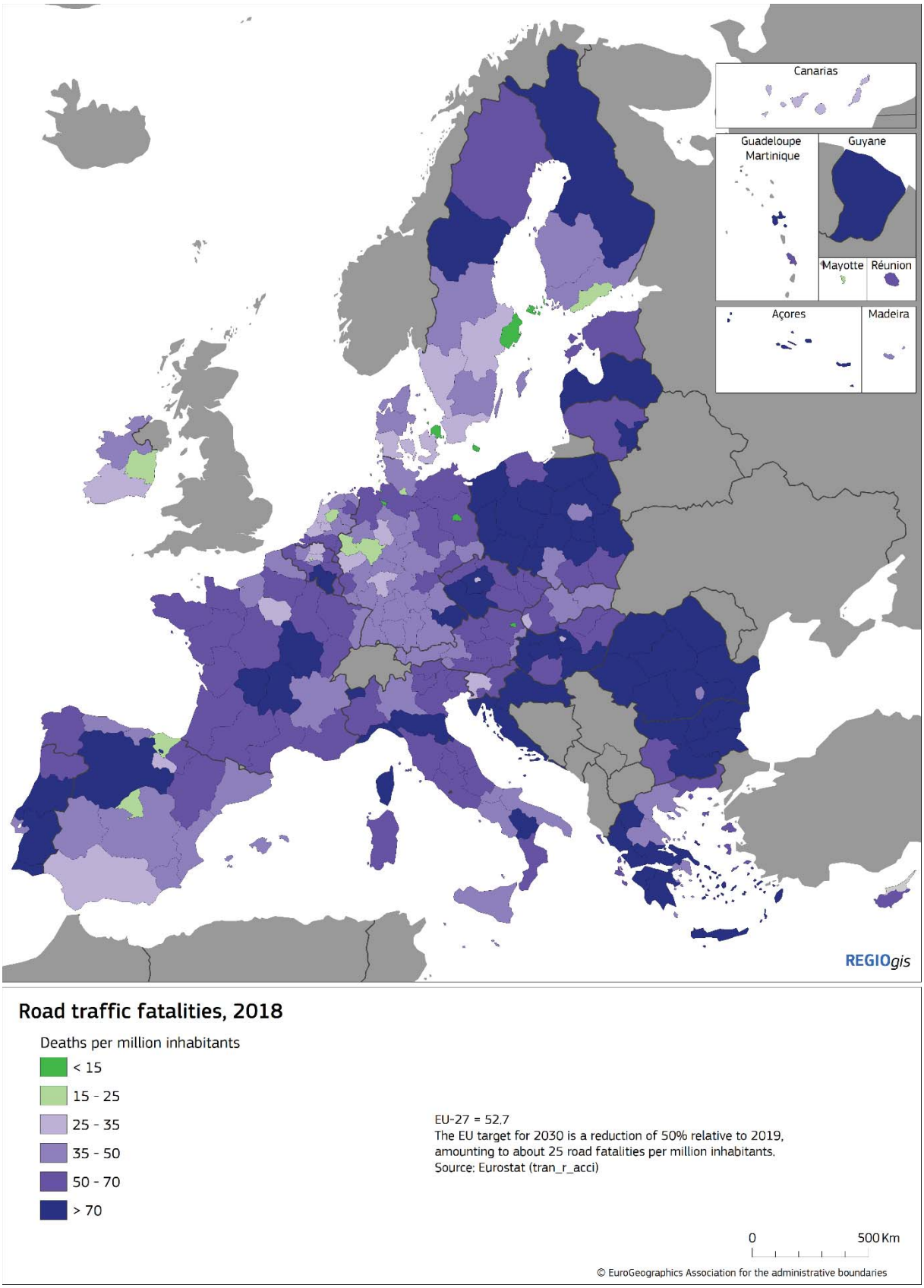
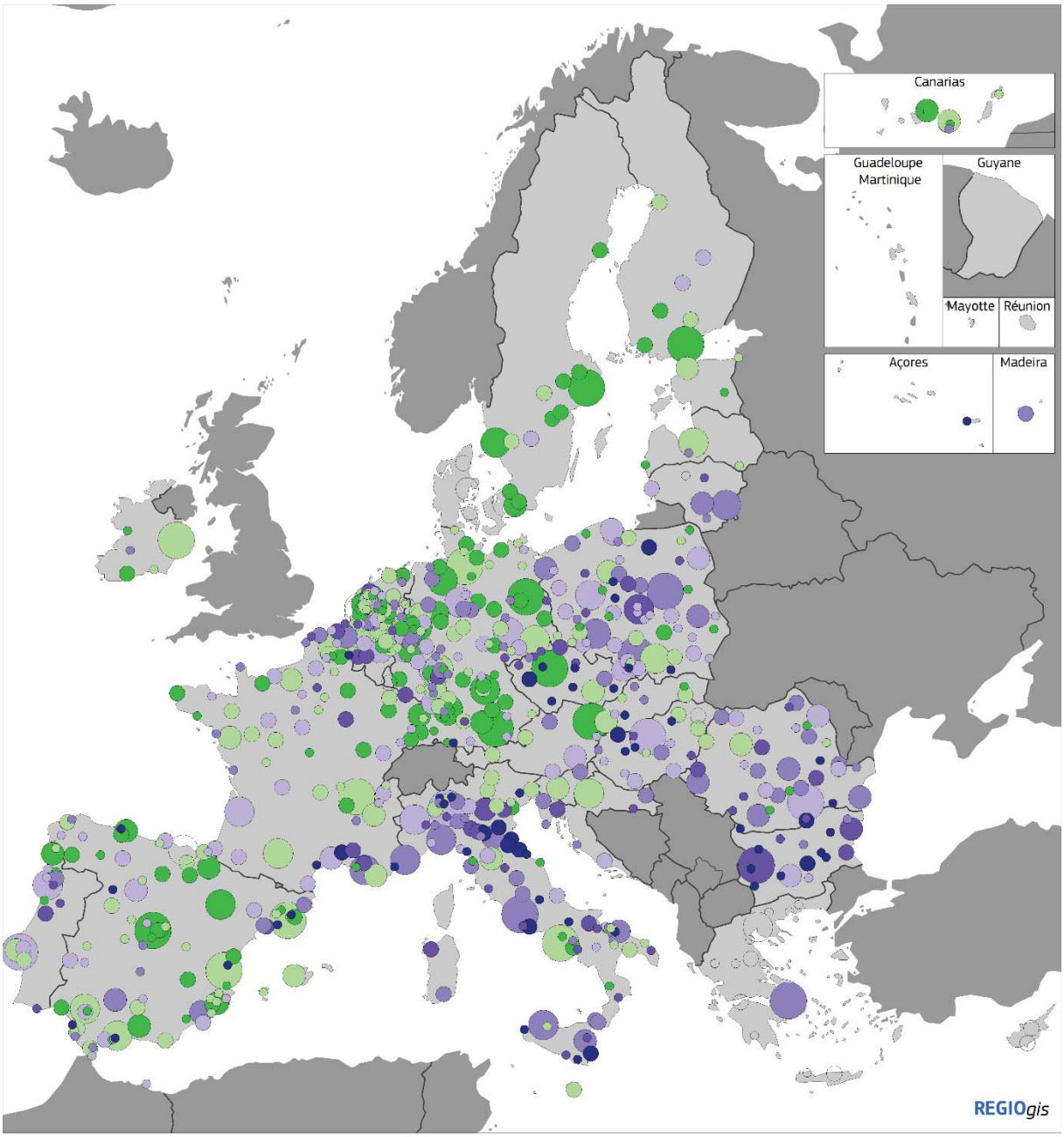
Map 4-9: Road traffic fatalities in EU regions, 2018



Map 4-10: Road traffic fatalities in EU cities, 2018-2019



Road traffic fatalities in cities

Deaths per million inhabitants
- < 15
- 15 - 25
- 25 - 35
- 35 - 50
- 50 - 70
- >= 70
- No data

City population
- < 100 000
- 100 000 - 250 000
- 250 000 - 500 000
- 500 000 - 1 000 000
- 1 000 000 - 5 000 000
- >= 5 000 000

Latest available data (between 2013 and 2019)
The EU target for 2030 is a reduction of 50% relative to 2019, amounting to about 25 road fatalities per million inhabitants.
Sources: Eurostat (urb_ctran) and DG MOVE (CARE database)

0 500 Km

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4.5.BROADBAND CONNECTIONS SHOW AN URBAN-RURAL DIVIDE

Access to high capacity telecommunication networks is a key factor of competitiveness and of the development potential of EU regions. The provision of digital services and the capacity to operate successfully in a global business environment increasingly rely on fast and effective broadband connections. The highly developed regions are in most cases already well-endowed in this regard, but there are still serious gaps in many of the less developed ones. Unless corrected, this difference in broadband connection can further increase territorial disparities in economic growth and levels of prosperity. This is because highly developed regions already have the infrastructure for reaping the benefits and being competitive in an increasingly digital economy, while less developed regions stand to be increasingly excluded from economic opportunities.

4.5.1. Broadband subscription rates are lower in rural areas

Between 2016 and 2020[10], the share of EU households with broadband subscriptions increased from 82% to 89%. The increase was slightly more in rural areas (9 pp) than in cities, towns and suburbs (7 pp) (Figure 4-15). Nevertheless, the share remained higher in cities (92%) than in rural areas (85%), with towns and suburbs in between (90%). The same pattern applies to most Member States, although there are some exceptions where there is little difference between types of area, mainly in small and/or densely populated counties with few remote areas, such as the Benelux countries, Denmark, Malta, and Cyprus. However, in Germany, Slovakia and Poland too, the share of households with broadband is similar in cities, towns and suburbs, and rural areas.

[10] The figure for 2020 for the EU is an estimate

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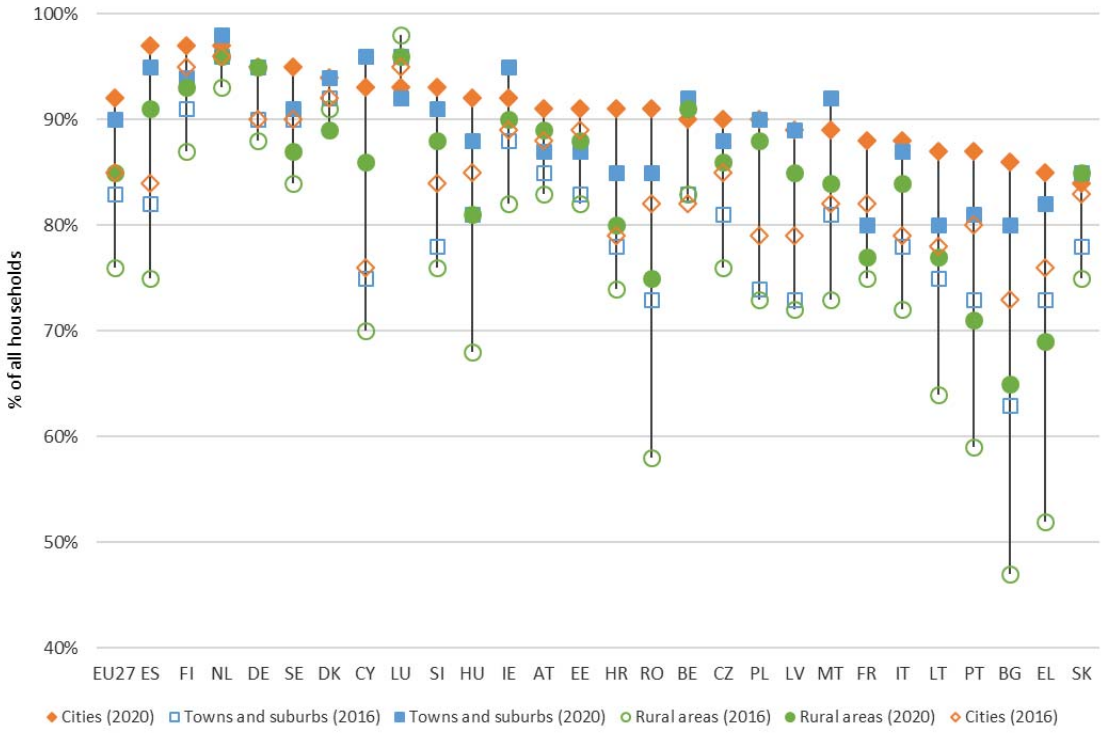
Figure 4-15: Households with broadband subscriptions by degree of urbanisation, 2016 2020



Note: France: 2016 and 2019. The figure for 2020 for the EU is an estimate.
Source: Eurostat [isoc_ci_it_h], DG REGIO calculations

As would be expected, the share of households connected increased between 2016 and 2020 throughout the EU.[11] Over these four years, there was some convergence in the share across the EU, the increase being larger in Member States where the initial share was relatively small.

4.5.2. Broadband connection speed is lower in rural areas

Broadband connection speed is an indicator of the reliability of internet connections for particular activities such as remote working.

Box 4.7: Data on broadband connection speeds

Extensive data on broadband connection speeds in the EU is provided by Ookla for Good™, which contains records of hundreds of millions of consumer-initiated connection speed tests (Speedtest®) for the last quarter of 2020. This section uses the average tested speed at LAU (Local Administrative Unit) level as the basis for the analysis. Note that the speed test data do not provide information on

[11] Luxembourg changed its survey design and data collection methodology in 2018. The shares in 2016 and 2020 are therefore not comparable.

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the broadband coverage or the number of subscriptions per household. The actual connection speed may also vary within LAUs.

In 2016 the EU set a target of having "*access to 30 Mbps or above by all citizens and at least 50% of households with a connection over 100 Mbps*" by 2020.[12] In the Communication "2030 Digital Compass: the European way for the Digital Decade" of 9 March 2021[13] ("Digital Compass Communication") the Commission laid out its vision for 2030 to empower citizens and businesses through the digital transition and set new targets of "*all European households* (being) *covered by a Gigabit network, with all populated areas covered by 5G*".

Concerning the targets for 2020, in only 4 Member States (Denmark, Lithuania, Malta and the Netherlands) did the whole population live in a LAU (Local Administrative Unit) with tested broadband connection speeds above 30 Mbps at the end of 2020 (see Box 4-7), although in 5 other countries, this was the case for over 99% of the population (Figure 4-16). In Slovakia and Greece, over a quarter of the population still lived in an area where connection speeds were below 30 Mbps, and in only 9 Member States were the majority of households in an area with speeds of over 100 Mbps. In Estonia, Cyprus, Slovenia, Greece, Austria and Czechia, less than 10% of the population lived in such areas. These indicators suggest that only Denmark and the Netherlands have achieved both the EU targets but that Sweden and Luxembourg are very close. Thirteen Member States appear to have achieved neither. This implies that the pace of installation of broadband has been too slow in many countries to meet the 2020 target.

Figure 4-16: Population by average tested broadband connection speed in their LAUs , 2020

[12] A connection speed of 30 Mbps is sufficient for one household member to carry out typical household online activities, including teleworking and online learning. However, the required speed increases if multiple users are engaged in activities simultaneously. See for example: https://www.fcc.gov/consumers/guides/broadband-speed-guide.

[13] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "2030 Digital Compass: the European way for the Digital Decade" COM/2021/118 final/2.

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Source: Ookla for Good™, JRC, DG REGIO calculations
Note: The speed refers to the average tested speed of the fastest type of broadband (fixed or mobile) in LAUs.

The average tested speeds of broadband connections show particular spatial patterns, with speeds above 30 Mbps in and around cities being common in all countries (Map 4-11). Outside cities, differences between Member States are more pronounced, with connection speeds above 30 Mbps throughout Malta, the Netherlands, Sweden and Denmark, and lower than this in a large proportion of LAUs outside cities in Latvia, Ireland, Czechia, Slovakia, Greece. A clear digital divide between areas is evident in many countries, including France, Spain, Poland, Hungary and Romania, where (very) high connection speeds in cities contrast with low speeds in other areas.

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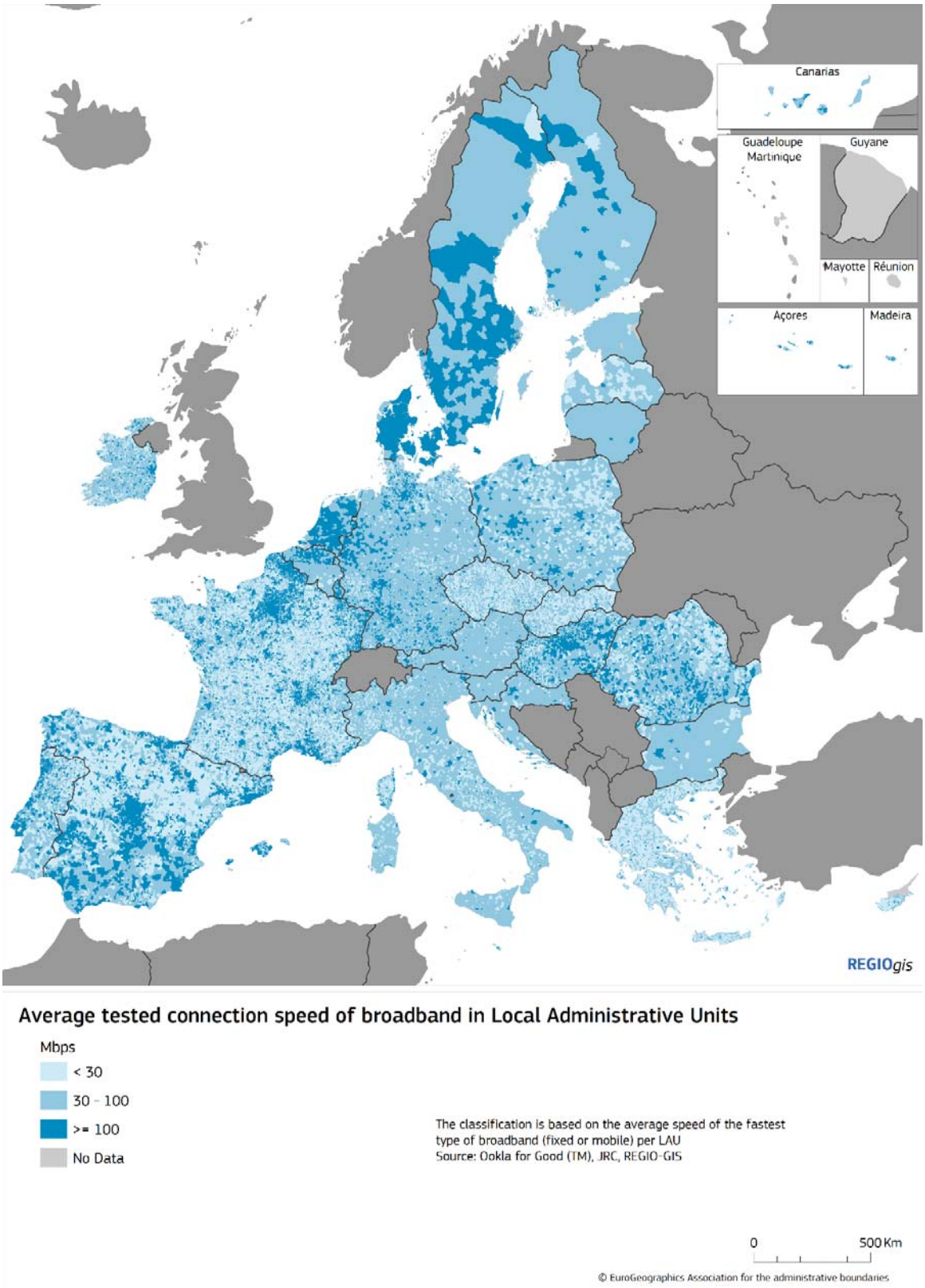
Map 4-11: Average tested connection speed of broadband in LAUs, 2020



Note: The classification is based on the average tested speed of the fastest type of broadband (fixed or mobile) per LAU.
Source: Ookla for Good™, DG JRC (unit B.3), DG REGIO calculations

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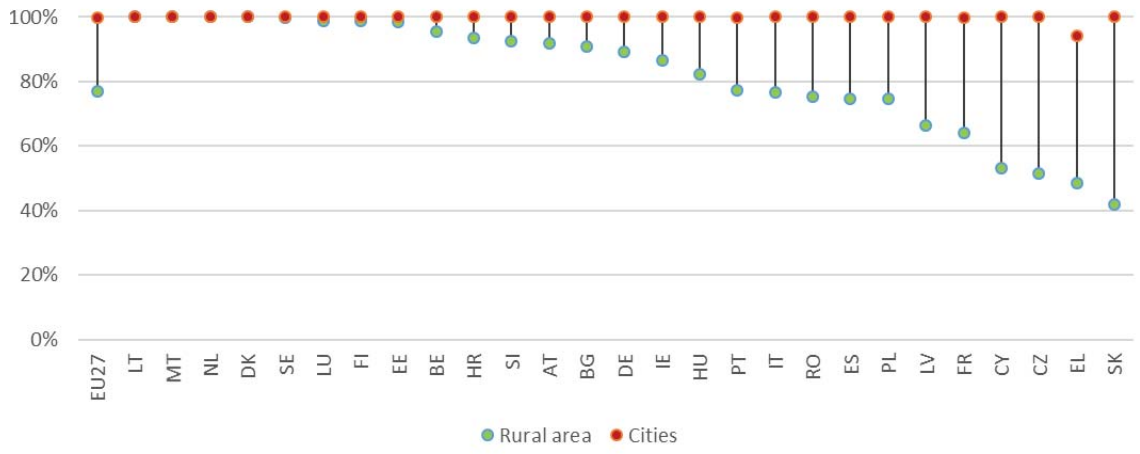
There is a significant divide in broadband connection speeds between cities and rural areas (Figure 4-17 and Figure 4-18). Almost the entire EU population in cities live in LAUs with tested connection speeds above 30 Mbps and a large proportion in LAUs with speeds above 100 Mbps. In rural areas across the EU, by contrast, a substantial share of the population – in Greece and Slovakia, the majority – have to make do with speeds below 30 Mbps. Only in Denmark and Luxembourg do more than half the rural population have access to speeds over 100 Mbps. In France, there are large differences between rural areas, one in five people in these areas having access to speeds above 100 Mbps, but one in three are limited to speeds below 30 Mbps.

Figure 4-17: Population in cities and rural areas with an average tested broadband connection speed in their LAUs of over 30 Mbps, 2020



Source: Ookla for Good™, DG JRC (unit B.3), DG REGIO calculations
Note: The speed refers to the average tested speed of the fastest type of broadband (fixed or mobile) in LAUs.

Figure 4-18: Population in cities and rural areas with an average tested broadband connection speed in their LAUs of over 100 Mbps, 2020

Source: Ookla for Good™, DG JRC (unit B.3), DG REGIO calculations
Note: The speed refers to the average tested speed of the fastest type of broadband (fixed or mobile) in LAUs.

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PART 8/16

COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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CHAPTER 5 A MORE SOCIAL AND INCLUSIVE EUROPE

- Until the COVID-19 outbreak, labour markets in EU Member States and regions were on a steady path to recovery from the adverse effects of the 2008 economic and financial crisis. Only a small impact of the COVID pandemic is visible so far on the employment and unemployment figures. Between 2013 and 2020, the employment rate in the EU of those aged 20-64 rose by 5 pp to reach 72.5%, 0.7 pp lower than in 2019.
- The employment rate in 2020 was 5.5 pp below the EU 2030 target of 78%. The rate was higher in more developed regions (76%) than in transition regions (72%), and lowest in less developed regions (67%), though the latter rose by 7 pp between 2013 and 2020.
- Between 2013 and 2020, unemployment fell in all EU Member States, from a high of 11.4% to 7.1% (up from 6.7% in 2019). The rate was highest in less developed regions (8.8%), followed by transition (7.9%), and lowest in more developed regions (5.6%).
- In 2019, around 91 million people in the EU (20% of the population) were at risk of poverty or social exclusion. The rate was slightly higher in rural areas (22%) than in cities (21%) and in towns and suburbs (19%), but it declined in all three cases between 2012 and 2019.
- Migrants (defined as foreign-born) are concentrated in regions in north-western EU, mainly in cities where economic opportunities are more and support networks most developed. The employment rate of non-EU migrants has increased, but remains lower than for the native-born (62% as against 74% in 2020) in most regions, especially for those with tertiary education.
- The risk of poverty and social exclusion for the non-EU born is double that of the native born, with the rate of material deprivation being particularly high.
- Despite the strong political commitment to achieve gender equality in the EU, large differences remain between women and men in different aspects of life. In 2020, for instance, the employment rate of men aged 20-64 was 11 pp higher than for women, much the same as in 2013.
- Disadvantages faced by women and what they can achieve differ widely across the EU, with women achieving most in Nordic regions and being disadvantaged most in southern and eastern regions.
- The EU regional Social Progress Index, a measure to capture aspects of well-being not fully reflected in GDP, varies greatly across EU regions, with less developed regions scoring particularly poorly and Nordic regions performing well.

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5.1 Before the COVID-19 outbreak hit, labour markets across EU regions were experiencing a period of positive trends.

In 2019, prior to the COVID-19 pandemic, the EU had the highest employment and lowest unemployment rates on record'[1]. The pandemic had only a small impact on these rates.[2] The employment rate for those aged 20-64 in 2020 was only slightly lower than in 2019 (72.5%, down just 0.7 pp), but still 2.5 pp short of the Europe 2020 target of 75%. The Commission has proposed a target of increasing the employment rate to at least 78% by 2030[3]. As of 2020, only five EU Member States had already met this new target: Sweden, Germany, Czechia, Estonia and the Netherlands.

The employment rate in 2020 had returned to pre-crisis levels in all Member States except Greece where, at 61%, it was still 5 pp lower than in 2008. In Hungary, it was 14 pp higher than in 2008 and in Malta, 18 pp higher.

The employment rate, however, varies markedly across regions and types of region (Map 5.1 and Map 5.2). In 2020, the rate in more developed regions averaged 76%, while in less developed regions, it was well below this at 66%, though up 7 pp from 2013, with the average rate in transition regions in between (72%). The employment rate is increasing most in less developed regions - catching up in regions in the eastern EU and recovering in regions in Spain and Portugal – as well as in Ireland, which was hit hard by the economic and financial crisis (Table 5.1).

Between 2013 and 2020, unemployment fell in all EU Member States, from 11.4% to 7.1% (it was 6.7% in 2019). It declined most in Greece, Spain, and Croatia (by 10 pp or more in each case). It was highest in 2020 (at 8.8%) in less developed regions, followed by transition regions (7.9%) and more developed ones (5.6%). On average, the highest unemployment rates were in southern EU regions (12%) and the lowest in eastern ones (4.4%) (Map 5.3 and Map 5.4).

[1] EC, 2020a, p. 13.

[2] While the labour market in the EU has been severely hit by the pandemic and associated containment measures, the impact was mainly on the quarterly (rather than annual) employment figures and on total hours worked. The increase in unemployment was kept down by the job retention schemes introduced by governments (European Central Bank Economic Bulletin 8/2020 and Eurostat Statistics Explained on *Labour markets in the light of the COVID 19 pandemic – quarterly statistics*). The impact of the COVID crisis on total hours worked in EU regions has been considered in the first chapter of this report.

[3] As part of the European Pillar of Social Rights Action Plan that was welcomed by EU leaders during the Social Summit in Porto on 7-8 May 2021 and the European Council on 25 June 2021.

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Table 5.1: Employment and unemployment rates by group of regions and degree of urbanisation, 2020 and changes 2013-2020

		More developed regions	Transition regions	Less developed regions	EU
Employment rate (% of population 20-64)	2020 (%)	76.3	71.8	66.1	72.5
	Change 2013-20 (pp)	+3.5	+4.7	+3.5	+5.0
Unemployment rate (% of labour force 15-74)	2020 (%)	5.6	7.9	8.8	7.1
	Change 2013-20 (pp)	-2.6	-5.0	-6.9	-4.4
		north-western EU	**southern EU**	**eastern EU**	**EU**
Employment rate (% of population 20-64)	2020 (%)	76.4	64.8	73.8	72.5
	Change 2013-20 (pp)	+2.8	+5.5	+8.3	+5.0
Unemployment rate (% of labour force 15-74)	2020 (%)	5.4	12.0	4.4	7.1
	Change 2013-20 (pp)	-2.1	-7.3	-5.7	-4.4
		Cities	**Towns and suburbs**	**Rural areas**	**EU**
Employment rate (% of population 20-64)	2020 (%)	72.2	72.0	73.0	72.5
	Change 2013-20 (pp)	+5.0	+4.2	+5.5	+5.0
Unemployment rate (% of labour force 15-74)	2020 (%)	8.0	6.9	5.9	7.1
	Change 2013-20 (pp)	-4.3	-3.9	-4.9	-4.4

Source: Eurostat table [lfst_r_lfe2emprt] and [lfst_r_lfu3rt], DG REGIO calculations

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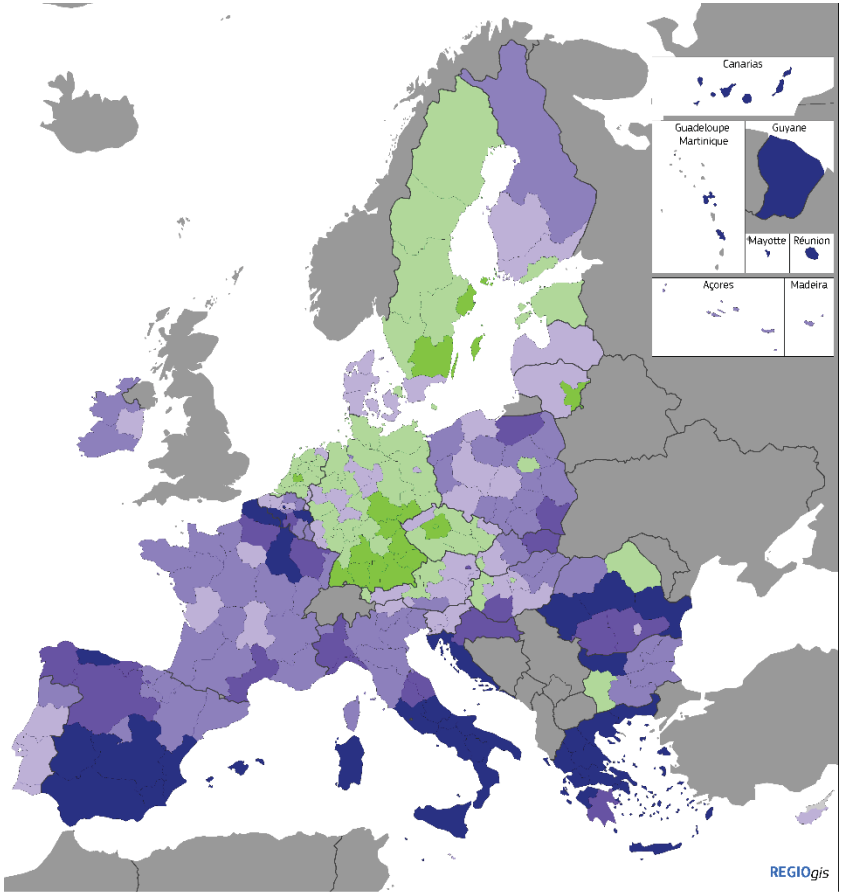
Map 5.1: Employment rate (20-64), 2020



Employment rate (20-64), 2020

% of population aged 20-64

- < 66
- 66 - 70
- 70 - 74
- 74 - 78
- 78 - 82
- >= 82

EU-27 = 72.5
The employment rate target is 78% by 2030.
Source: Eurostat (lfsd_r_lfe2emprt)

0 500 Km

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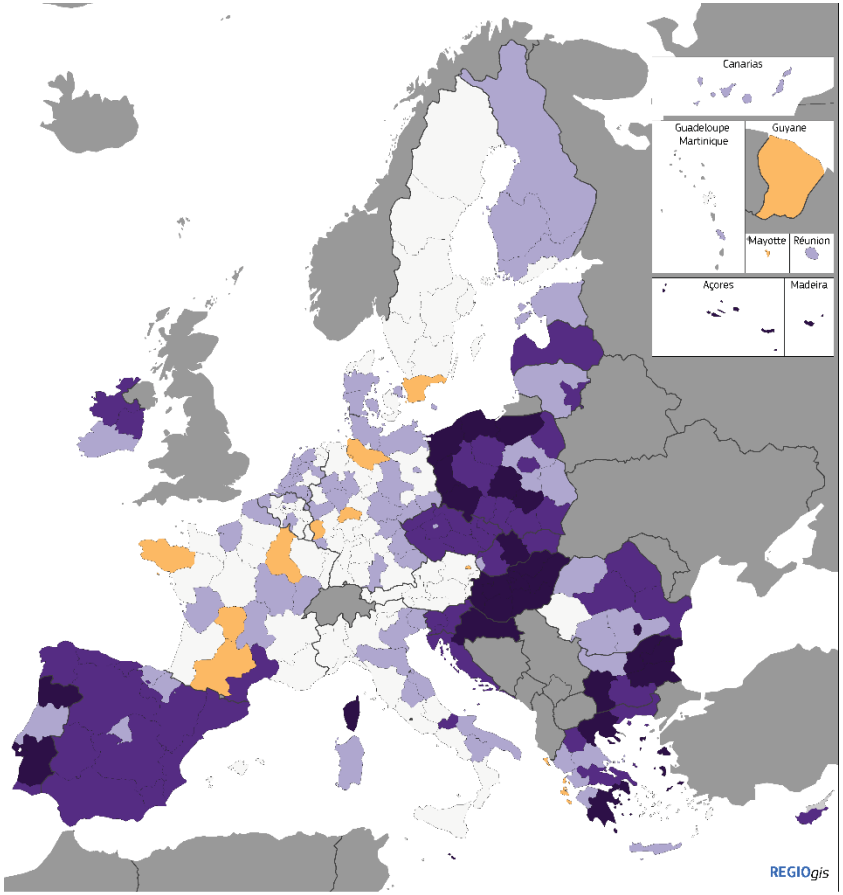
Map 5.2: Change in employment rate (20-64), 2013-2020



Change in employment rate (20-64), 2013-2020

Percentage point change

- <= 0
- 0 - 3
- 3 - 6
- 6 - 9
- > 9

EU-27 = 5
Source: Eurostat (lfst_r_lfe2emprt)

0 500 Km

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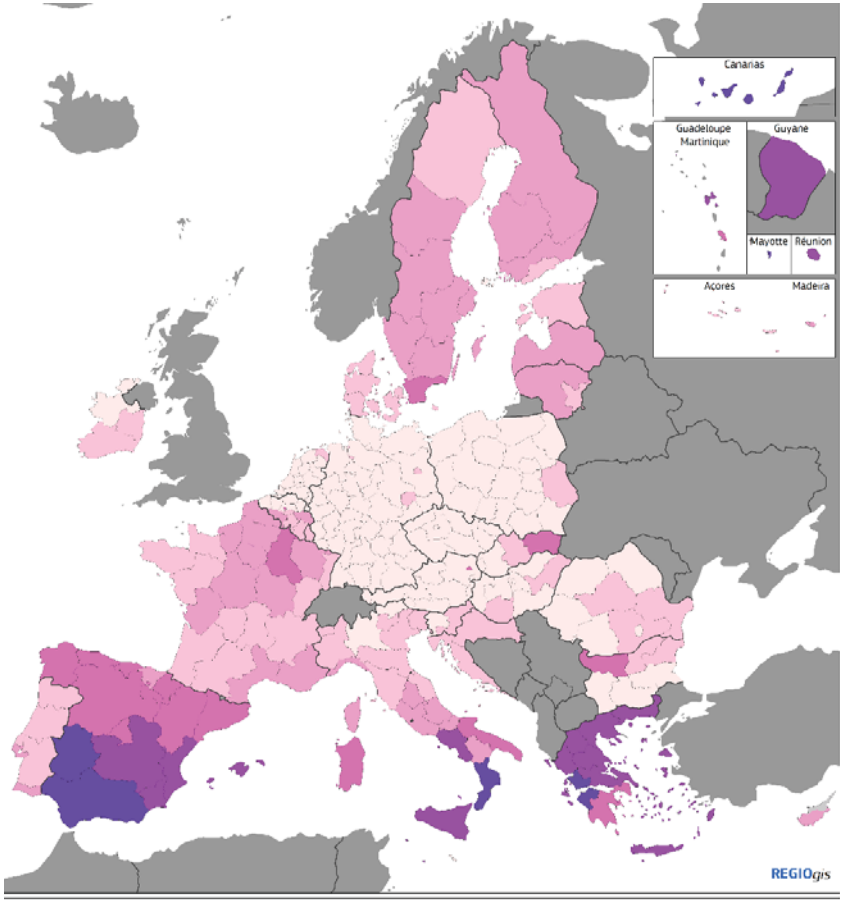
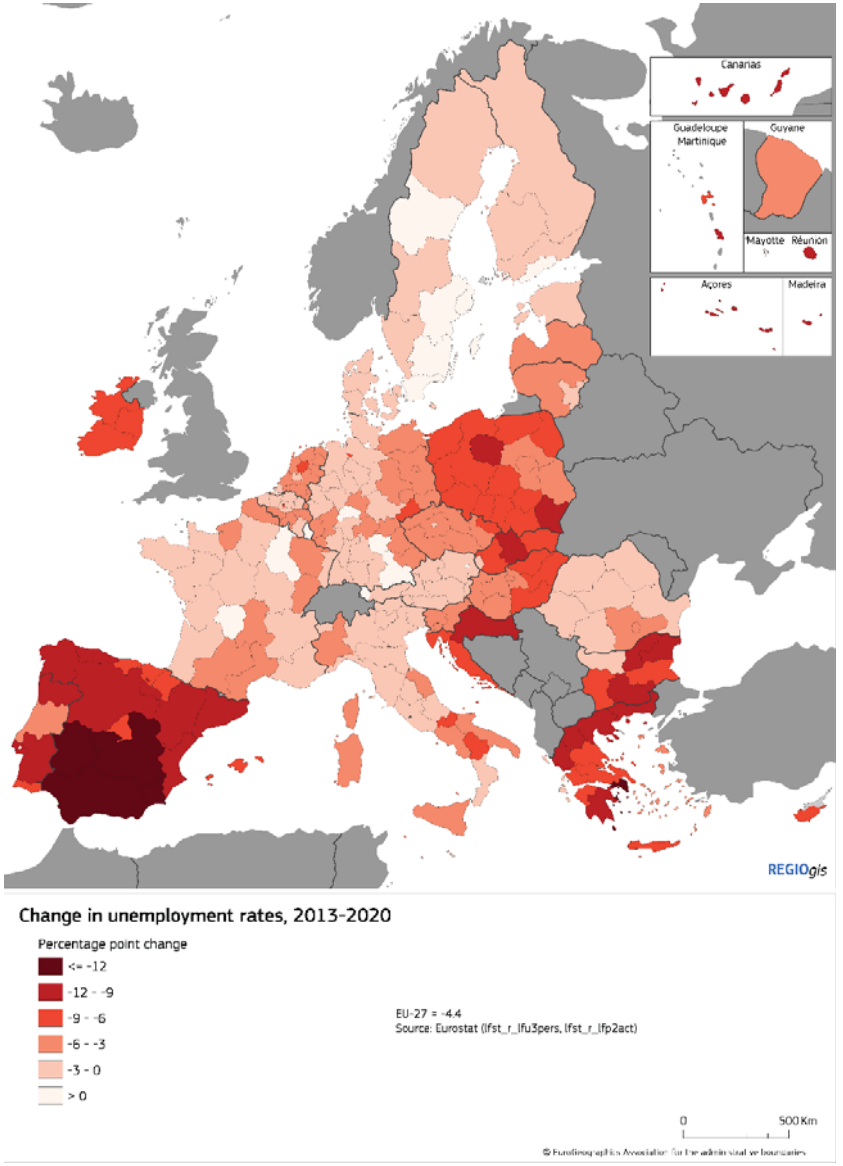
Map 5.3: Unemployment rates, 2020



Map 5.4: Change in unemployment rates, 2013-2020



The unemployment rate is the main indicator used to measure labour under-utilisation in an economy, but it gives only a partial picture of the extent of mismatch between labour supply and demand. The concept of 'labour market slack' (see Box) is instead a measure of the full extent of labour force under-utilisation.

What is labour market slack?

Labour market slack is defined as the sum of those aged 15-74 who are unemployed, under-employed part-time workers, and the potential additional labour force. The latter includes people who are available for work but not actively seeking a job – the so-called 'discouraged' workers – and those seeking work but not immediately available, e.g. those waiting for the results of a job interview.

Labour market slack can be expressed as a share of the extended labour force, the latter including the potential entrants as well as the employed and unemployed as conventionally defined.

For more details, see *Eurostat Statistics Explained*:
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Labour_market_slack_%E2%80%93_annual_statistics_on_unmet_needs_for_employment

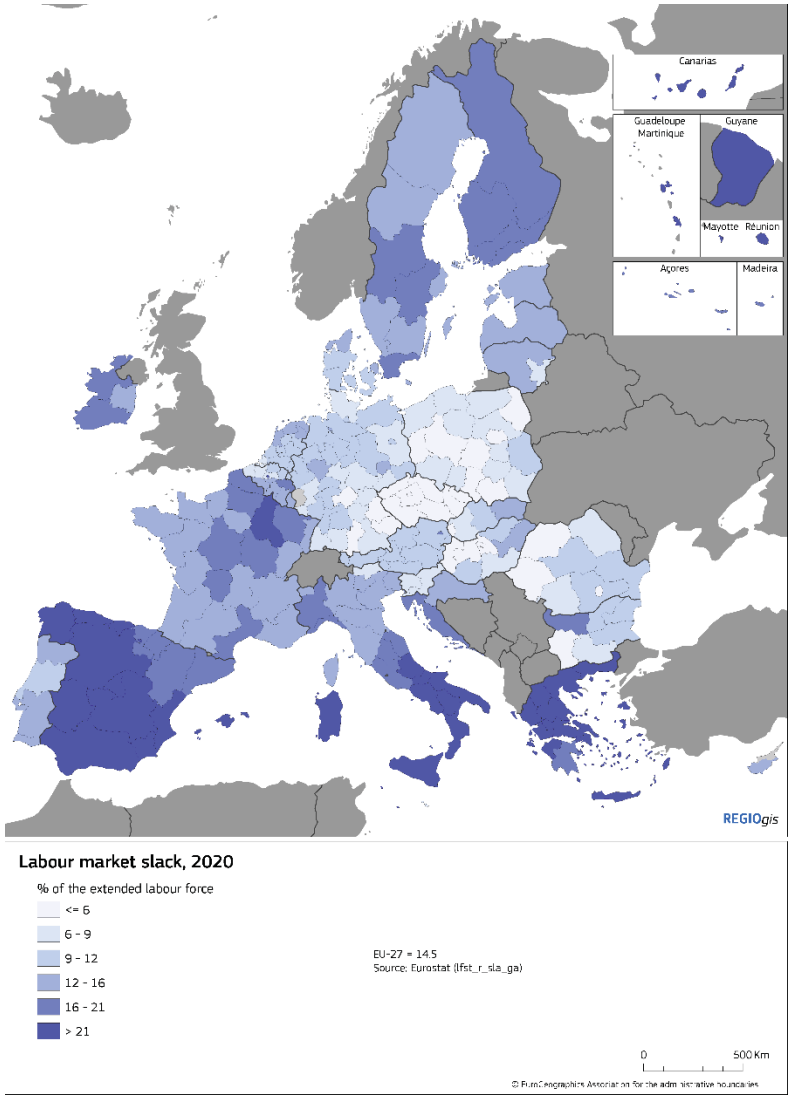
In 2020, labour market slack in the EU amounted to 14.5% of the extended labour force (as against 13.4 % in 2019); more than double the unemployment[4], one of its components, which accounted for 6.7 % of the extended labour force.[5]

Labour market slack exceeds 20% of the extended labour force in a number of regions in southern Italy, Greece and Spain. In the economic recovery from 2013 to 2020, labour market slack diminished in almost all EU regions, particularly those in Spain (Map 5.5 and Map 5.6).

The weight of those not counted as unemployed in labour market slack is substantial in some countries, implying a need for labour market policies to target those concerned. In 2020, in the Netherlands, Ireland and Finland, those not counted as unemployed accounted for over 60% of the slack, whereas in Lithuania, Greece and Slovakia, they made up less than a third.

[4] As share of the extended labour force
[5] For more information, see:
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Labour_market_slack_%E2%80%93_annual_statistics_on_unmet_needs_for_employment#Focus_on_the_potential_additional_labour_force

Map 5.5: Labour market slack, 2020



Map 5.6: Change in labour market slack, 2013-2020

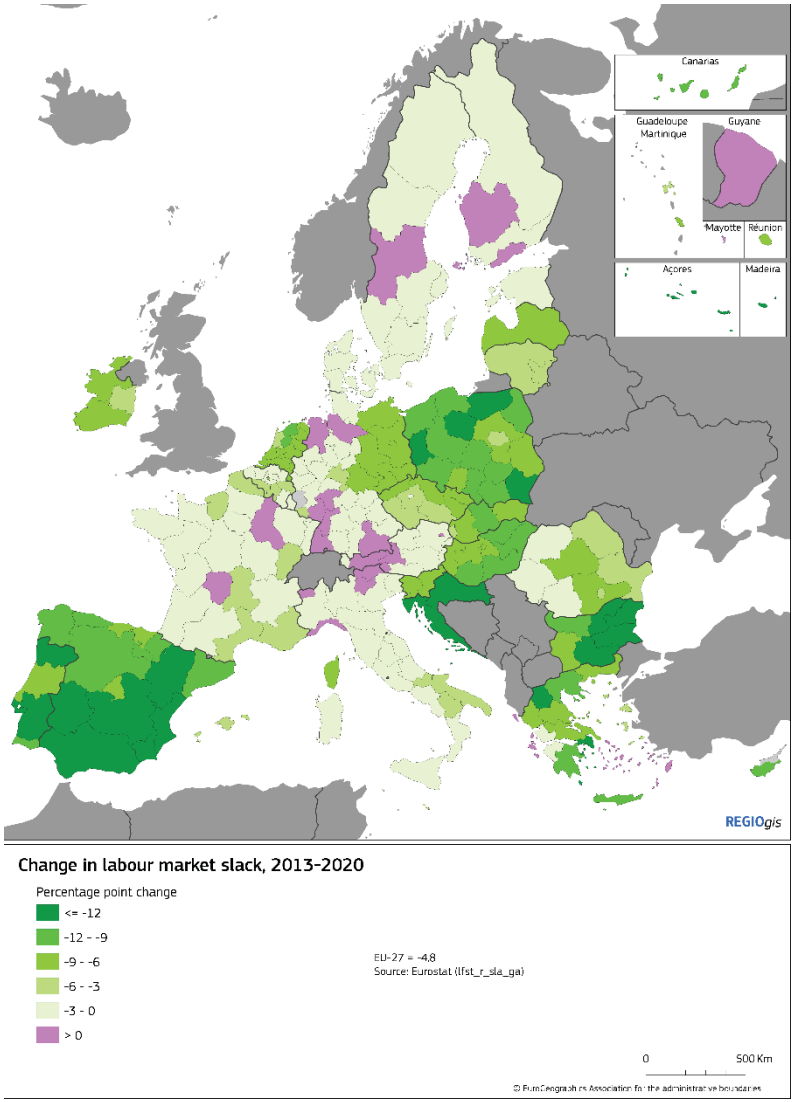


Table 5.2: Labour market slack in the EU by group of regions, 2020 and change 2013-2020

		More developed regions	Transition regions	Less developed regions	EU
Labour market slack (% of extended labour force)	2020 (%)	12.9	16.4	11.9	14.5
	Change 2013-20 (pp)	-4.2	-10.1	-9.6	-4.8
		north-western EU	**southern EU**	**eastern EU**	**EU**
Labour market slack (% of extended labour force)	2020 (%)	13.2	11.8	12.3	14.5
	Change 2013-20 (pp)	-1.7	-18.0	-3.5	-4.8

Source: Eurostat table [lfst_r_sla_ga], DG REGIO calculations

5.2 Regions with large cities have a better-educated labour force, a smaller share of school drop-outs and higher student achievements

With its European Green Deal and Digital Decade, the EU has set ambitious plans to shift towards a climate neutral, fair and digital economy. At the same time, the ongoing digital transformation, speeded up by the COVID pandemic, is changing the way people work (European Commission, 2020a; OECD, 2020). The green and digital transition will create new opportunities but also new challenges.

With adequate accompanying policies in place, this twin transition can boost sustainable competitiveness and create new quality jobs. The impact on employment, however, will vary by occupation, sector, region and country. As a direct and indirect result of the transition, job losses are expected in mining and the extractive industries and in traditional energy production (Kapetaki *et al.*, 2021; Mandras and Salotti, 2021). In addition, other energy-intensive, or hard-to-abate, sectors such as transport and the automotive and steel industries are facing major challenges of restructuring, implying job changes within sectors and regions as well as massive labour reallocation between them. The green transition also poses major social challenges, which will affect disproportionately particular population groups, notably those already in vulnerable situations. For instance, energy poverty affects around 7% of the EU population, i.e. over 30 million people, who are unable to keep their homes adequately warm, many of them living in cities (EC, 2019). This form of poverty affects not only low-income households but also lower middle-income households in many Member States.

To realise the opportunities and mitigate the risks, both digital skills and skills needed for sustainability will become increasingly indispensable not only in nearly all jobs but also in everyday life (for instance, in education and health).

The importance of education and continuing training for economic growth and productivity is also widely recognised in empirical economic research (Mankiw et al., 1992; Hanushek and Woesmann, 2007; Gennaioli et al., 2012; Woesmann, 2016; EC, 2019[6]; EC 2021b[7]). In 2020, the European Commission launched its New Skills Agenda and set a number of target indicators for 2025 to

[6] Chapter 3, Section 2.
[7] Chapter 3, Sections 3.3 and 3.4.

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improve the skills of the work force[8], to support the green and digital transitions and to achieve a fast recovery from the socio-economic impact of the pandemic. On adult learning, for instance, the objectives to be achieved by 2025, as proposed in the Skills Agenda, include at least 50% of people aged 25-64 participating in training during the previous 12 months [9] by 2025 and at least 20% of unemployed adults having recent experience of training. By 2030, it is proposed under the European Pillar of Social Rights Action Plan that at least 60% of people aged 25-64 should participate in training every year.[10]

The 2020 European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience

The 2020 European Skills Agenda is a five-year plan to help individuals and businesses develop more and better skills and put them to use, by:

- Strengthening fairness and sustainable competitiveness, as set out in the European Green Deal.
- Ensuring social fairness, putting into practice the first principle of the European Pillar of Social Rights: access to education, training and lifelong learning for everybody, everywhere in the EU.
- Building resilience to react to crises, based on the lessons learnt during the COVID-19 pandemic.

It builds upon the 10 actions of the Commission's 2016 Skills Agenda. It also links to the:

- European Green Deal
- European Digital Strategy.
- Industrial and Small and Medium Enterprise Strategy.
- Recovery Plan for Europe.
- Increased support for youth employment.

It sets clear and measurable objectives to be achieved by 2025, based on a set of quantitative indicators:

- At least 50% of adults aged 25-64 participating in learning during the last 12 months
- At least 30% of low-qualified adults aged 25-64 participating in learning during the last 12 months
- At least 20% of unemployed aged 25-64 having a recent learning experience
- At least 70% of those aged 16-74 having at least basic digital skills

For more details: https://ec.europa.eu/social/main.jsp?catId=1223&langId=en

[8] COM (2020)274 final, *The European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience*.

[9] The *Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030)* has reduced the reference level to 47%. The indicator measures the share of adults aged 25-64 who report participating in at least one form of formal or non-formal education or training over the 12 months. This is currently measured by the EU Adult Education Survey, which is conducted every 5 years (most recently in 2016). From 2022, this information will also be available from the EU LFS every other year.

[10] The headline target for adult learning welcomed by EU leaders at the Social Summit in Porto in May 2021 and at the European Council in June 2021.

In 2020, around 9% of those aged 25 to 64 participated in lifelong learning[11]. The proportion was largest in the years 2018-2020 in more developed and transition regions, at 13% on average, as against only 5% in less developed regions (Table 5.3). This only partly reflects national tendencies (Map 5.7). In less developed regions, the figure was the same as in 2011-2013, so there was no increase over this 7-year period.

Table 5.3: Life-long learning and early leavers from education and training by group of regions and degree of urbanisation

	More developed regions	**Transition regions**	**Less developed regions**	**EU**
Participation of adults in education and training (% aged 25-64), 2018-2020	12.2	12.4	4.9	9.2
Early leavers from education and training (% aged 18-24), 2018-2020	9.4	9.5	12.1	9.9
	north-western EU	**southern EU**	**eastern EU**	**EU**
Participation of adults in education and training (% aged 25-64), 2018-2020	14.0	8.8	4.5	9.2
Early leavers from education and training (% aged 18-24), 2018-2020	8.9	13.8	8.8	9.9
	Cities	**Towns and suburbs**	**Rural areas**	**EU**
Participation of adults in education and training (% aged 25-64), 2018-20	11.5	8.1	6.8	9.2
Early leavers from education and training (% aged 18-24), 2018-20	8.7	11.2	10.5	9.9

Source: Eurostat tables [tmg_lfse_04] and [edat_lfse_16], DG REGIO calculations

The proportion is smallest in regions in eastern EU (only 4.5% of those aged 25-64 participating in education and training during the preceding 4 weeks in 2018-2020), with no visible change in recent years (Map 5.7 and Map 5.8). It is largest in regions in France, Netherlands, Belgium, Denmark, Finland and Sweden, at over 25%, and larger in cities than other areas.

Reducing high rates of early leaving from education and training should help to improve labour market outcomes and eradicate pockets of socio-economic deprivation (De Witte and Rogge, 2013; Hanushek and Woesmann, 2007). Research shows that those dropping out of education prematurely have a

[11] The indicator measures the share of people who participated in education or training in the preceding 4 weeks. It differs significantly from the target of 'taking part in learning during the last 12 months.

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higher risk of being unemployed, working part-time or having a fixed-term contract than those completing secondary education. It also shows that they tend to earn less (Campolieti et al., 2010; Falch et al., 2010; Brunello et al. 2012) and are in poorer health (Arendt 2005; Kempter et al. 2011; Brunello et al. 2013).

A newly-agreed target at EU level is to reduce the share of early leavers - those aged 18-24 with no qualifications beyond basic schooling and no longer in education or training – to 9% or less by 2030.[12] This compares with 9.9% in 2020, though with wide differences between and within countries, the share ranging from 3.8 % in Greece to 16.7 % in Malta.

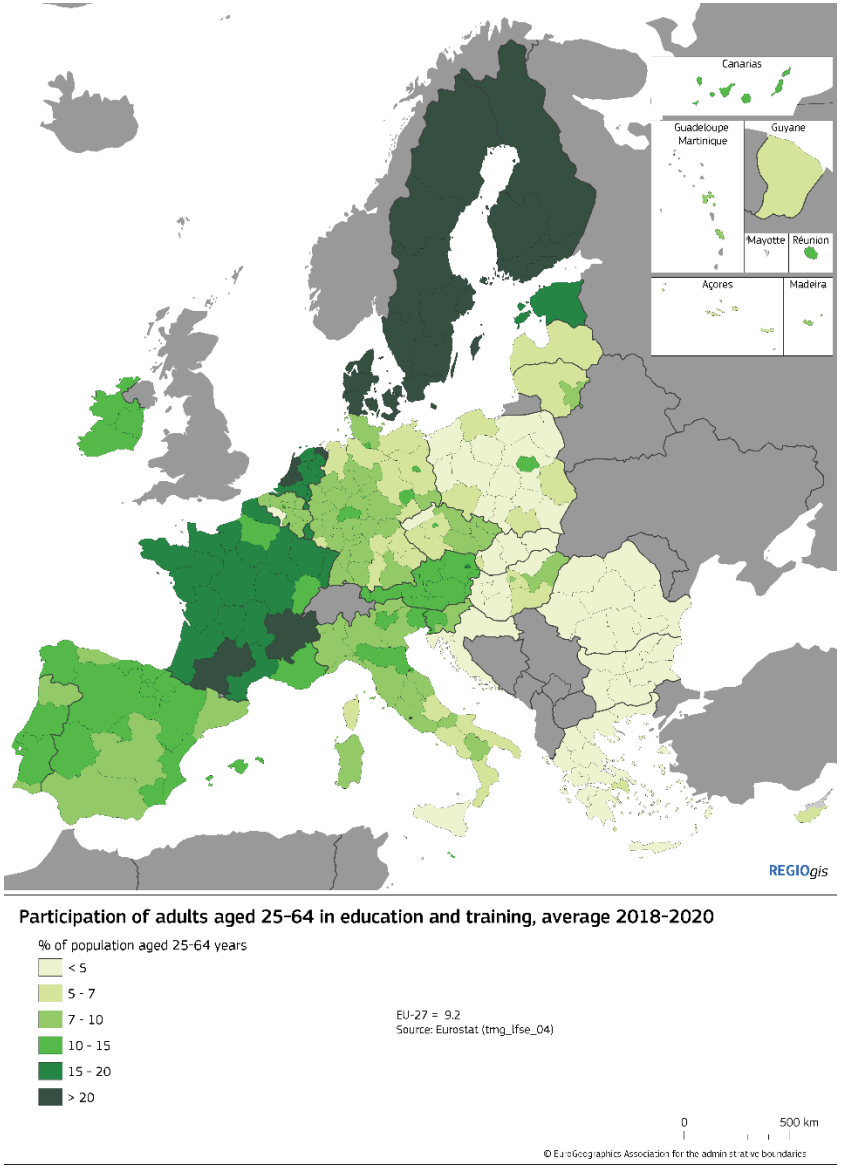
At regional level, the largest shares of early leavers are in Spain, southern Italy, Bulgaria and Romania, with figures of around 25% in Ceuta and Melilla in Spain, Yugoiztochen in Bulgaria and the two outermost regions of Açores in Portugal and Guyane in France (Map 5.9). Nevertheless, the share fell substantially (by over 10 pp) in regions in Spain and Greece as well as in Portugal between 2011-2013 and 2018-2020 (Map 5.10).[13] It increased - with increases of more than 4 pp - in the regions of Dél-Dunántúl and Észak-Magyarország in Hungary, Yugoiztochen in Bulgaria, Východné Slovensko in Slovakia and Severozápad in Czechia.

The share also varies between cities (8.7 % in 2020), where it is already below the 2030 target, towns and suburbs (11.2 %) and rural areas (10.5 %).

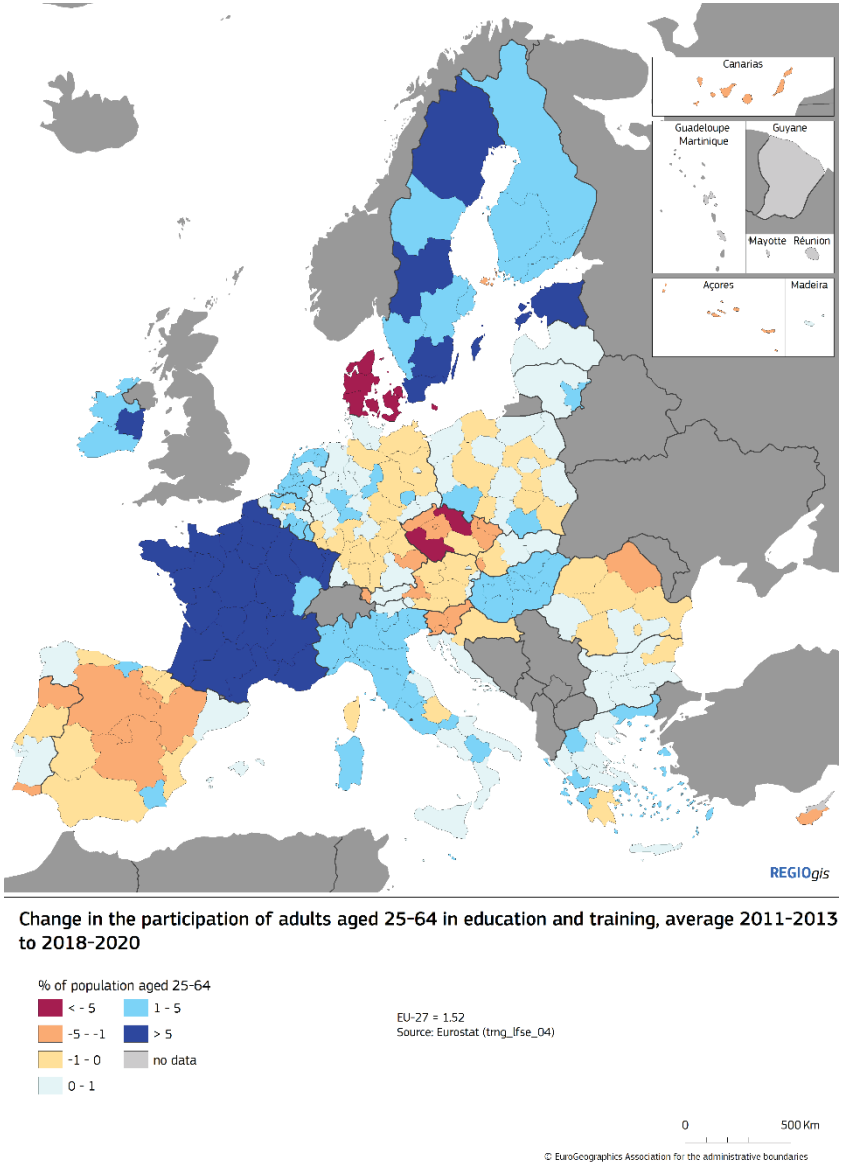
In more developed and transition regions, the share is only slightly above the target (around 9.5% in both in 2018-2020), while in less developed regions, it is much further above (12.1%), due to a high share of early leavers in regions in southern EU (Table 5.3). Early leavers increased in all three regional groups between 2011-13 and 2018-20.

[12] Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030) 2021/C 66/01.
[13] A 3-year average has been used because of data reliability issues at NUTS2 level.

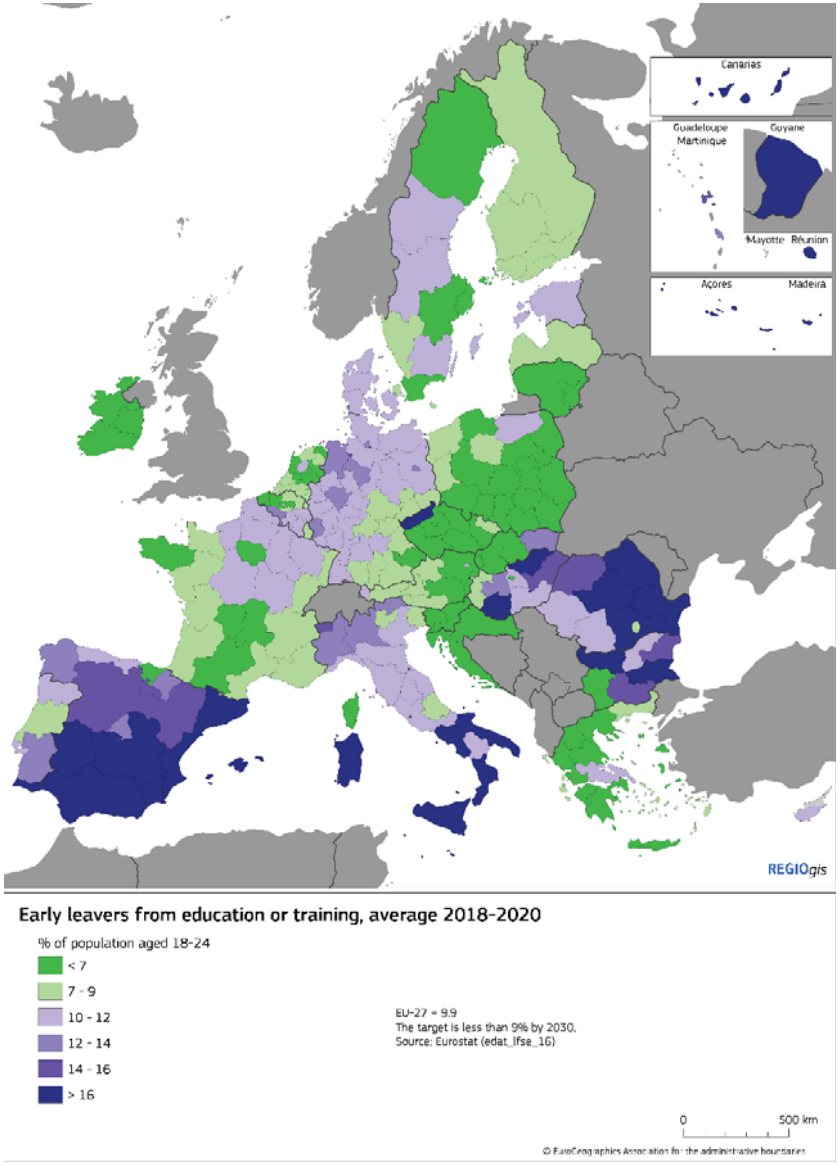
Map 5.7: Participation of adults aged 25-64 in education and training, average 2018-2020



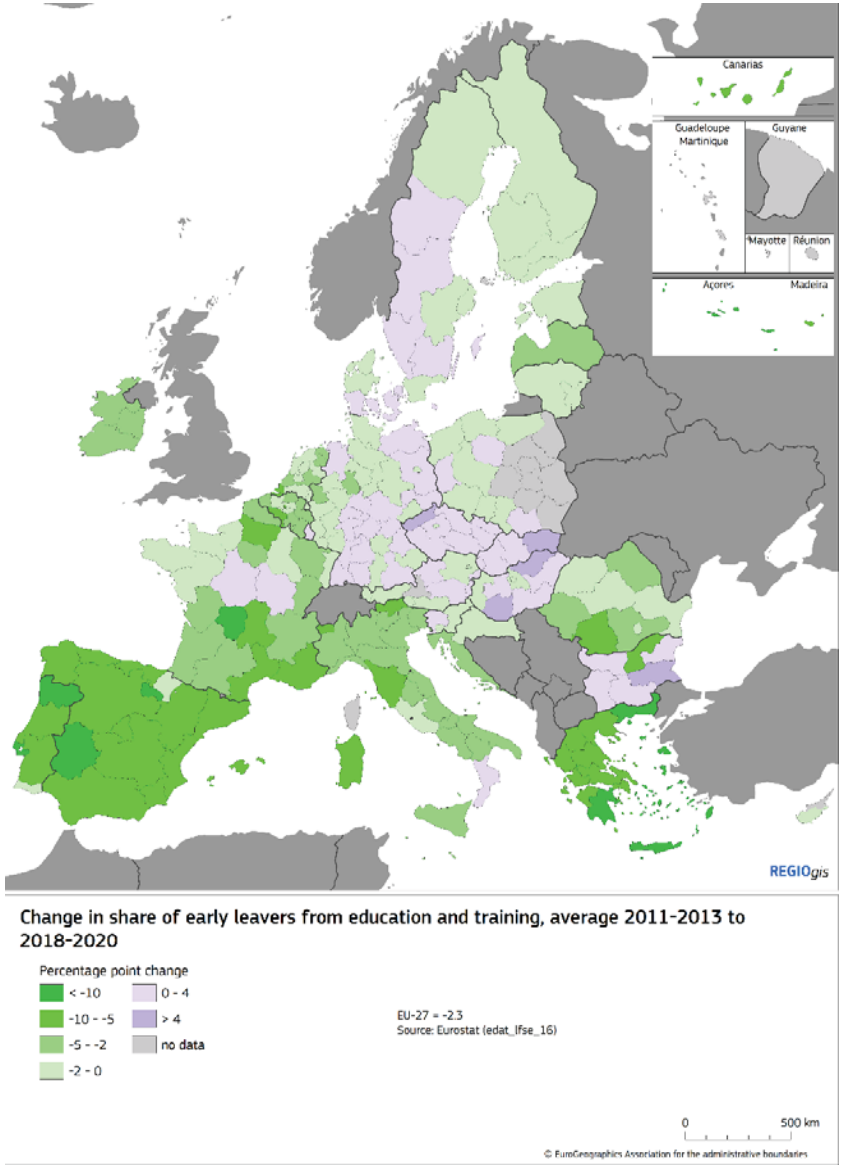
Map 5.8: Participation of adults aged 25-64 in education and training, change since 2011-13



Map 5.9: Early leavers from education or training aged 18-24, average 2018-2020



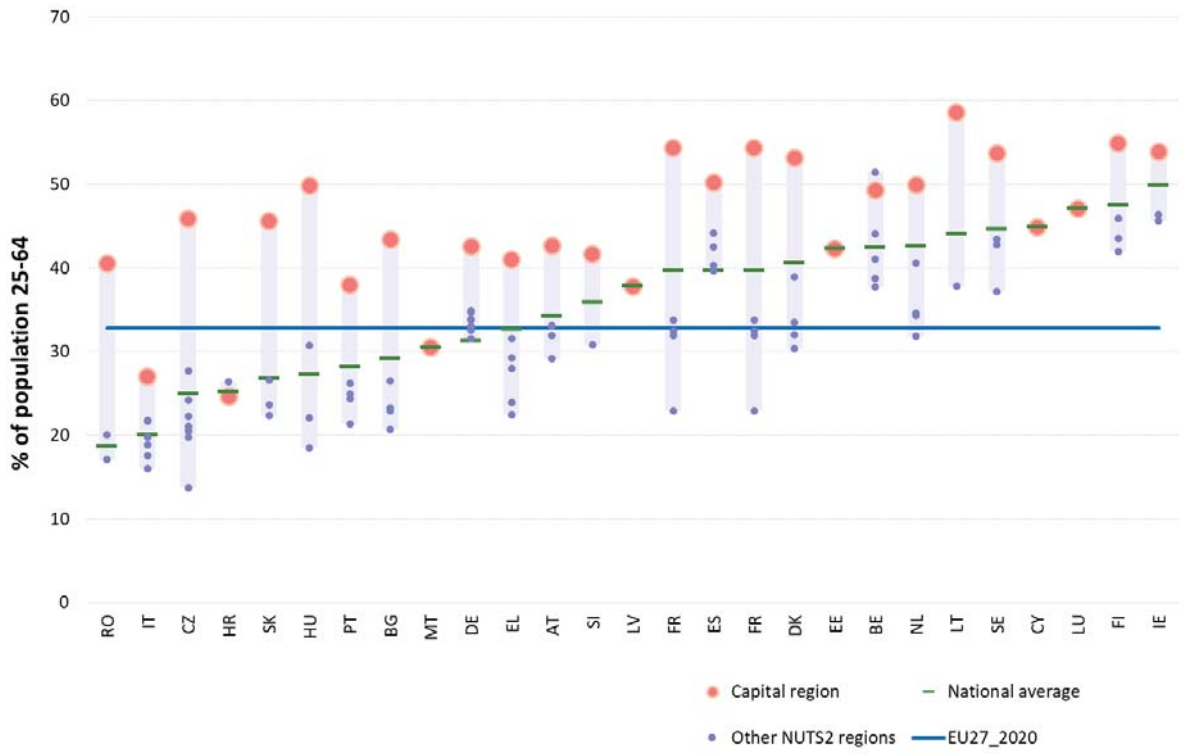
Map 5.10: Early leavers from education or training aged 18-24, change since 2011-2013



Highly skilled workers live mainly in EU capital city regions.

A well-educated work force is key to economic development and prosperity. University education boosts upward social mobility and improves employment prospects. The share of those aged 25-64 with tertiary education, however, varies markedly across regions (Figure 5.1). Capital city regions tend to have a more highly-educated population than others.[14] Demand for highly-skilled labour attracts those with tertiary education and makes it easier for them to find a job matching their skills. At the same time, firms are also more likely to find the skills they need in such areas. In most Member States, therefore, university graduates are concentrated in and around the capital city region.

Figure 5.1: Regional variations in shares of those aged 25-64 with tertiary education (ISCED 5-8), 2020



Note: Member States are ranked by national averages
Source: Eurostat table [edat_lfse_04], DG REGIO calculations

[14] European Union and UN-HABITAT (2016).

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Main labour market and education indicators in EU outermost regions

The EU has 9 outermost regions (grouped into 8 NUTS 2 regions), where around 5 million people live.* They are geographically remote from the continent in the Caribbean basin, Macaronesia and the Indian Ocean. In 2020, employment rates in all outermost regions were below the EU average, ranging from 43% in Mayotte to 71% in Região Autónoma dos Açores. Only the latter had an unemployment rate below the EU average (6.1%), rates in Canarias and Mayotte being over three times higher than the average. Despite high unemployment rates, Canarias is the only outermost region where the proportion of those aged 25-64 with tertiary education is above the EU average (34.4% in 2020); in all other regions, it is well below (see table below).

	Employment rate (%population aged 25-64), 2020	Unemployment rate (% of labour force), 2020	Tertiary educated (% population aged 25-64), 2020
EU-27	**72.3**	**7.1**	**32.8**
Canarias	57.1	22.6	34.4
Guadeloupe	56.3	17.5	23.3
Martinique	62.4	12.4	27.1
Guyane	49.5	16.1	18.7
La Réunion	54.0	17.4	22.9
Mayotte (2019)	43.3	30.1	not available
Região Autónoma dos Açores	71.1	6.1	15.8
Região Autónoma da Madeira	70.9	8.1	22.9

* The 9 outermost regions (Saint-Martin is part of the NUTS 2 region of Guadeloupe) are governed by the provisions of the Treaties and form an integral part of the Union.

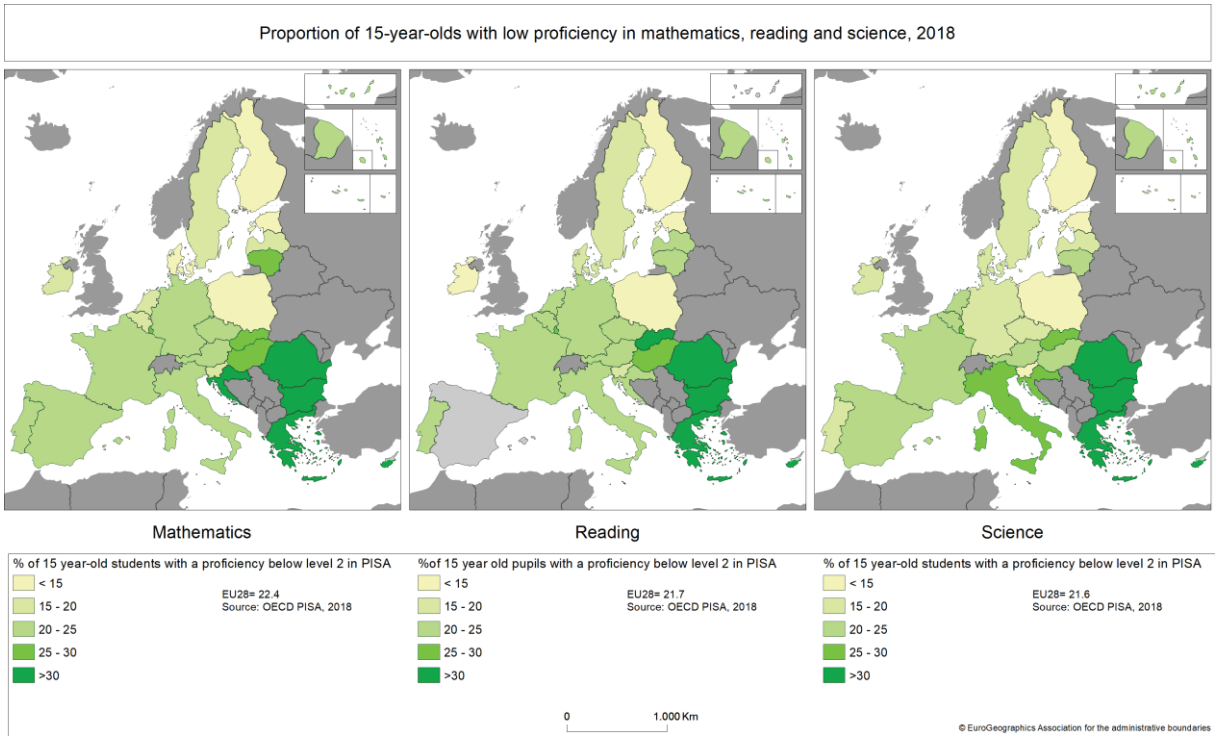
Note: Employment and unemployment rates for Mayotte are from 2019 for reliability issues.
Source: Eurostat tables [lfst_r_lfe2emprt] and [lfst_r_lfu3rt], DG REGIO elaboration

The strategic framework for European cooperation in education and training (ET2020) sets a target of reducing the underachievement of 15 year-olds in reading, maths and science to 15% or less, on the grounds that: *''underachieving in basic skills implies not being equipped to thrive in the labour market and the broader society. Therefore, the cost of underachievement is significant both for the individual and for society at large''* (Source: 2020 European Education Monitor).[15]

According to the 2018 PISA survey (the OECD Programme for International Student Assessment) the majority of EU Member States have not yet reached this target, with around 22% of those tested having a low proficiency in each of maths, reading and science (Map 5.11). The largest proportions with low proficiency (over 38% in all three disciplines) were in Bulgaria, Romania and Cyprus, while, at the other end of the scale, Finland, Estonia, and Poland had reached the 15% target and Denmark, Ireland and Slovenia were close to it. Achievement levels also differ between schools in rural areas and cities.

[15] Source: European Commission, 2020 European Education Monitor, available at: https://op.europa.eu/webpub/eac/education-and-training-monitor-2020/en/

Map 5.11: Proportion of 15-year-old with low proficiency in mathematics, reading and science.



Source: OECD, PISA 2018, DG REGIO calculations

The OECD assessed performance by school location in 2015 for science and in 2018 for reading.[16] Performance in science was higher in cities than in rural areas and villages in all Member States covered by the survey, except for Belgium (Figure 5.2).[17] The urban-rural divide in this regard is particularly marked for schools in Bulgaria and Hungary. Students in city schools score up to around 30 points higher in science than those in rural schools (roughly equivalent to one year of schooling). The gap remains significant (around 16 points), after allowing for differences in the economic status of schools and students.[18]

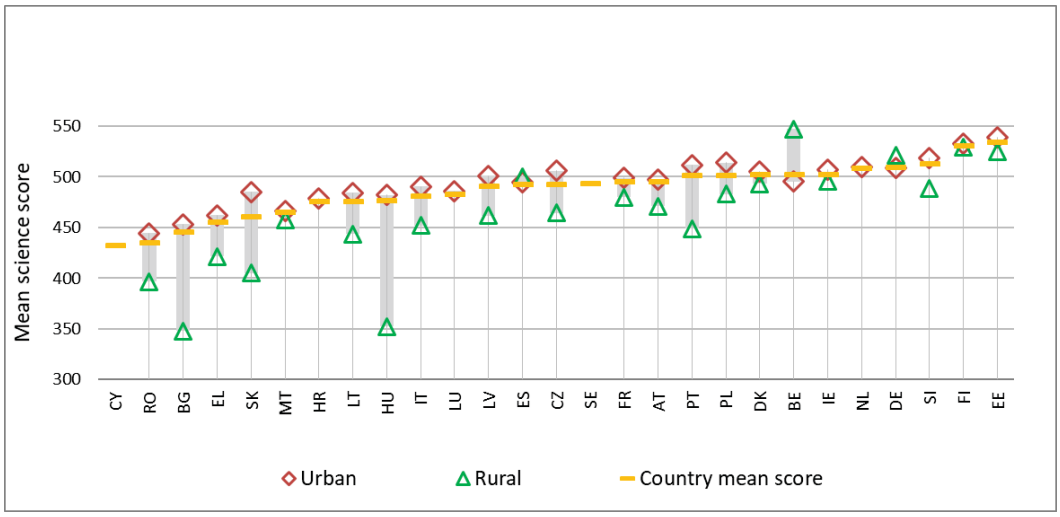
Reading performance in 2018 was higher in urban than in rural areas in all Member States covered by the survey, though there were marked differences in the size of the gap. While it was negligible in Austria, Sweden, Denmark and Ireland, it was substantial in Romania, Bulgaria, Hungary, Slovakia and Portugal (Figure 5.3).

[16] The OECD-PISA approach allocates schools to rural areas if they are in "a village, hamlet or rural area with fewer than 3 000 people", to towns if they are in settlements with between 3 000 and 100 000 inhabitants; and in cities if they are in settlements with more than 100 000 people. Performance in science was not assessed by school location in 2018.

[17] 'Urban' is the average of scores in towns and cities.

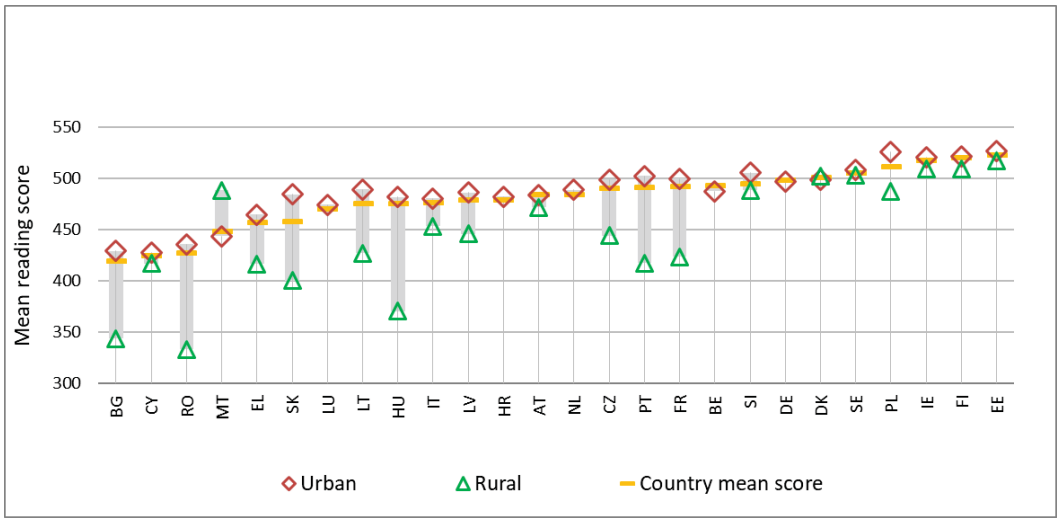
[18] For more detail, see: Echazarra, A., and Radinger, T. (2019).

Figure 5.2: Science performance by school location, PISA 2015



Note: Member States ranked by country mean scores. CY and SE: no data by school location; HR, NL and LU: no data for rural areas. 'Urban' is the average of scores in cities and towns.
Source: OECD, PISA 2015. DG REGIO calculations

Figure 5.3: Reading performance by school location, PISA 2018



Note: Member States ranked by country mean scores. ES: no data. BE, NL, DE, HR, and LU: no data for rural areas. 'Urban' is the average of scores in cities and towns.
Source: OECD, PISA 2018. DG REGIO calculations

"Rapid digitalisation over the past decade has transformed many aspects of work and daily life. [...] Basic digital skills should become part of the core transferable skills that any citizen should have to be able to develop personally; engage in society as an active citizen; use public services; and exercise basic rights".[19]

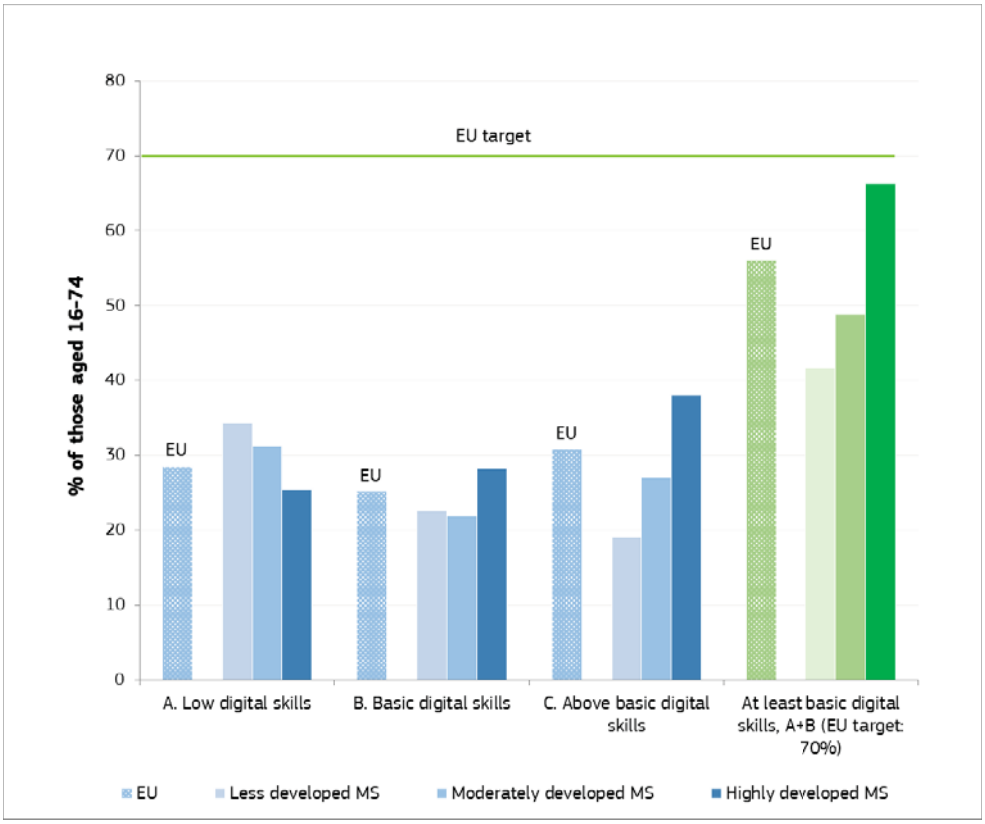
Ensuring that everyone has the right skills for an increasingly digital world is essential for an inclusive labour market and to spur innovation, productivity and growth (OECD, 2016). The newly agreed target at the EU level is that by 2025, at least 70% of those aged 16-74 should have at least basic digital skills. In 2019, the proportion was only 56%. The proportion in more developed Member States alone (66%) was close to the target, while in moderately developed (49%) and less developed Member

[19] European Commission (2021), Digital Education Action Plan 2021-27, pages 3 and 9.

States (42%) it was well below (bars in green in Figure 5.4). In the EU, around 29% of those aged 16-74 reported having a low level of digital skills and 25% a basic level, only 31% reporting having a level higher than basic (Figure 5.4). The difference in the latter proportion between highly developed Member States and less developed was especially pronounced –43% as against only 24%. The share of rural residents that have at least basic digital skills is 14 pp lower than of city residents.

These differences are a matter of concern. As the demand for digital skills and educated workforce increases, areas with poor performance risk missing out from being able to take advantage of new economic opportunities and may limit the uptake of e-services. This also depends on the availability and affordability of high-speed infrastructure.

Figure 5.4: People's levels of digital skills, by Member State level of economic development, 2019



Source: Eurostat tables [isoc_sk_dskl_i] and [demo_pjan], DG REGIO calculations
Note: Except for the EU average, darker colours denote higher levels of economic development. For country groupings by level of development, see Glossary. Latest year available: 2019

Average digital skills intensity[20] of occupations in the labour market varies markedly between EU Member States (EC, 2021b). Over the past decade, signs of convergence can be seen at country level but this is not so at regional level (Figure 5.5). Across EU regions, there is no evidence over the period 2011-2019 of a faster growth in digital skills in regions with low initial levels (in 2011).[21]

[20] The *digital skills intensity* indicator measures the average number of digital skills used by a worker based on his or her ISCO occupational classification. For more details on the index, see Barslund (2021, *forthcoming*).
[21] Source: EC (2021b), chapter 3.

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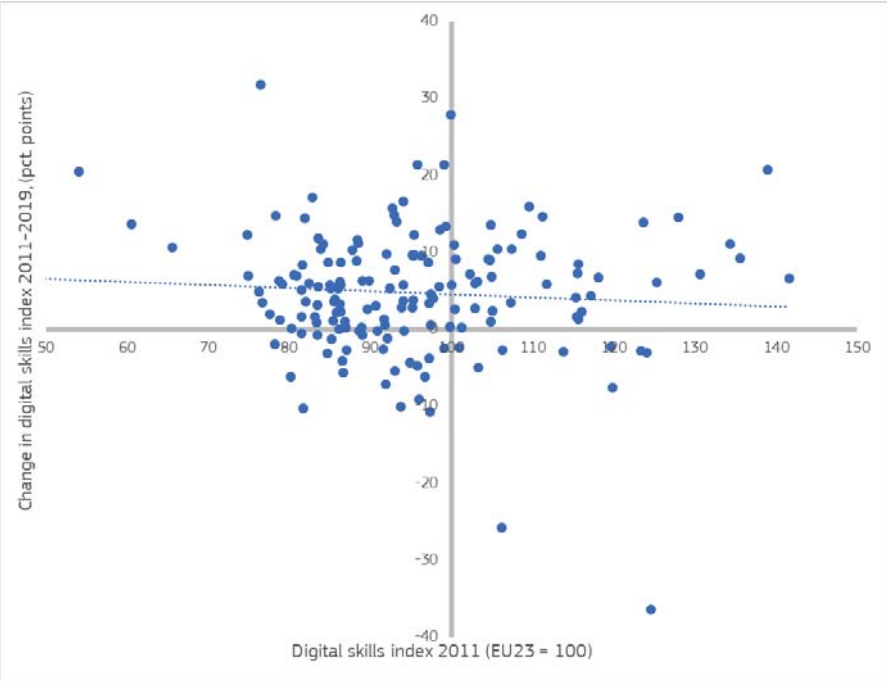
Figure 5.5: Change in digital skills in NUTS 2 regions, 2011-2019 relative to digital skills in 2011



Source: Barslund (2021, *forthcoming*)

The Skills-OVATE tool

Better skills intelligence can channel migration towards the regions and occupations experiencing skill shortages. The EU aims to make skills intelligence more accessible by publishing online 'real-time' information on skills demand at regional level. The Skills-OVATE tool, developed with CEDEFOP, provides detailed information on jobs and skills published by employers in online job adverts and indicates the intensity of demand for different occupations in all EU countries, broken down by sector and NUTS 2 region. As such, it potentially provides a way of tackling regional skills disparities on the labour market. The tool, which has recently been improved, is to be included in the Europass portal.
For more details: https://www.cedefop.europa.eu/en/data-visualisations/skills-online-vacancies

EU support for strategic national upskilling action (Action 3 of the 2020 European Skills Agenda)

The Commission plans to help Member States to prepare holistic, all-of-government national skills strategies, building on the work already undertaken with the OECD in 11 Member States as well as on existing national strategies. It will help to establish or review strategies where needed and to monitor progress in implementing them. It will encourage the rejection of gender and other discriminatory stereotypes and put a particular emphasis on the importance of transversal and entrepreneurial skills, as well as the skills needed for digital and green transitions, such as those acquired through Science, Technology, Engineering and Mathematics (STEM) studies.

The Commission will join forces with the European Network of Public Employment Services to develop peer learning events to spotlight skills needed on the labour market, particularly for the unemployed and those in short-time work and to strengthen skills intelligence and skill matching in the light of the long-term challenges stemming from the green and digital transitions. Activities will focus on increasing the provision of guidance services, including for those in employment, particularly vulnerable groups, and on closing skills gaps, notably digital. The opportunities offered by cross-border cooperation will also be explored.

Through the recently adopted Pact on Migration and Asylum, the Commission will aim to improve legal pathways to the EU, including by relaunching the negotiations on the Blue Card Directive to attract highly skilled workers. The Pact will provide credible offers of legal migration places as part of new talent partnerships with third countries and explore new means of legal migration.

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PART 9/16

COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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5.3 Poverty and social exclusion have declined in the EU, but remain high in the southern EU and in rural areas in the eastern EU

In 2019, around 91 million people in the EU (17.9 million of them were children aged 0-17) were at risk of poverty or social exclusion (AROPE – see Box), this amounts to 20% of the total population. The EU has a target of reducing the number concerned by at least 15 million by 2030.[22]

Box. What it means to be at risk of poverty or social exclusion

Those at risk of poverty or social exclusion (AROPE) in the EU are identified through a combination of three indicators:

- **At risk of poverty** (or relative monetary poverty), defined as living in a household with equivalised[1] disposable income in the previous year below 60% of the national median.
- **Severe material deprivation,** as being unable to afford any 4 or more of 9 items included in the EU-SILC survey.[2]
- **Living in a households with very low work intensity,** defined as living in a household where those aged 18-59 worked for only 20% or less of the time they could potentially have worked during the past year if they had worked full-time throughout the year.

People identified as being at risk of poverty or social exclusion are those recorded under any one of these three indicators.

EU Statistics on Income and Living Conditions (EU-SILC)

The EU Statistics on Income and Living Conditions (EU-SILC) are the main source of data in the EU on poverty and social exclusion. The survey from which the statistics derive covers a representative sample of households in all Member States. The survey is carried out each year and the data on income, and therefore on the risk of poverty and work intensity, relate to the year preceding the survey – i.e. for the 2019 survey, the risk of poverty and low work intensity relate to 2018 – while material deprivation relates to the year of the survey, i.e. 2019.

See: https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions

[1] *Equivalised* means that income is adjusted for differences in the size and composition of households.

[2] The 9 items are a colour TV, a washing machine, a telephone, a car, a meal of meat or fish or the equivalent every other day, a week's annual holiday away from home, an ability to avoid being in arrears on mortgage payments, rent, utility bills, hire purchase instalments or loans, an ability to make ends meet and an ability to keep the house adequately warm.

Having peaked at 24.9% in 2012, the proportion of people at risk of poverty or social exclusion fell over the following seven years, mainly because of a sharp decline in severe material deprivation (from 10.2% in 2012 to 5.4% in 2019). Marked variations exist between EU regions (Map 5.12), with a large share of population at risk (above 30%) in a number of regions in Spain, Italy, Greece, Romania and Bulgaria.

[22] According to the headline target set in the European Pillar of Social Rights Action Plan (https://ec.europa.eu/info/strategy/priorities-2019-2024/economy-works-people/jobs-growth-and-investment/european-pillar-social-rights/european-pillar-social-rights-action-plan_en), welcomed by EU leaders at the Porto Social Summit and the European Council.

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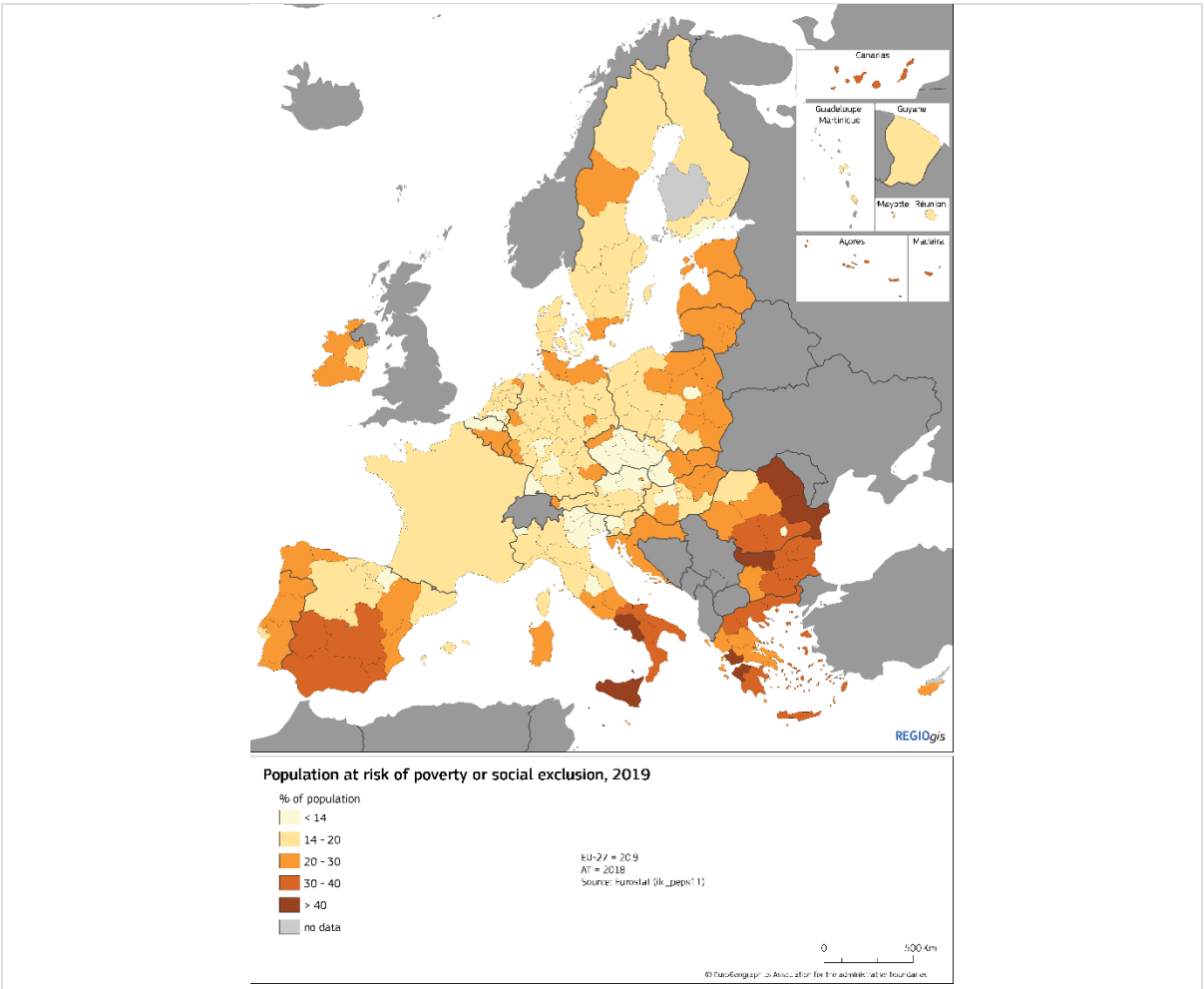
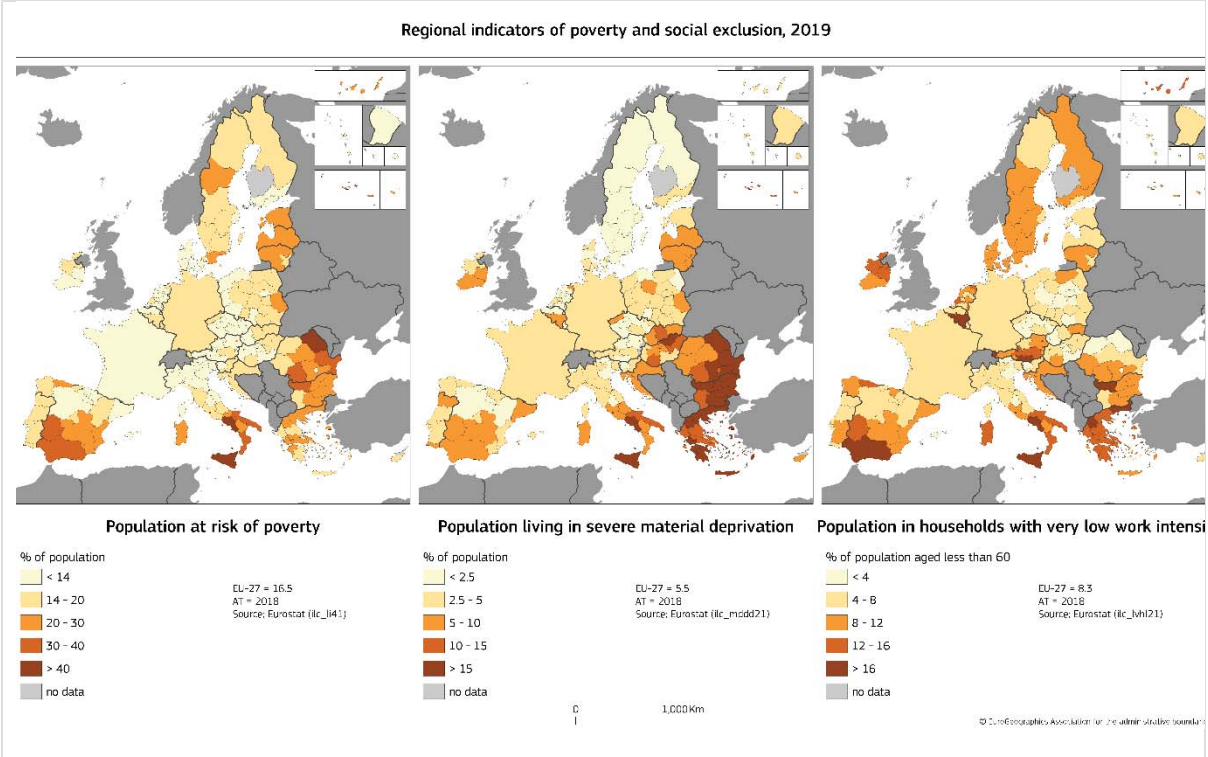
Map 5.12: Population at risk of poverty or social exclusion, 2019





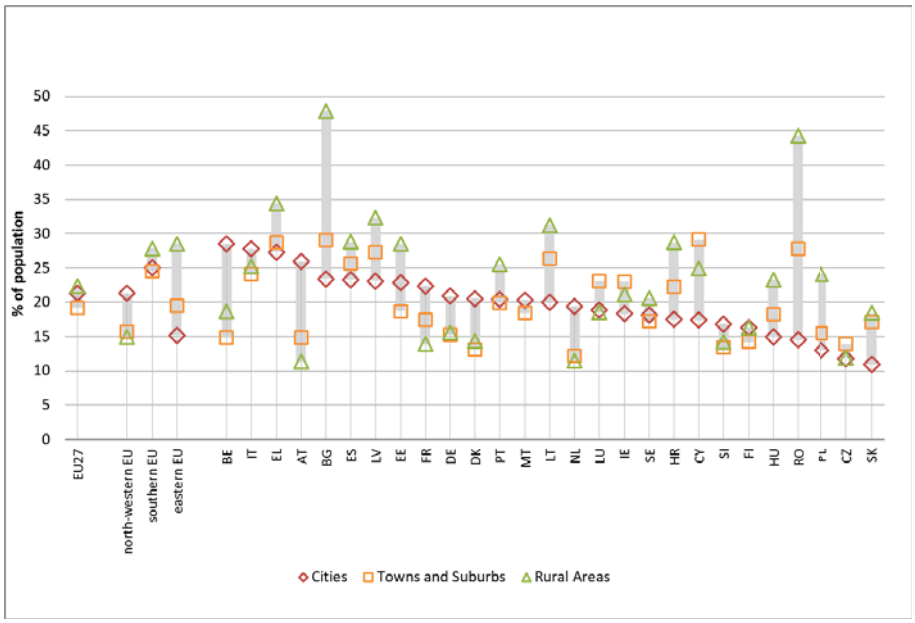
In the EU, the AROPE rate is slightly higher in rural areas (22.4% in 2019) than in cities (21.3%) and towns and suburbs (19.2%), Though it declined in all three areas between 2012 and 2019, the biggest reduction being in rural areas (Figure 5.6 and

Figure 5.7).[23]

In eastern EU, poverty and social exclusion is an issue mainly in rural areas, where, in 2019, 28.5% of people, over one in four, were at risk, well above the rate in towns and suburbs (19.5%) and cities (15.2%). In rural areas in Bulgaria and Romania, the rate is much higher, at over 40%. Between 2012 and 2019 the rate fell by almost 10 pp in cities and rural areas and by over 8 pp in towns and suburbs.

In southern EU, poverty and social exclusion is spread more evenly and remains at high level, around one in four people are at risk in all three types of area. By contrast, in north-western EU, the AROPE rate in cities (21.3% in 2019) is higher than in towns and suburbs (15.7%) and rural areas (15%).

Figure 5.6: Proportion of people at risk of poverty or social exclusion by degree of urbanisation, 2019



Source: Eurostat table [ilc_peps13], DG REGIO calculations. Member State ranked by cities' values

[23] In the period between 2012 and 2019 AROPE decreased by 3.0 pp in cites, 3.6 pp in towns and suburbs and 5.2 pp in rural areas (Source: Eurostat).

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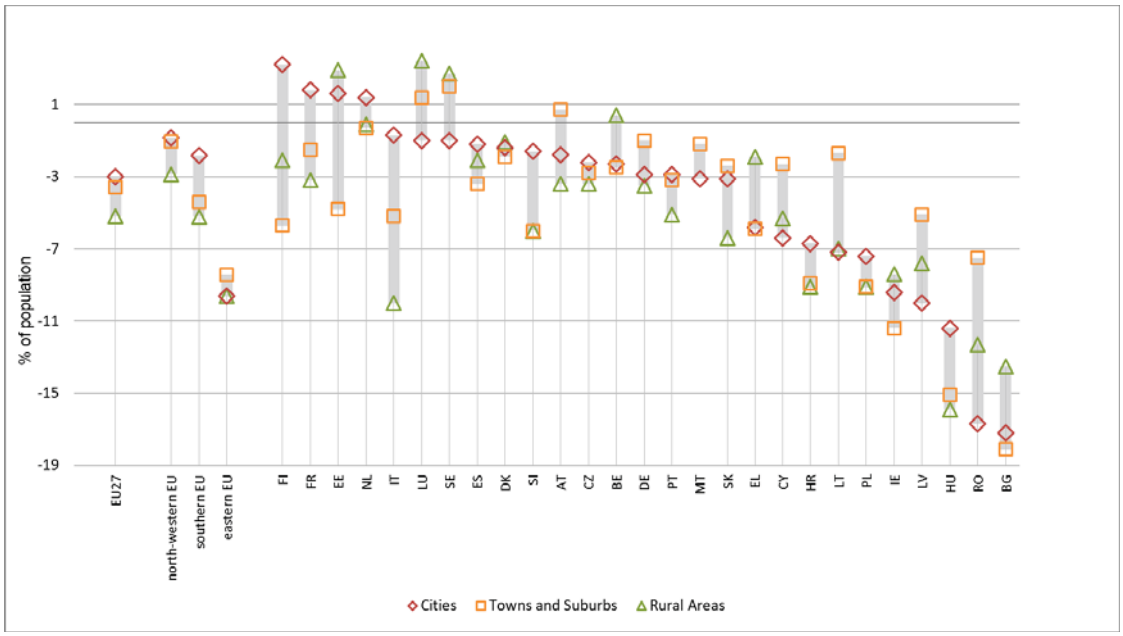
Figure 5.7: Change in the proportion of people at risk of poverty or social exclusion by degree of urbanisation, 2012-2019



Source: Eurostat table [ilc_peps13], DG REGIO calculations. Member States ranked by cities' values

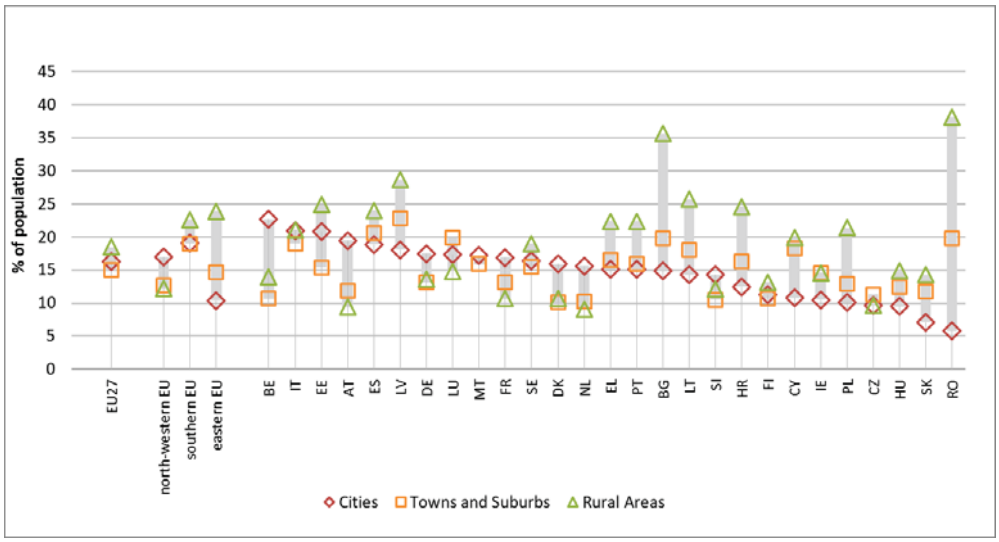
There is some difference in the incidence of the three indicators making up the AROPE measure. Across the EU, most of the people counted in the AROPE rate in 2019 - 16.5% of the population in the EU – were at-risk-of-poverty, a measure of relative monetary poverty.

A larger proportion of households are at risk of poverty in rural areas (18.5% in 2019) than in cities (16.3%) or towns and suburbs (15.0%) (Figure 5.8). At the same time, rural areas have a smaller proportion of households with very low work intensity, which suggests that their higher risk of poverty is due to lower incomes rather than lower employment rates. Between 2012 and 2019, a large number of Member States experienced an increase in the at-risk-of poverty rate among people living in cities (Figure 5.9).

In rural areas in Romania and Bulgaria, the risk of poverty is particularly high, with rates of 35% and 38%, respectively. Not surprisingly, the largest proportions of people (above 20%) reporting being unable to afford to buy food for themselves or their family members in the past 12 months are all in these regions, the proportions being largest of all in Sud-Est (37%) and Sud-Muntenia (35%) in Romania (Map 5.13).[24]

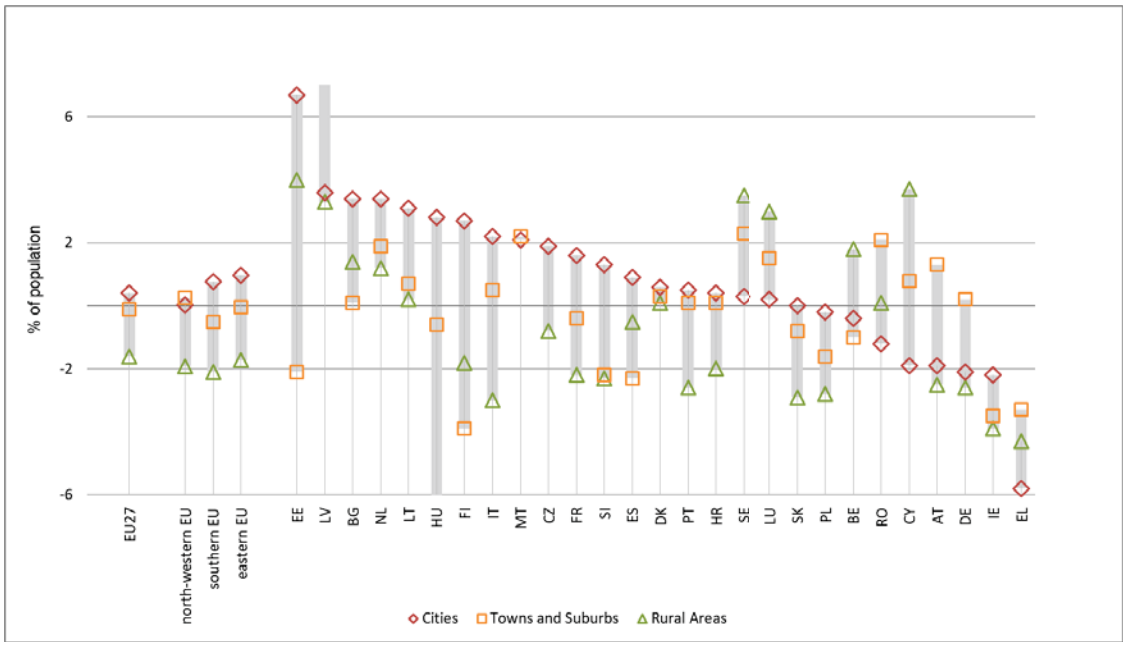
[24] Source: Gallup World Poll Survey, 2019.

Figure 5.8: The at-risk-of-poverty rate by degree of urbanisation, 2019



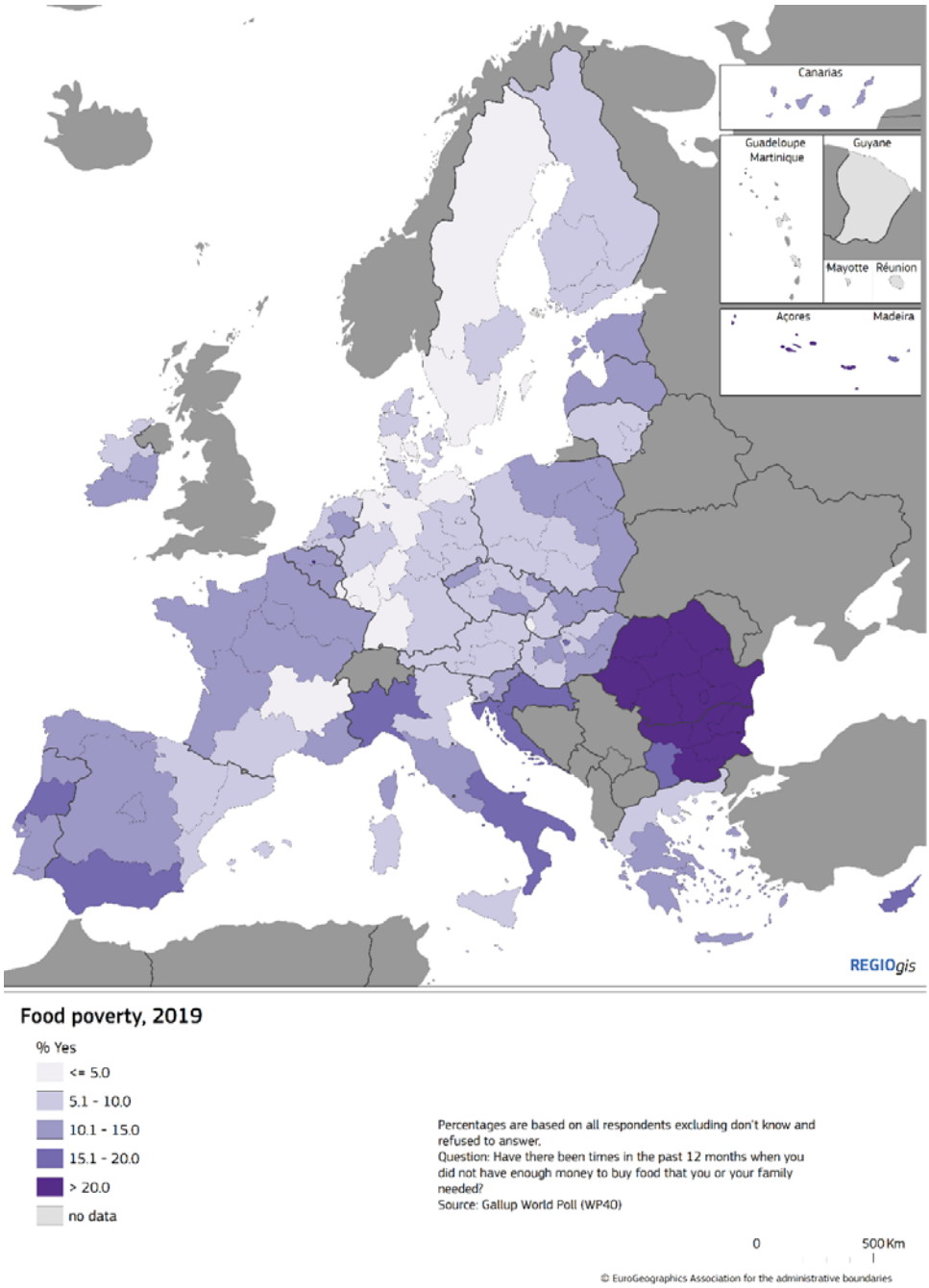
Source: Eurostat table [ilc_li43], DG REGIO calculations. Member States ranked by cities' values.

Figure 5.9: Change in the at-risk-of-poverty rate by degree of urbanisation, 2012-2019



Source: Eurostat table [ilc_li43], DG REGIO calculations. Member States ranked by cities' values

Map 5.13: Percentage of people reporting being unable to afford to buy food, 2019

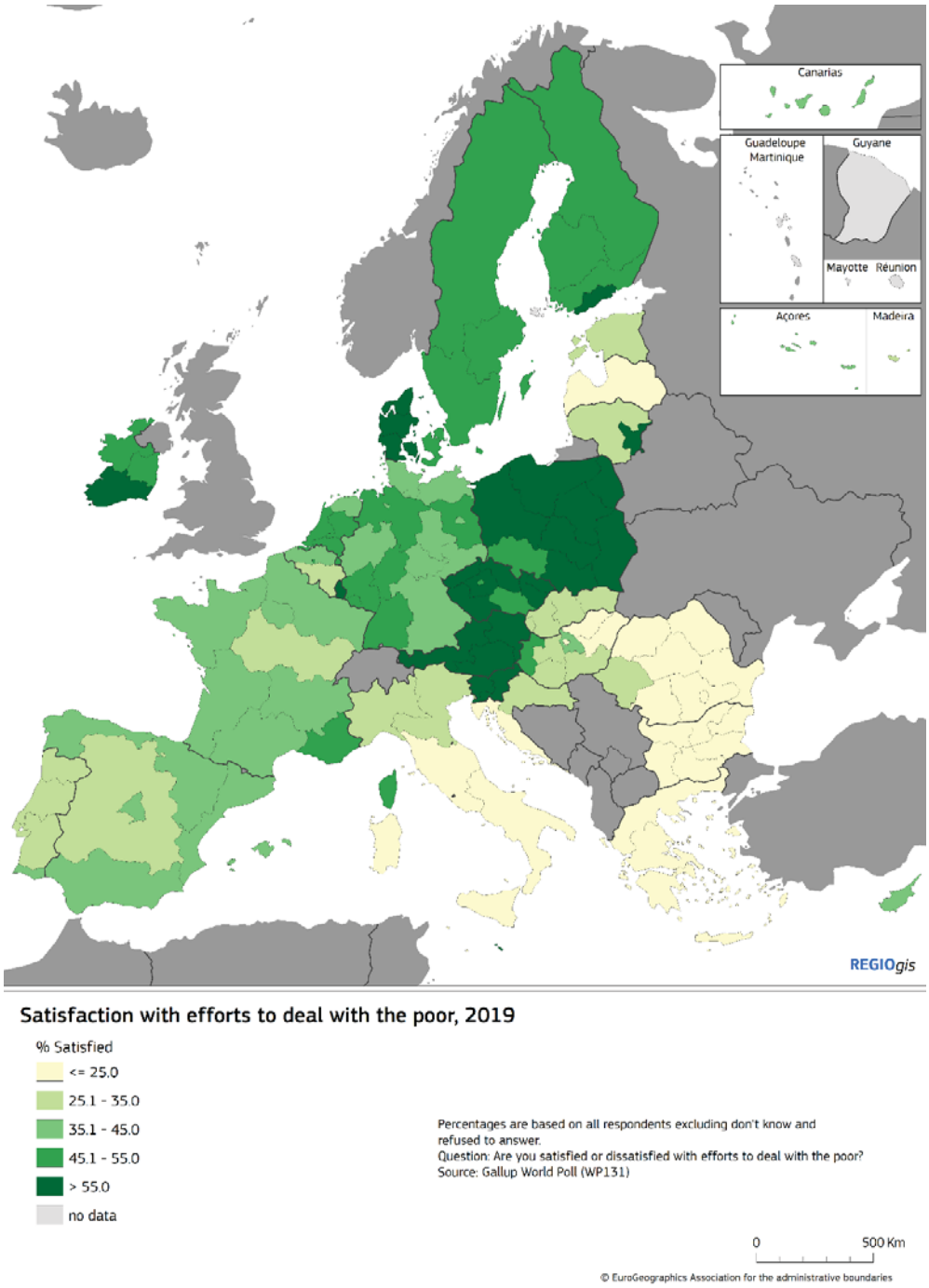


Source: Gallup World Poll Survey, DG REGIO calculations

People's satisfaction with their government's efforts to tackle poverty also varies across regions (Map 5.14), ranging from 77% being satisfied in Malta in 2019 to only 7% in Severoiztochen in Bulgaria.[25] Fewer than one person in four was satisfied with government efforts in this regard in the NUTS 1 regions of Centro and Sud in Italy, in Greece, Romania, Bulgaria, Latvia and in a number of regions in Croatia and Hungary.

[25] Source: 2019 Gallup World Poll.

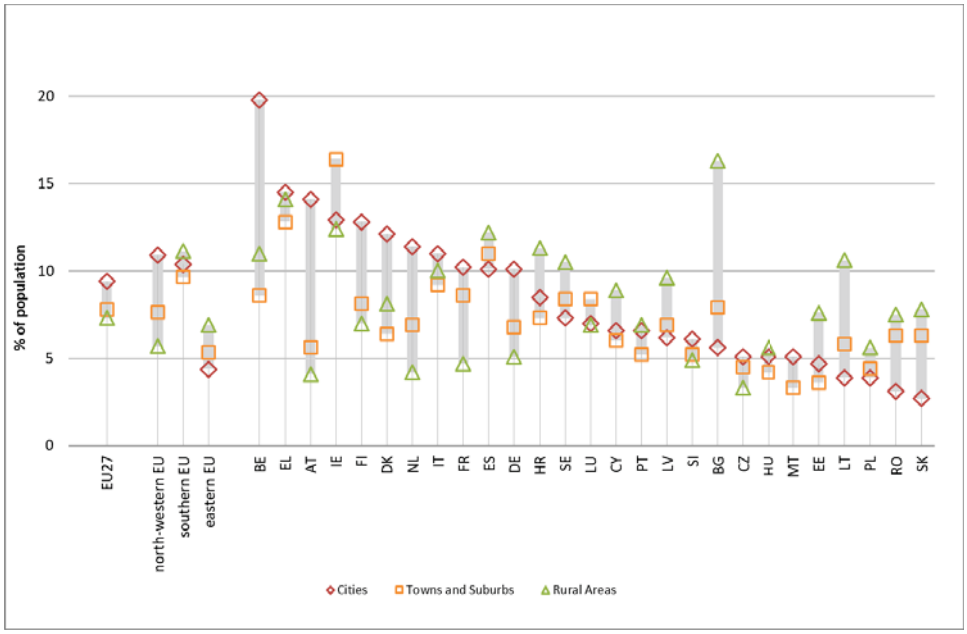
Map 5.14: Satisfaction with government efforts to deal with the poor, 2019



Source: Gallup World Poll Survey, DG REGIO calculations

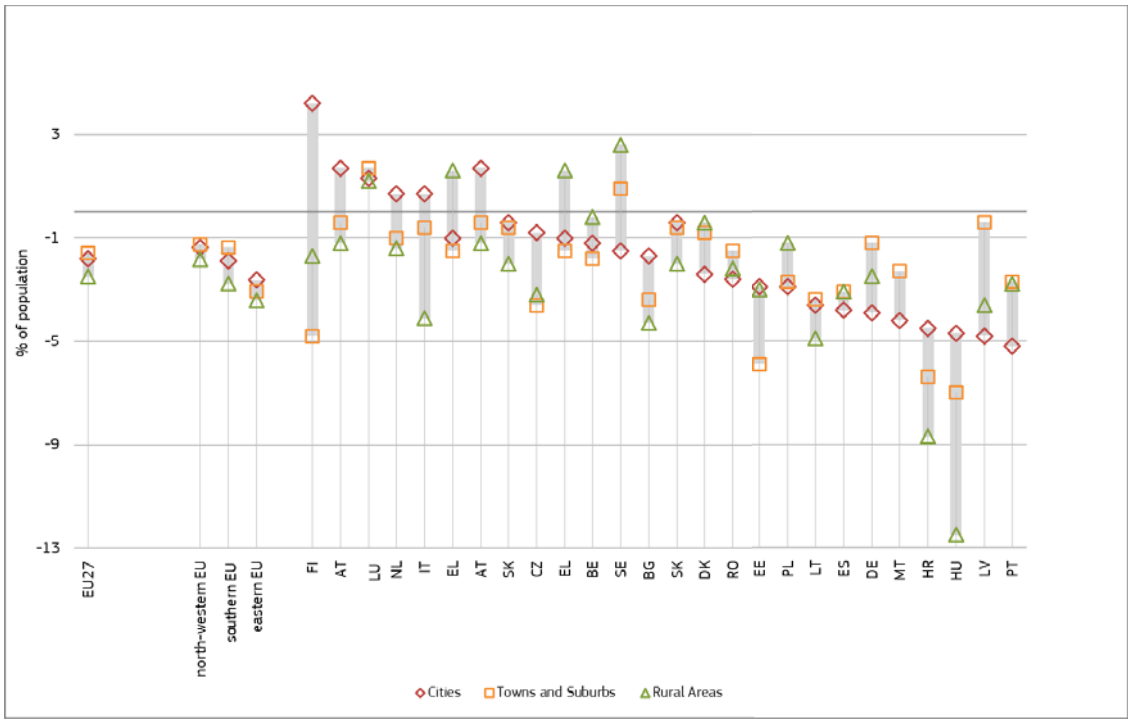
In contrast to the risk of poverty, the proportion of people living in low work intensity households in 2019 was larger in cities (9.4%) than in towns and suburbs (7.8%) and rural areas (7.3%) across the EU, a pattern largely driven by the situation in cities in the north-western (10.9%) and southern (10.4%) EU (Figure 5.10). In Belgium, one person in five (20%) in cities lived in a low work- intensity household. In rural areas, the largest proportions living in such households are in Bulgaria (16.3% in 2019). Between 2012 and 2019, however, the proportion declined in rural areas in both the southern and eastern EU (by around 3 pp).

Figure 5.10: Proportion of people living in households with very low work intensity, by degree of urbanisation, 2019



Source: Eurostat table [ilc_lvhl23], DG REGIO calculations. Member States ranked by cities' values

Figure 5.11: Change in proportion of people living in households with very low work intensity, by degree of urbanisation, 2012-2019



Source: Eurostat table [ilc_lvhl23], DG REGIO calculations. Member States ranked by cities' values

Severe material deprivation (not being able to afford any four or more of nine basic items included in the EU-SILC survey; see Box) is highest in areas in southern and eastern EU, especially in rural areas in eastern EU, where around 10% of people were severely deprived in 2019 (Figure 5.12).

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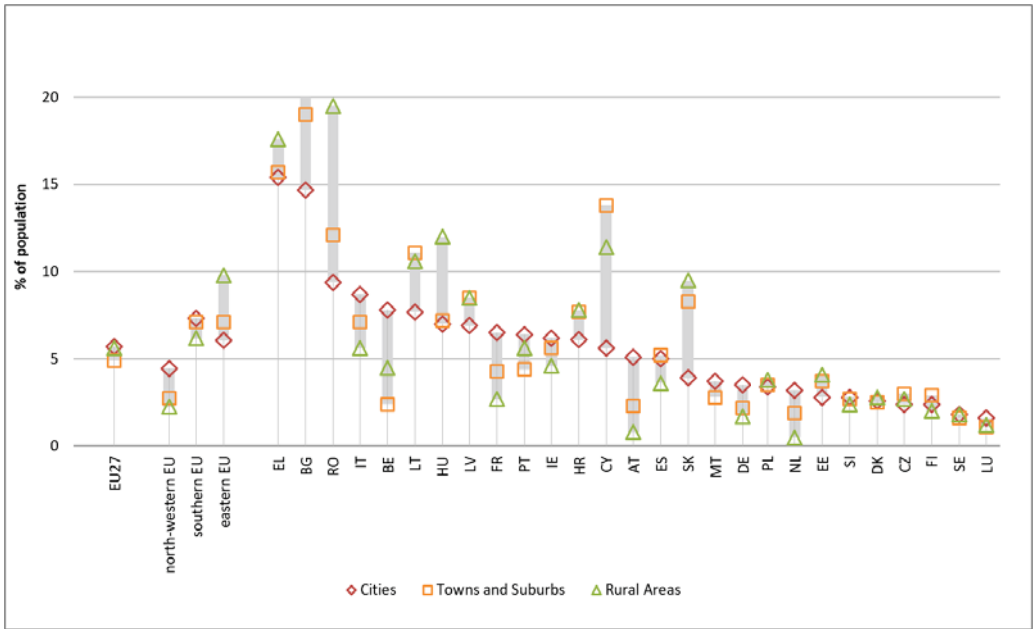
Nevertheless, in areas in eastern EU, between 2012 and 2019, the proportion fell by 13 pp in rural areas and 11 pp in cities and towns and suburbs (Figure 5.13).

In north-western EU, severe material deprivation is higher in cities than rural areas (affecting 4.5% of the population in 2019 as against 2.2% in rural areas), though the difference narrowed slightly between 2012 and 2019 (the proportion affected declining by 1.8 pp in cities and 1.1 pp in rural areas). Although many cities in north-western EU have high levels of GDP per head, many of them also have high levels of inequality, as reflected in higher at-risk-of-poverty rates, higher concentrations of deprivation and more households with low work intensity than in other areas.

Figure 5.12: People living in severe material deprivation by degree of urbanisation, 2019



Source: Eurostat table [ilc_mddd23], DG REGIO calculations. Member States ranked by cities' values

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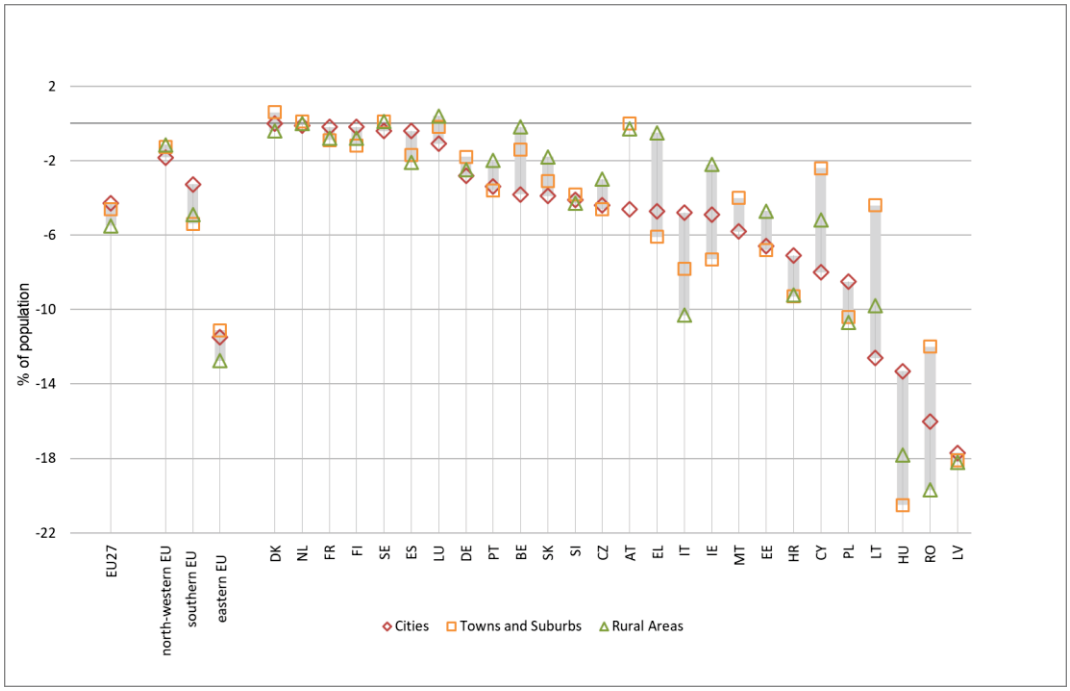
Figure 5.13: Change in proportion of people living in severe material deprivation by degree of urbanisation, 2012-2019



Source: Eurostat table [ilc_mddd23], DG REGIO calculations. Member States ranked by cities' values

The European Pillar of Social Rights and its Action Plan

The European Pillar of Social Rights was proclaimed by the European Parliament, the Council and the European Commission at the Social Summit for Fair Jobs and Growth in Gothenburg on 17 November 2017. The President-elect of the European Commission, Ursula von der Leyen**,** committed to the Pillar in her speech before the European Parliament in Strasbourg in July 2019 and in her political guidelines for the mandate of the next European Commission, announcing further action to implement the principles and rights.

The Pillar sets out a number of key principles and rights to support fair and well-functioning labour markets and welfare systems. It supports the convergence towards better working and living conditions among participating Member States. Although it is primarily conceived for the euro area, it is applicable to all Member States wishing to participate. The principles are grouped into three broad categories:

Equal opportunities and access to the labour market, which includes equal access to education and training, gender equality and active support for employment.

Fair working conditions, which includes the right to secure and adaptable employment, fair wages, information about working conditions and protection in case of dismissal, consultation with social partners, support in achieving a suitable work-life balance and a healthy and safe working environment

Social protection and inclusion, which includes the right to childcare and support for children's education, unemployment benefits and access to activation measures, minimum income support,

old-age pensions, affordable healthcare, support for people with disabilities, affordable long-term care, housing and access to essential services.

The Pillar reaffirms rights already present in the EU but complements them by taking account of new realities. As such, it does not affect principles and rights already contained in binding provisions of EU legislation. By putting together rights and principles set at different times, in different ways and in different forms, it aims to make them more visible, understandable and explicit.

On 4 March 2021, the European Commission adopted the European Pillar of Social Rights Action Plan, and proposed three headline targets for the EU to reach by 2030:

1. At least 78% of the population aged 20 to 64 to be in employment

2. At least 60% of all adults aged 25 to 64 to participate in training every year

3. A reduction of at least 15 million in the number of people at risk of poverty or social exclusion.

These targets have been welcomed by EU leaders at the Porto social summit in May 2021 and at the European Council of June 2021. Member States have been invited to set national targets on each of the indicators. Progress towards both the EU-level and national targets will be monitored through the European Semester.

The Action Plan also includes a proposal for a revised Social Scoreboard, to better track progress towards the Pillar principles in a more comprehensive manner. The yearly Joint Employment Report provides regional breakdowns (at NUTS 2 level) of the Social Scoreboard headline indicators for which such information is available.

See: https://ec.europa.eu/info/strategy/priorities-2019-2024/economy-works-people/jobs-growth-and-investment/european-pillar-social-rights_en

EUROPEAN
COMMISSION

Brussels, 4.2.2022
SWD(2022) 24 final

PART 10/16

COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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5.4 Non-EU migrants encounter more challenges on labour markets and face higher risks of poverty

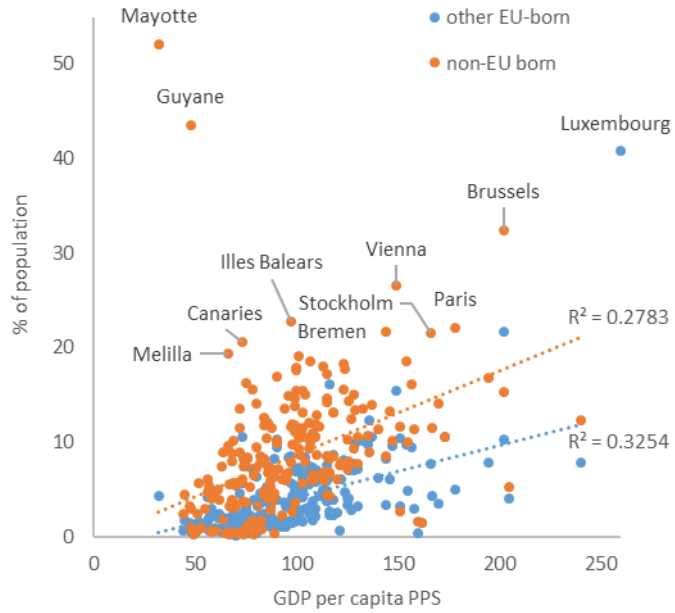
Migrants are mainly concentrated in cities in the north-western EU

Within the EU, the share of non-EU migrants (defined as the population born outside the EU) is more than double the share of EU migrants (those born in a different EU country) (9% vs 4% in 2020). Accordingly, most Member States have more non-EU born migrants than EU-born migrants (Map 5.15 and Map 5.16). Luxembourg is a clear exception, with 40% of EU-born as against 13% born outside the EU. Overall, there are few non-EU migrants in the eastern EU, except in the Baltic States, where a significant share of the population was born in Russia.

Capital city regions and regions with a large city in the north-western and southern EU tend to have larger numbers of migrants, especially from outside the EU (Map 5.16). Regions, where non-EU migrants make up 20% or more of the population, include the outermost regions of Mayotte, Guyane, Canarias, the Illes Balears and the capital city regions of Brussels, Vienna, Paris and Stockholm. The share of EU migrants is over 10% in some regions of Belgium, Germany, Luxembourg, Austria, Ireland and Finland. There are few people from other EU countries that have moved to eastern regions (Map 5.15).

The share of migrants tends to be larger in regions with high levels of GDP, good job opportunities and a history of migration (OECD 2021). The correlation between GDP per head and the share of non-EU migrants is slightly stronger than for EU-born migrants. (Figure 5.14)

Figure 5.14: Share of migrants (2020) relative to GDP per head (2019) in NUTS2 regions in the EU



Note: BG and RO: no regional data, PL not all regional data available
Source: Eurostat tables [lfst_r_lfsd2pwc] and [nama_10r_2gdp], DG REGIO calculations

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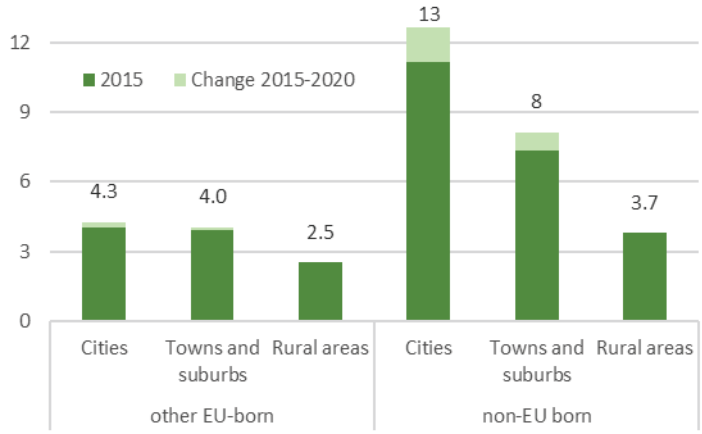
Non-EU migrants are concentrated in cities (OECD 2021), where they accounted, on average, for 13% of the population in 2020 against 8% in towns and suburbs and less than 4% in rural areas (Figure 5.15). The share also increased by more in cities between 2015 and 2020 (1.5 pp) than in towns and suburbs (0.8 pp), while it remained unchanged in rural areas.

EU migrants are far less concentrated in cities and account for approximately the same proportion of the population as in towns and suburbs (4% in 2020). They are less present in rural areas (accounting for only 2.5% of the population). Between 2015 and 2020, their share increased only in cities and then only slightly (by 0.2 pp).

Figure 5.15: EU and non-EU migrants (15-74) in the EU, by degree of urbanisation, 2015-2020 (% of the respective populations)



Note: The other-EU born and non-EU born population in Germany were estimated for 2015 based on a) the foreign population in 2015 b) the population by citizenship in Germany in 2015 and c) the population shares by country of birth in 2017 and 2018
Source: Eurostat table [lfst_r_pgauwsc], DG REGIO calculations

The employment rate of non-EU migrants increased, but more for men than for women

In the EU, the overall employment rate of people aged 20-64 increased by 3.3 pp to 72.5% from 2015 to 2020 (when because of COVID, it was slightly below the 2019 level). The rate for the native-born increased by 3.7 pp, more than for the two migrant groups (2.9 pp EU migrants and 1.6 pp for non-EU migrants). In particular, migrants living in rural areas secured a fundamental role in sustaining certain types of agricultural production in constant demand of temporary work, while in cities, they successfully fill the demand in certain services (Natale et al. 2019). The gap between the native-born and the non-EU born had been narrowing, supported by EU policies.

[26] It widened only in 2020, suggesting that the employment of the migrants was hit more by the pandemic and the measures put in place to control it (Figure 5.16).

EU migrants have a similar employment rate as native-born people (Figure 5.17). The majority of EU migrants hold EU citizenship, so have the same residency and labour market rights as native-born[27].

[26] The EU policies on legal migration include labour migration (with special directives for highly qualified workers subject to 'EU Blue Card Directive', seasonal workers and intercorporate transferees) as well as students and researchers, family reunification and long-term residents.

[27] Free movement of workers is one of the four freedoms enjoyed by EU citizens. It is guaranteed by the Article 45 of the Treaty on the Functioning of the European Union.

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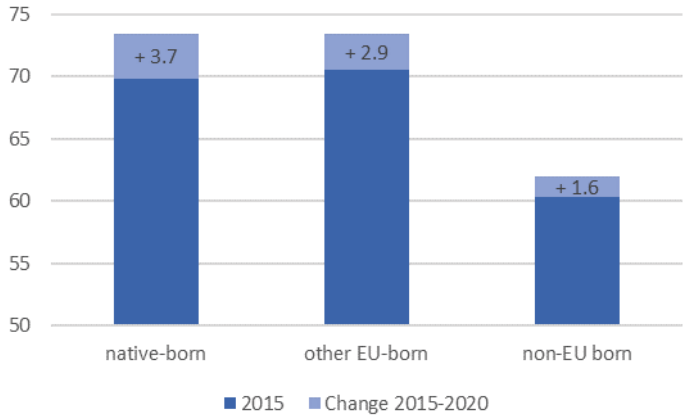
Accordingly, they are free to move to regions with higher wages and more employment opportunities and tend to face fewer obstacles to relocating than non-EU migrants if they lose their job. [28]

Non-EU migrants, despite progress, have a substantially lower employment rate than the native-born (62% as against 74%), mainly because of a low rate for women (53%). In Sweden and Belgium, the overall gap in the rate was 20 pp in 2020; for women, it was almost double the rate for men (28 pp as against 15 pp).

In most cases, the employment rate of non-EU migrants is higher in regions with a high native-born employment rate (OECD, 2021), but this is also where the gap with the native-born tends to be widest, especially for women (Map 5.17). The gap, therefore, averages 15 pp in north-western EU compared with only 5 pp in southern EU and 2 pp in the eastern EU (Figure 5.18). There is little difference in the employment rates of the three groups between cities and rural areas.

In the EU, the overall gender gap in the employment rate remained unchanged from 2015 to 2019 and narrowed slightly in 2020, when the rate for men was 78% and that for women 67% (see section 5.5). Conversely, the COVID-19 pandemic halted the increase in the employment rate for non-EU migrant women, and the gender gap for non-EU migrants widened by 3 pp to 20 pp as against 11 pp for native-born (Figure 5.17).

Figure 5.16: Employment rates (20-64) in the EU, for native-born and migrants, 2020 (% of the respective population, figure for change 2015-2020 in pp)



Source: Eurostat table [lfst_r_pgauwsc], DG REGIO calculations

[28] See EC (2021a) for annual information on intra-EU labour mobility.

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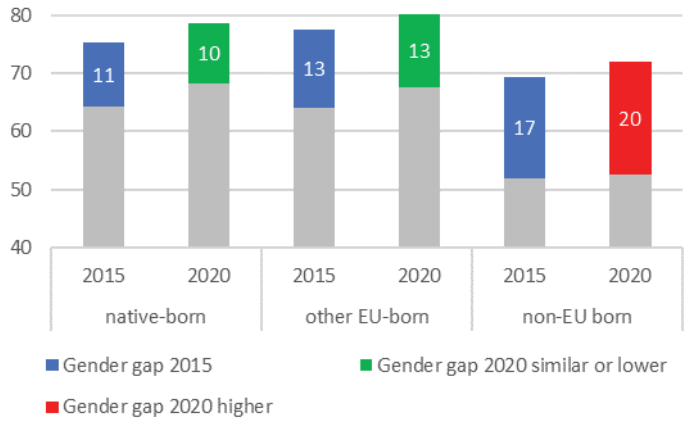
Figure 5.17: Employment rates (20-64) and gender employment gaps (pp) in the EU, for native-born and migrants, 2015 and 2020 (% of the respective population)



Note: Grey bar parts are for employment rates for females, bar tops are for employment rates for males
Source: Eurostat table [lfst_r_pgauwsc], DG REGIO calculations

Non-EU migrants with tertiary education have the widest employment gap, while the tertiary education attainment level is 4 pp lower

For people with basic education, the employment rate of non-EU migrants is just 2 pp lower than for the native-born. The gap between the two widens to 8 pp for those with upper secondary education and to 15 pp for those with tertiary education. This is primarily due to a substantial gap for women (19 pp), as well as more generally perhaps to difficulties in getting foreign qualifications recognised (Figure 5.18).

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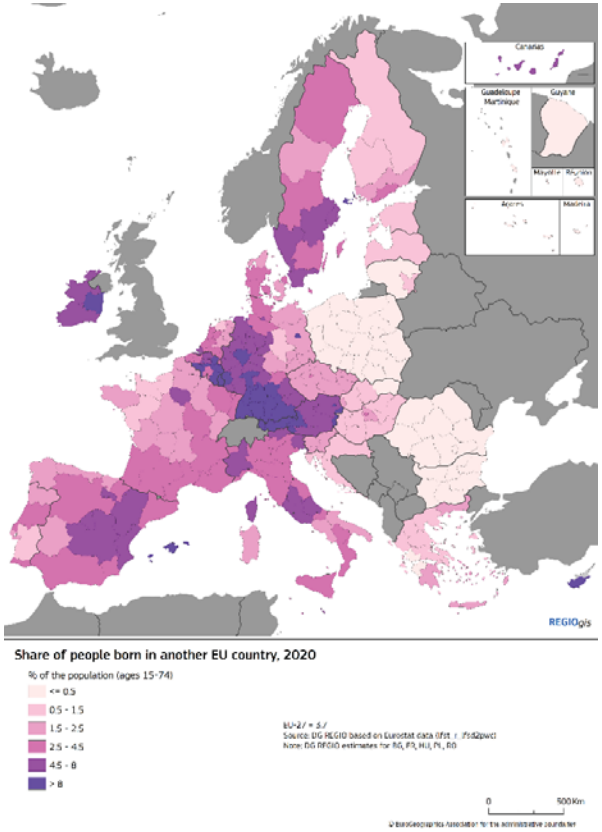
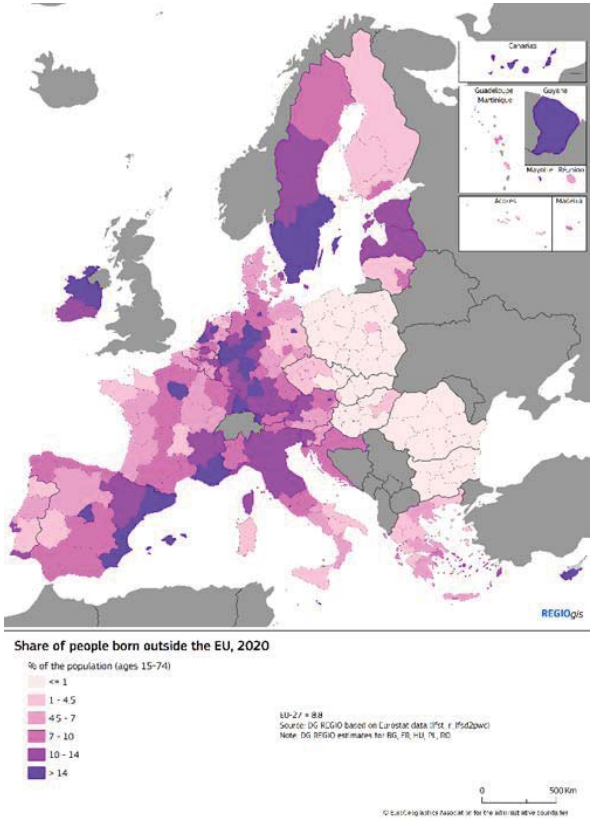
Map 5.15: People born in another EU country, 2020



Map 5.16: People born outside the EU, 2020



Map 5.17: Difference between employment rates of non-EU born and native-born, 2020

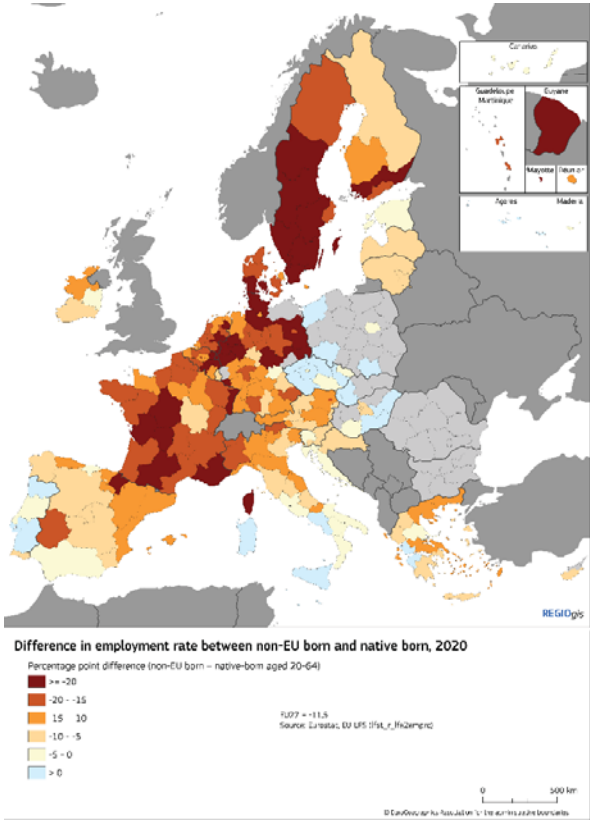
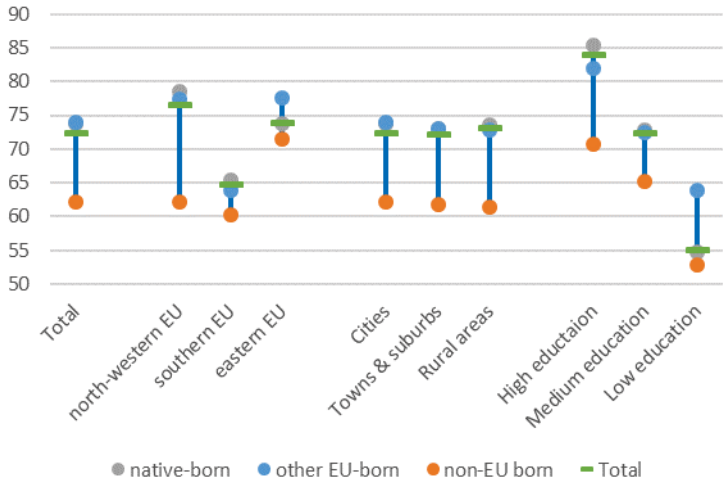


Figure 5.18: Employment rates (20-64) for native-born, EU born migrants and non-EU born migrants in the EU, 2020 (% of the respective populations)

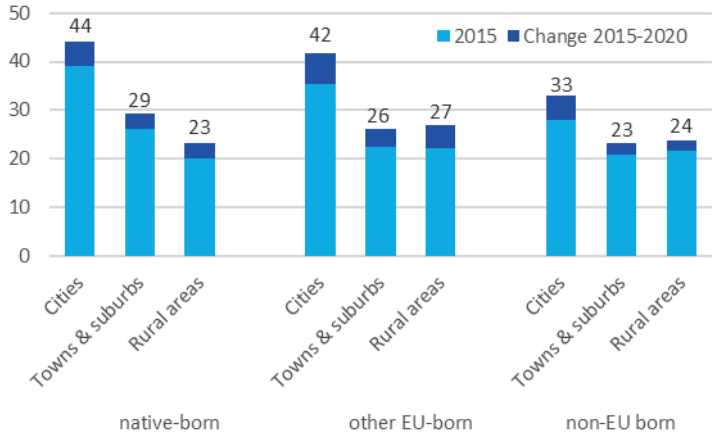


Source: Eurostat table [lfst_r_eredcobu], DG REGIO calculations

A third (33%) of native-born and EU migrants aged 25-64 have tertiary education compared with 29% of non-EU migrants. For all three groups, the tertiary-educated tend to be concentrated in cities. This is especially so for native-born, for whom the proportion of tertiary-educated is almost double in cities than in rural areas (44% against 23%). For EU migrants, the difference is smaller (42% against 27%), and for non-EU migrants smaller still (33% vs 24%) (Figure 5.19)

Migrants aged 15-24 are more likely to be neither in employment nor in education or training than native-born (20% as against 10%).

Figure 5.19: Native-born and migrants aged 25-64 with tertiary education by degree of urbanisation, 2020 (% of the respective populations)



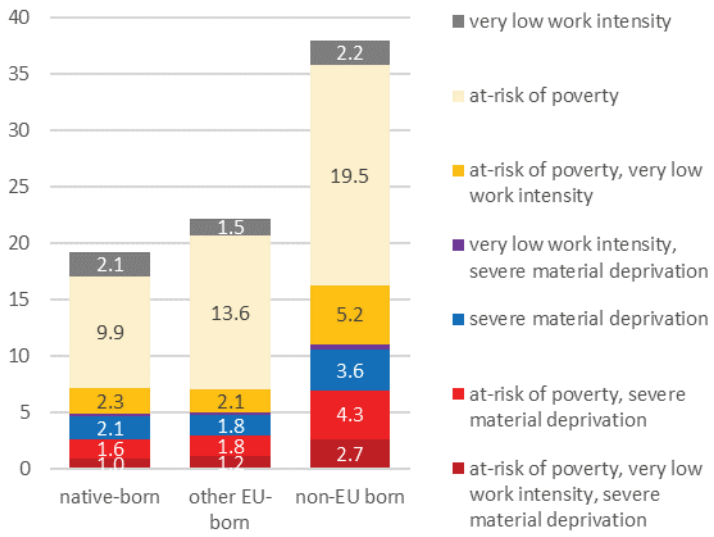
Source: Eurostat table [edat_lfs_9915], DG REGIO calculations

Non-EU migrants have double the risk of poverty and social exclusion

In 2019, around 10 million migrants aged 15 and over were at risk of poverty or social exclusion (AROPE). This consists of 2 million EU migrants (22% of their total number) and 8.5 million non-EU migrants (38% of their number). The proportion is 3 pp smaller than in 2015 for both groups. Economic and labour market improvements led to a fall in the proportion of people living in very low work-intensity households, while there was an even larger reduction in those suffering severe material deprivation, especially among non-EU migrants. The fact that there was only a small reduction in those at risk of poverty, however, indicates that many non-EU migrants still have very low incomes.

Indeed, the AROPE rate for non-EU migrants is double that of native-born. The proportion of non-EU migrants at risk of poverty and simultaneously in a situation of severe material deprivation and in a household with very low work-intensity is almost three times that of the native-born (2.7% as against 1%) (Figure 5.20).

Figure 5.20: Intersection between sub-populations of AROPE in the EU for native-born and migrants, 2019 (% of the respective populations)



Source: Eurostat table [ilc_pees07], DG REGIO calculations

The AROPE rate for the population as a whole varies only slightly between cities (21.3% in 2019), towns and suburbs (19.2%) and rural areas (22.4%). However, the high concentration of migrants in cities – 45% of other-EU born and nearly 60% of non-EU born live in cities compared to less than 40% of the native born – means that the number of migrants at-risk-of-poverty-or-social-exclusion may be higher in cities than in rural areas. This is especially the case in Belgium and Austria (Figure 5.21).

Figure 5.21: Difference in shares of migrants and difference in the AROPE rate between cities and rural areas in the EU, 2019

Note: The horizontal axis show the percentage point difference in AROPE between cities and rural areas. The vertical axis shows the percentage point difference in the share of migrants in total population between cities and rural areas.
Source: Eurostat tables [ilc_peps13] and [lfst_r_pgauwsc], DG REGIO calculations

Material and social deprivation (see definition in the note to Figure 5.22) has fallen since 2015 across the EU. However, it is more prevalent among non-EU migrants than other groups, affecting roughly twice the share of these as native- and EU-born (Figure 5.22). This is especially the case in rural areas (26% in 2019) as compared with cities (24%) and towns and suburbs (22%).

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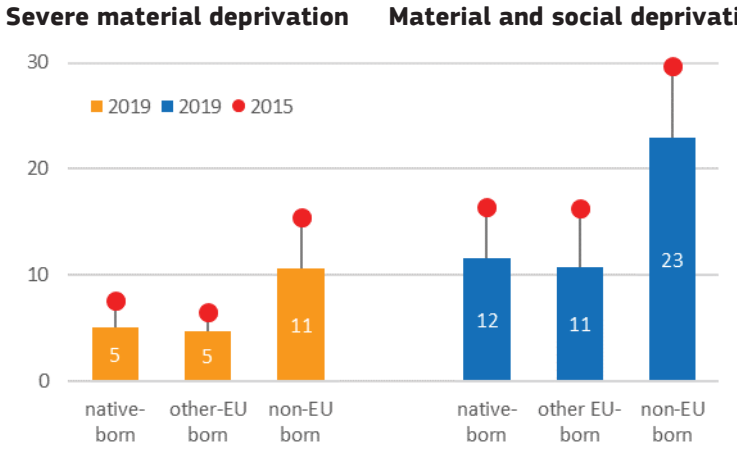
Figure 5.22: Deprivation rates (18+) in the EU for native-born and migrants, 2015 and 2019 (% of the respective populations)



Source: Eurostat tables [ilc_mddd16] and [ilc_mdsd05], DG REGIO calculations

Severe material deprivation : for at least four items out of the following, could not afford:
- to pay their rent, mortgage or utility bills;
- to keep their home adequately warm;
- to face unexpected expenses;
- to eat meat or proteins regularly;
- to go on holiday;
- a television set;
- a washing machine;
- a car;
- a telephone;

Material and social deprivation : for at least five items out of the following was unable for financial reasons to:
- face unexpected expenses;
- afford one week's annual holiday away from home;
- avoid arrears (in mortgage, rent, utility bills and/or hire purchase instalments);
- afford a meal with meat, chicken or fish or vegetarian equivalent every second day;
- keep their home adequately warm;
- afford a car/van for personal use;
- replace worn-out furniture;
- replace worn-out clothes with some new ones;
- have two pairs of properly fitting shoes;
- spend a small amount of money each week on him/herself ("pocket money");
- have regular leisure activities;
- get together with friends/family for a drink/meal at least once a month;
- have an internet connection;

Migration and regional economic development

A forthcoming OECD report (OECD 2022) assesses the uneven impact of migration on regions and cities. One of its chapters analyses the impact of migration on regional development through innovation, international trade, labour markets and overall economic growth.

Migrants tend to increase regional GDP per head and contribute to regional economic convergence within and across countries in Europe. Migrants can increase regional GDP per head because they are younger and often bring complementary skills and fill shortages in critical positions. The study finds that, on average, a 10% increase in the migrant population share is associated with 0.15% higher GDP per head. This effect is stronger for less developed regions, especially in lower-income EU Member States. Overall, for the 25% poorest regions in a country, the positive effect of migration on per GDP per head is more than twice as high (0.36%). As a result, migration can help less developed regions catch up with the rest of the country and rest of the EU.

Migrants contribute to innovation by bringing new ideas to their host regions in OECD countries. Using detailed information on patents and the share of migrants in municipalities, the study shows that migrants raise the patenting activity in their local area and boost local innovation. However, these positive effects are limited to areas that were already innovative with high patenting levels, mainly located in urban areas.

The presence of migrants influences regions' international trade. In Europe, migrants help their host regions establish new trade networks, reduce information costs, create demand for goods from origin countries and boost regional exports and imports. On average, a 10% increase in the number of migrants in a given European region leads to 3.2% higher imports, including intermediates used in exports, and a 1.2% increase in exports. This impact is higher for regions with more high-skilled migrants, and most relevant for extra-EU trade.

The labour market response to migrants varies across European regions and by type of worker. An increase in the share of migrants is linked to a short-term slowdown of growth in the native employment rate, especially among low-skilled workers. This effect weakens or disappears over time as regional labour markets adapt. In regions with higher levels of GDP per head, migrants are more easily absorbed in the labour force, resulting in little or no effect on the native workforce.

The report concludes that targeted policies could help to spread the benefits of migration for regional development. For instance, investing in the upskilling of native

workers, especially those without a tertiary education, and less developed regions, could help address labour market challenges and strengthen regional development.

5.5 Where women thrive in the EU

Gender equality is one of the fundamental values of the EU and features prominently in the European Pillar of Social Rights. One of the UN Sustainable Development Goals (SDG) is to achieve gender equality and empower all women and girls by 2030 (SDG5), while the recently adopted EU Gender Equality Strategy 2020-2025 is intended to ensure that all EU policy areas contribute to gender equality.

In some EU regions, women are able to improve their economic, social, and political positions, while in others they are held back. Despite the strong political commitment to achieving gender equality in the EU, large differences between women and men remain in various aspects of life, such as access to the labour market, pay and working conditions, and leadership in decision making.[4]

Gender Equality Strategy 2020-2025

The Gender Equality Strategy covers the European Commission's work on gender equ and sets out the policy objectives and main points of action for the 2020-2025 period.

The **key objectives** are ending gender-based violence; challenging gender stereoty closing gender gaps in the labour market; achieving equal participation across diffe sectors of the economy; addressing the gender pay and pension gaps; closing the ge care gap and achieving gender balance in decision-making and in politics.

The **implementation** of this strategy is based on a **dual approach** of targeting meas to achieve gender equality, and strengthening gender mainstreaming. The latter wil pursued by **systematically including a gender perspective at all stages of po design in all EU policy areas, internal and external**.

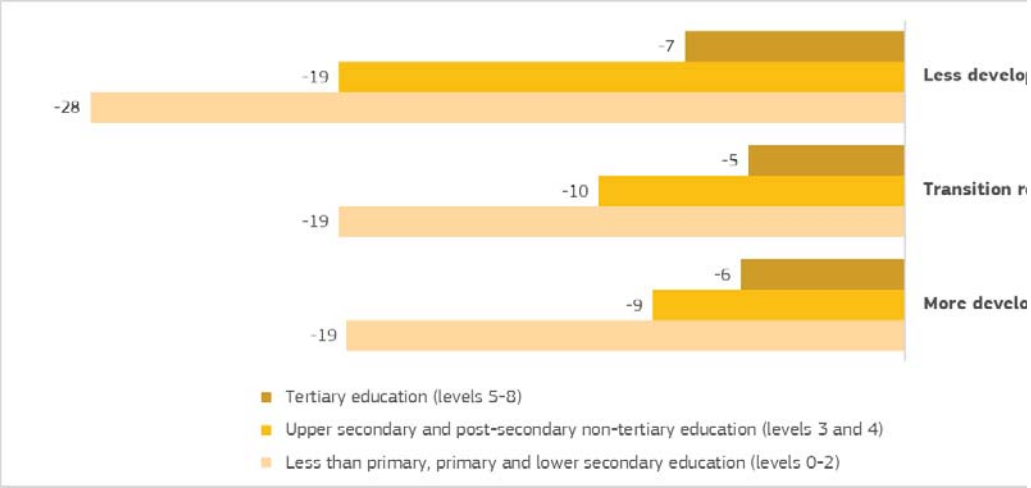
For more details:
https://ec.europa.eu/info/policies/justice-and-fundamental-rights/gender-equality/gender-equality strategy_en

In 2020, the employment rate of men (aged 20-64) in the EU was around 11 pp higher than for women (78% as against 67%) and the gap has remained unchanged over recent years (at least since the recovery started in 2013). The gender gap is particularly wide in less developed regions (17 pp in 2020) and in regions in southern and eastern EU (15 pp in both) (Table 5.4). Employment rates for men are higher than for women in all regions, except the capital city region in Lithuania, but with marked differences between them (Map 5.18). The gap was over 20 pp in 2020 in Malta, Corse, in several regions in Greece and Romania and in southern Italy. The gender gap in the employment rate is wider the lower the

[4] The European Pillar of Social Rights calls, in principle 2, for equality of treatment and opportunity between women and men in the labour market, terms and conditions of employment, and career progression and for the right to equal pay.

level of education and is widest in less developed regions for all education levels (Figure 5.23).

Figure 5.23: Gender gap in employment rate, by level of education and group of regions 2020 (%-point difference between male and female rate)



Source: Eurostat table [lfst_r_lfe2emprc], DG REGIO calculations

Gender dimension in the Multiannaul Financial Framework 2021-27

The newly adopted Multi-Annual Financial Framework (MFF) for the years 2021-27 incl a gender dimension throughout and more specifically in various EU funding and budge guarantee instruments, particularly **ESF Plus**, the **ERDF**, **Creative Europe**, the **Europ Maritime and Fisheries Fund**, the **Cohesion Fund** and the **InvestEU Program** Funding will support women's labour market participation and work-life balance, inve care facilities, support female entrepreneurship, combat gender segregation in ce professions and address the unbalanced representation of girls and boys in part education and training.

For more details on the 2021-27 MFF:
https://ec.europa.eu/info/strategy/eu-budget/long-term-eu-budget_en

The far lower employment rates of women, however, do not translate into higher unemployment rates (Map 5.19), because many more women than men are not actively looking for a job[5] *"It is often missing care facilities for children and dependent elderly and gender stereotypes that hamper women's participation in the labour market and in entrepreneurship"* (European Commission, 2021b, page 19). At the EU level, women's unemployment rates were only 0.5 pp higher than for men in 2020, though the gap was wider in less developed regions (1.5 pp) than in transition ones (0.5 pp), with the rate for women being higher than for men in southern EU regions especially (3 pp higher). Only in regions in north-western EU was the rate lower for women than for men (Table 5.4).

[5] In 2020, in the EU, the activity rate for women - at 72% of the total population aged 20-64 - was around 12 pp lower than for men.

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Table 5.4: Difference between female and male employment and unemployment rates in 2020 by group of regions

	More developed regions	Transition regions	Less developed regions	EU
Gender gap (F-M) in employment rates (20-64), pp	-9.0	-9.1	-17.2	-
Gender gap (F-M) in unemployment rates (15-74), pp,	0.0	0.5	1.5	0.5
	north-western EU	**southern EU**	**eastern EU**	**EU**
Gender gap (F-M) in employment rates (20-64), pp	-7.0	-15.4	-14.6	-11
Gender gap (F-M) in unemployment rates (15-74), pp	-0.5	2.8	0.0	0.5

Source: Eurostat table [lfst_r_lfe2emprt] and [lfst_r_lfu3rt], DG REGIO calculations

Women in the EU have higher education levels than men

In the EU, more women aged 25-64 have tertiary education than men and this is the case in all regions, except in several regions in Germany, Austria, and southern regions in the Netherlands. On average, 35% of women in this age group were university graduates in 2018-2020, as opposed to 30% of men. The gap tends to be smaller in more developed regions and in regions in north-western EU (Table 5.5). In Estonia, Latvia and Finland, the share of women with tertiary education was 16 pp - or more - larger than for men

Table 5.5: Gender gap in tertiary education by group of regions, average 2018-20

	More developed regions	Transition regions	Less developed regions	
Difference in the share of women and men aged 25-64 with tertiary education (percentage points)	1.8	6.5	7.4	
	north-western EU	**southern EU**	**eastern EU**	
Difference in the share of women and men aged 25-64 with tertiary education (percentage points)	1.7	5.7	8.8	

Source: Eurostat table [edat_lfse_04], DG REGIO calculations

Women in political power

In 2003, the Council of the EU recommended balanced participation of women and men in all decision-making bodies in political and public life, with the proportion of women not falling below 40%.[6] In addition, the UN Sustainable Development Agenda calls for full and effective participation and equal opportunities for leadership for women at all levels of political and economic

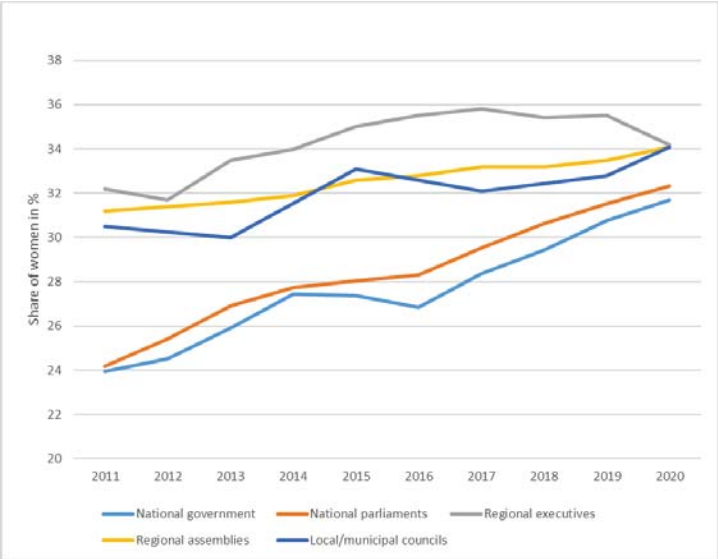
[6] Council of Europe, *Recommendation Rec(2003)3 of the Committee of Ministers to member states on balanced participation of women and men in political and public decision making*, 2003, available at: https://search.coe.int/cm/Pages/result_details.aspx?ObjectID=09000016805e0848.

decision-making (SDG5). To date, progress is still slow and wide differences exist throughout the EU.

In 2020, only one in three members of national governments and parliaments, regional assemblies and executives and local councils were women (Figure 5.24). While the share of women was 8 pp higher than in 2011 in national governments and parliaments, the increase in share in regional executives (2 pp higher) and assemblies (3 pp higher), and local councils (just under 4 pp higher) was considerably less. At this rate, the share of women in national governments and parliaments would reach 50% by 2040, in local councils only in 2060, in regional assemblies in 2070 and in regional executives in 2090.

Part of the reason for the relatively slow progress at regional and local level may be that they started from a significantly larger share of women at the beginning of the period than in national governments and parliaments. Regions with small shares of women in regional assemblies in 2010[7], therefore, experienced the largest increases in the subsequent 11 years (Map 5.21).

Figure 5.24 Women and political power in the EU, 2011-2020

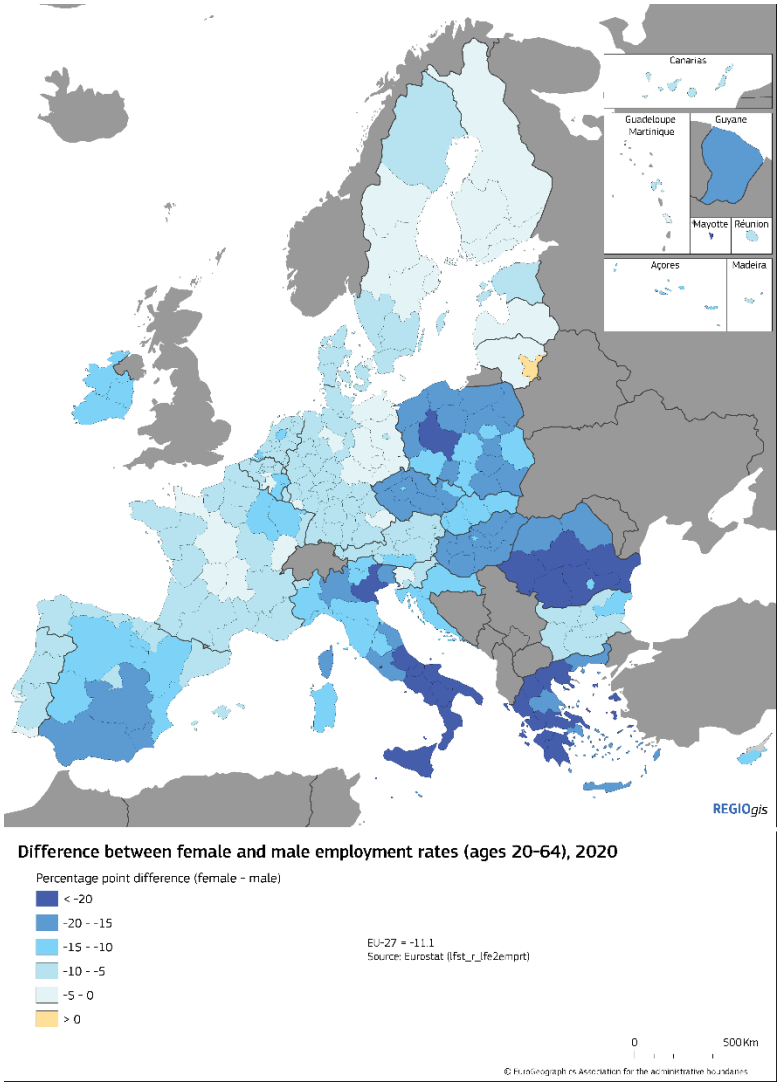


Source: European Institute for Gender Equality (EIGE), DG REGIO calculations

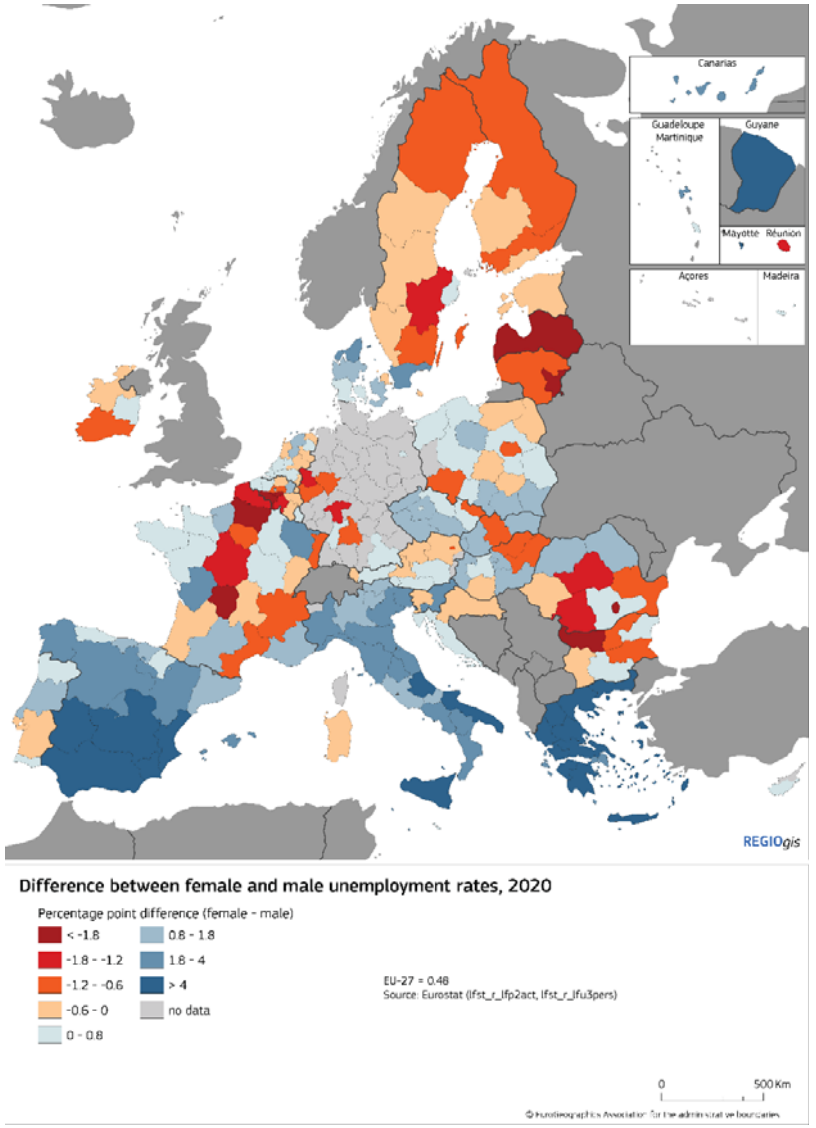
In 2021, women made up at least half of regional assemblies in only 16 out of 285 cases. Two regional assemblies in Hungary have no women members at all, and in several regional assemblies in Hungary and Romania less than 10% of members are women. The share of women is largest (40% or more) in regional assemblies in Spain, France, Sweden and Finland (Map 5.20). Worryingly, in some EU regions, mainly located in eastern EU, not only was the share of women small in 2010, it also diminished further in the 11 years to 2021 (Map 5.21)

[7] Data for regional assemblies are available for the years 2010 to 2021.

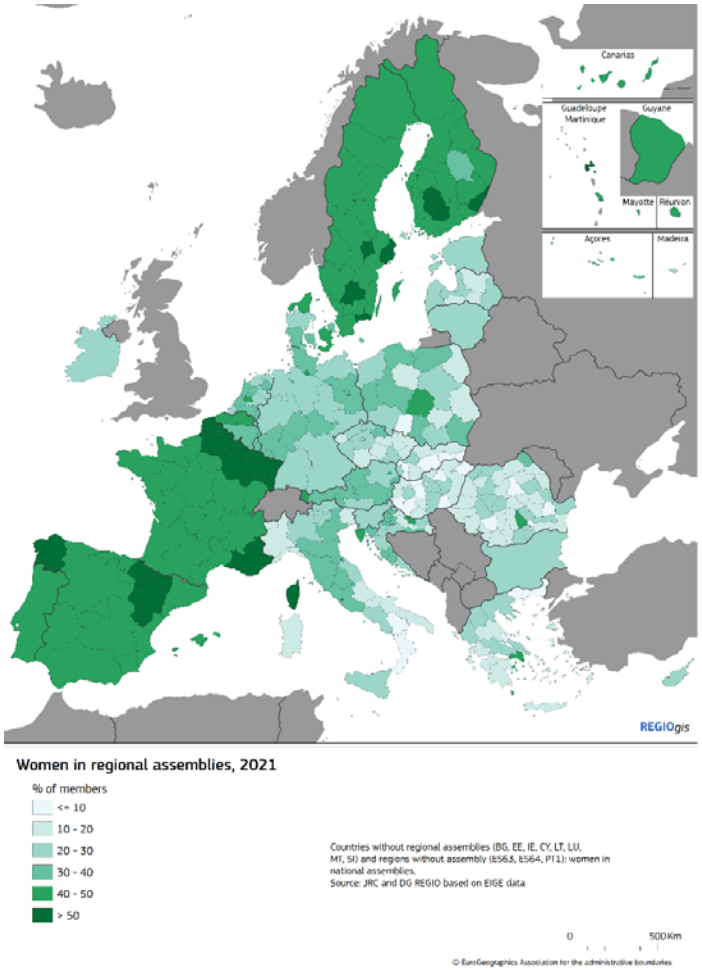
Map 5.18: Difference between female and male employment rates (20-64), 2020



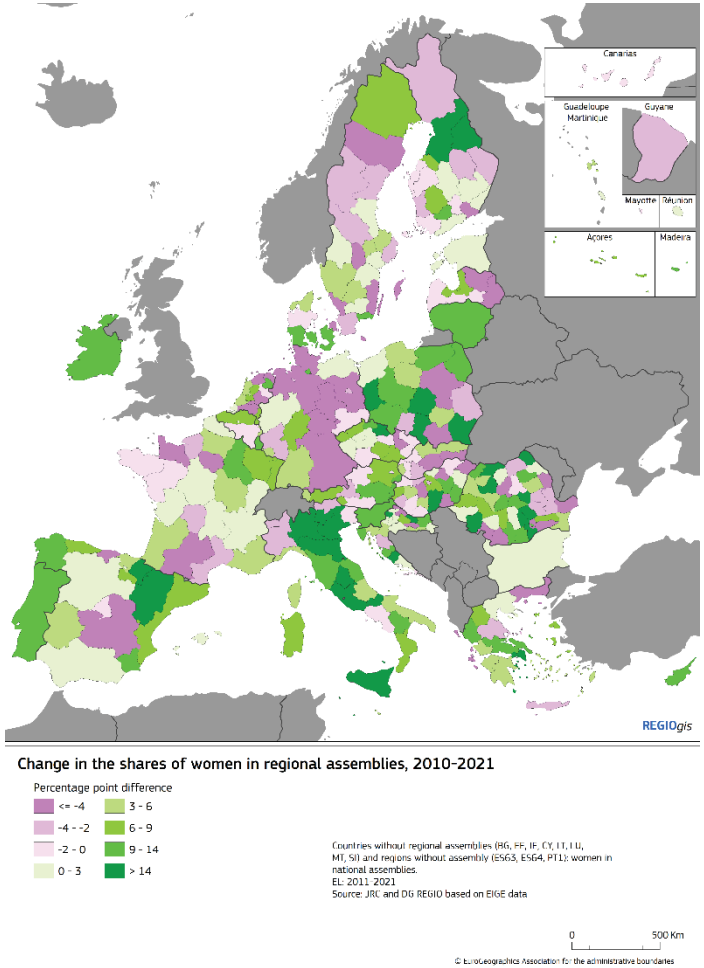
Map 5.19: Difference between female and male unemployment rates (15-74), 2020



Map 5.20: Women in regional assemblies, 2021



Map 5.21: Change in the share of women in regional assemblies, 2010-2021



Women's life satisfaction and views about job opportunities and their personal safety

When asked about whether they are satisfied with their life, around 33% of women in the EU in 2019 reported being satisfied, against 35% of men, though this small difference in the average hides large differences in many Member States and regions (Map 5.22). Less than 20% of women were satisfied with their life in all regions in Bulgaria and Croatia and a number of regions in Greece and Italy. Indeed, the figure was below 10% in Severoiztochen (6%) and Severen tsentralen (7%) in Bulgaria and Kontinentalna Hrvatska (9%) in Croatia (though in these regions, the figure was also below 10% for men). By contrast, the proportion was over 70% in all regions in Finland, where in Helsinki-Uusimaa and LänsiSuom, a much larger share of women than men (13 pp more) reported being satisfied with their life. On the other hand, the reverse is the case in Sachsen-Anhalt in Germany (the share being 25pp less for women than for men) and in north-east Italy (6pp less) (Map 5.23).

When asked about job opportunities, 51% of men across EU regions believed that, in 2019, it was a good time for finding a job in the area where they live - i.e. that there were significant job opportunities open to them – as against only 40% of women. There were, however, wide differences across regions (Map 5.24). While only 10% of women had a positive opinion on job opportunities in their area in the NUTS 1 region of Italy including Sicily and Sardinia, almost 90% of women had a positive opinion in Praha in Czechia. The gap between men and women was widest in the Região Autónoma da Madeira in Portugal (5% for men against 24% for women), followed by Saarland (67% for men, 44% for women), and Rheinland-Pfalz (78% for men, 55% for women) in Germany. By contrast, in Helsinki-Uusimaa in Finland and Bremen in Germany, more women than men had a positive opinion of job opportunities. More women than men also had a positive opinion in Lithuania, though here the overall satisfaction level was low (28% for women, 22% for men) (Map 5.25).

People who feel safe and trust others also tend to be more satisfied with their life. Those who have experienced crime, or have a fear of crime, tend to engage less in outdoor activities and to report higher levels of distress and lower levels of well-being (Hanslmaier, 2013; Brereton et al., 2008; Denkers and Winkel, 1998). Safety is one of the aspects of life for which the place where a person lives matters, particularly for women. According to a recent survey conducted in European cities, around 80% of men feel safe walking alone at night, but only 64% of women (European Commission, 2020b). Across EU regions, less than 40% of women feel safe in Észak-Alföld in Hungary (35%), Nord-Est in Romania (38%), and Kentriki Ellada in Greece (39%). At the other extreme, over 80% of women feel safe in Luxembourg (81%), in the capital city region in Lithuania (82%), in a number of regions in southern Austria and Slovenia (around 83%), and Noreste in Spain (84%) (Map 5.26). Differences between women and men are particularly large (above 30pp) in Wallonia in Belgium, Voreia Ellada in Greece, central Italy, and Dél-Dunántúl and Észak-Alföld in Hungary (Map 5.27).

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Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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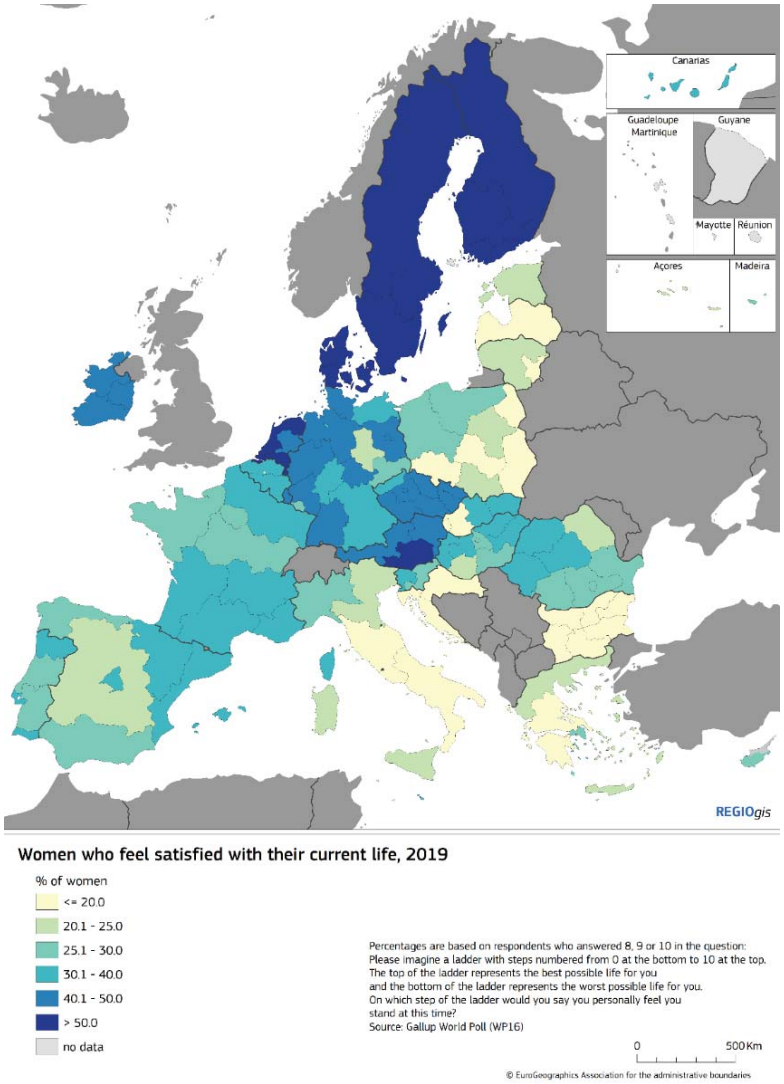
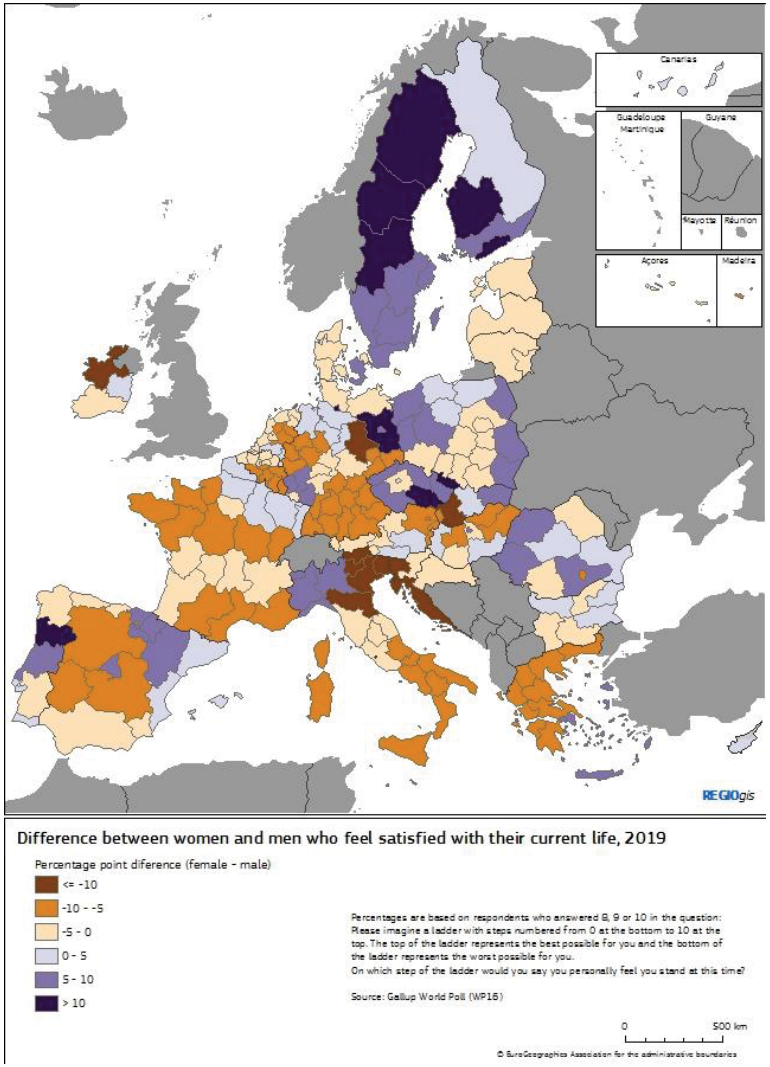
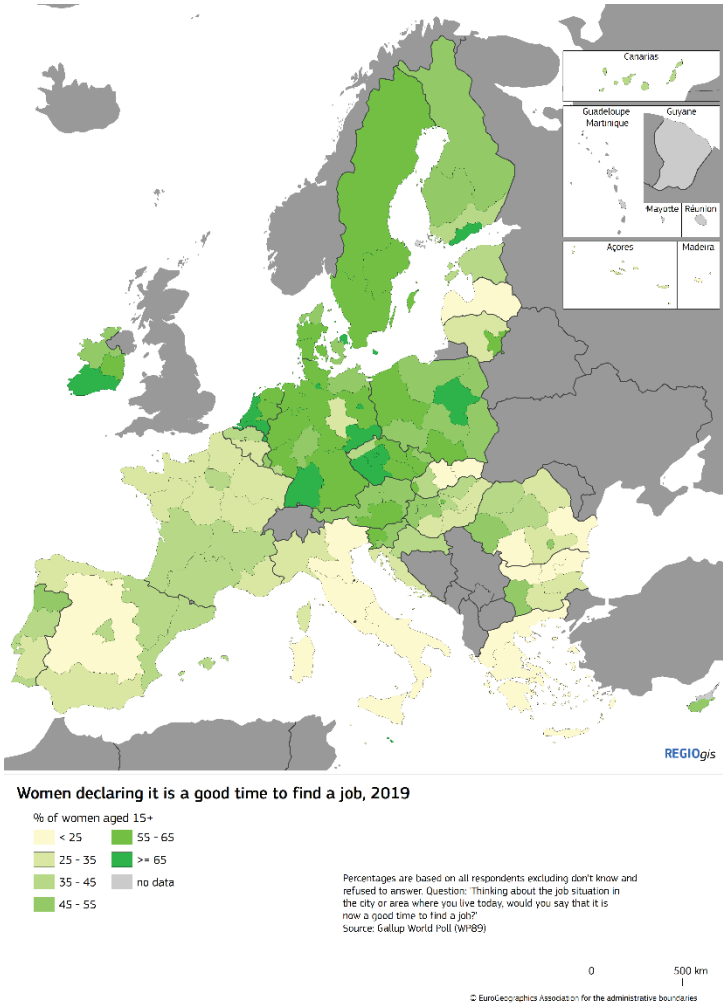
Map 5.22: Proportion of women feeling satisfied with their life, 2019



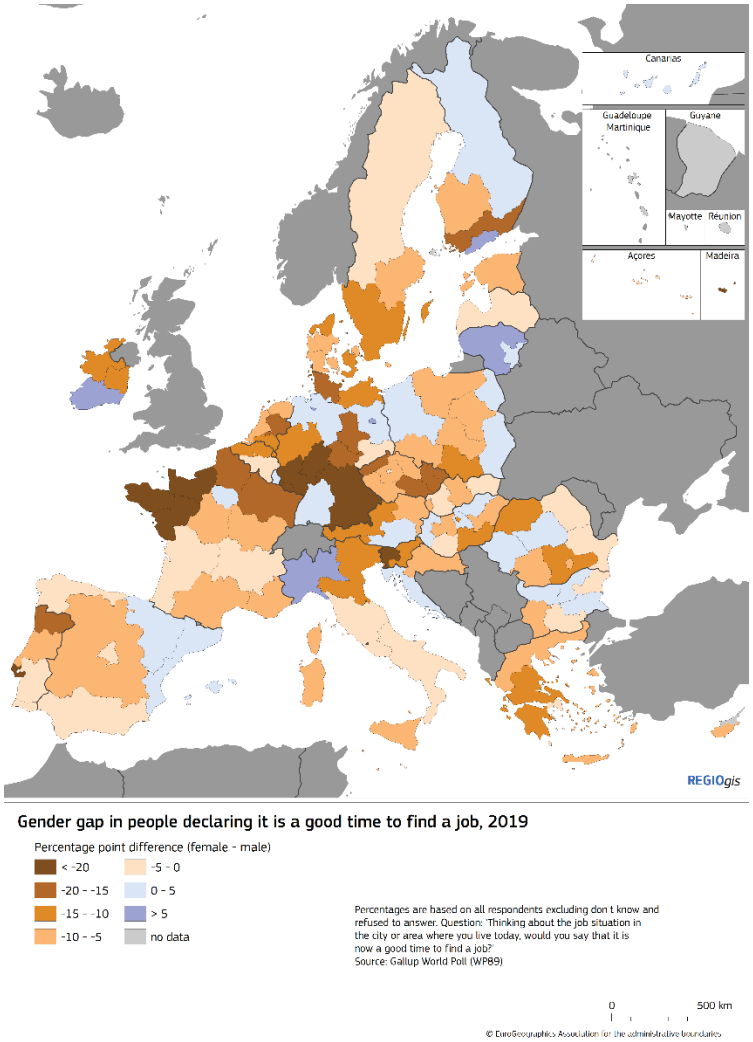
Map 5.23: Gender gap in feeling satisfied with life, 2019



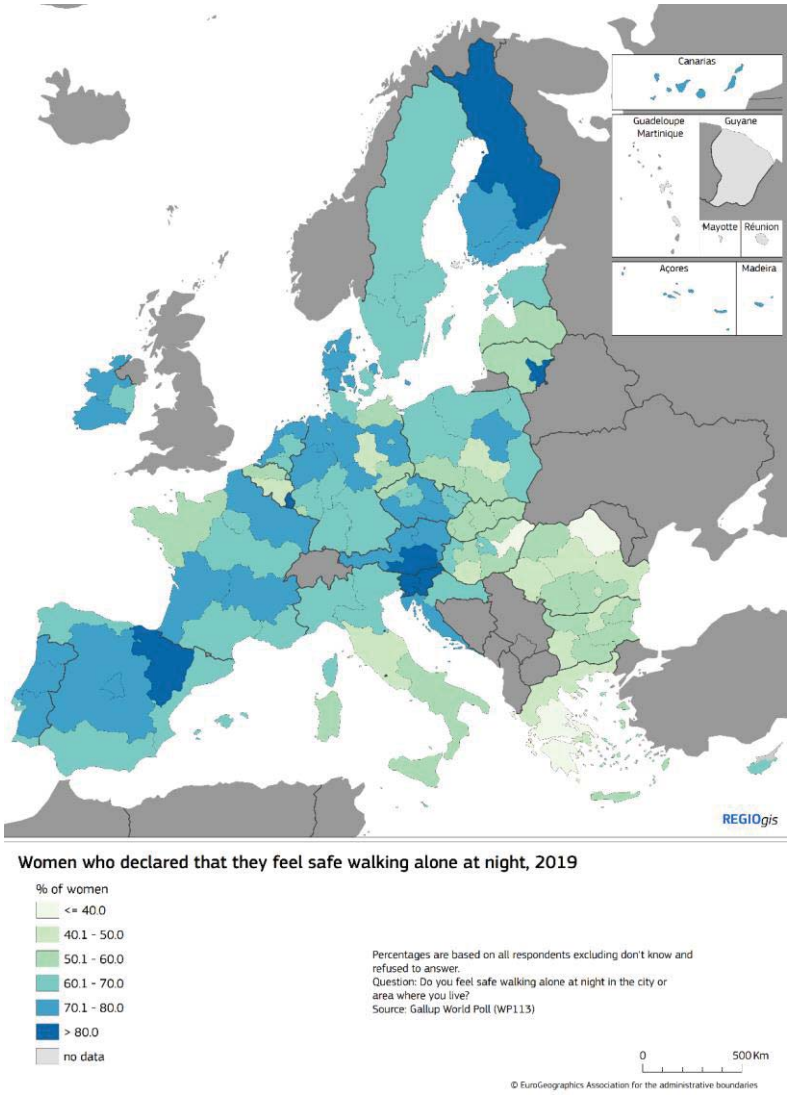
Map 5.24: Proportion of women believing it is a good time to find a job where they live, 2019



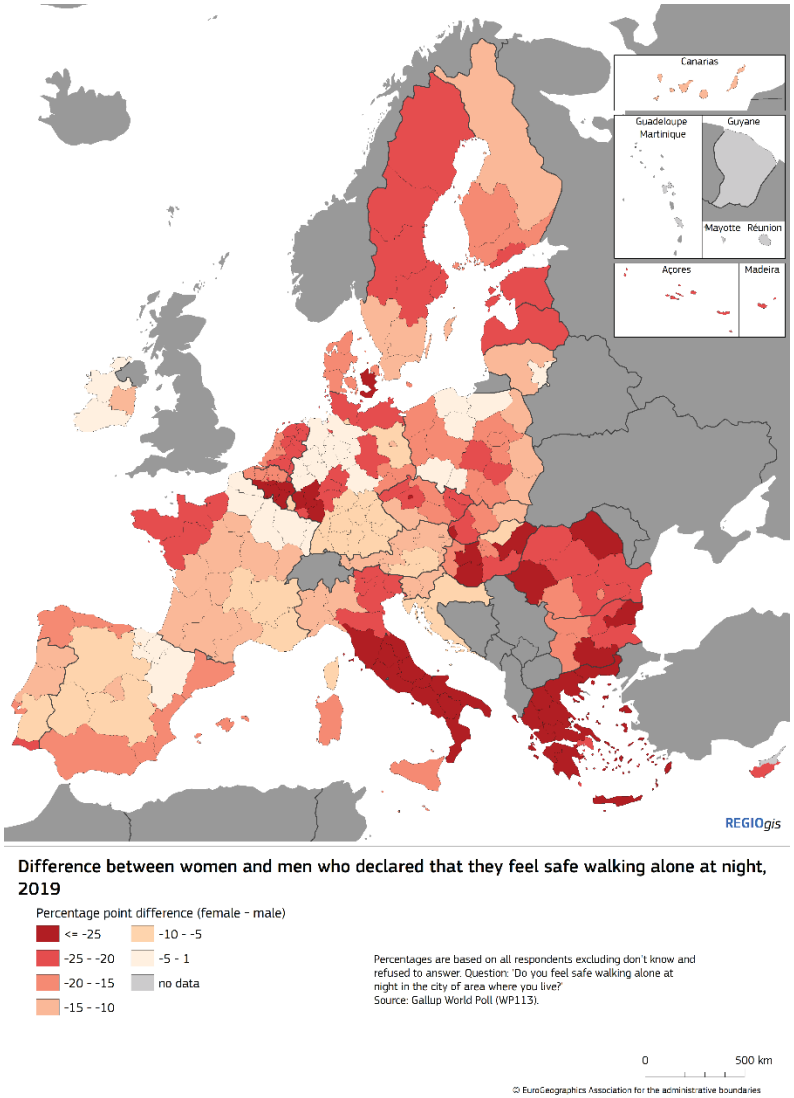
Map 5.25: Gender gap in believing it is a good time to find a job where they live, 2019



Map 5.26: Proportion of women d feeling safe walking alone at night, 2019



Map 5.27: Gender gap in feeling safe walking alone at night, 2019



When women achieve less, they also tend to be at a disadvantage[26]

Two composite indices have been constructed to capture how well women are achieving in different regions relative to the best performing women in the EU and relative to men, the *Female Achievement Inde*x for the former and the *Female Disadvantage Index* for the latter (Map 5.28).[27]

Women achieve most in Nordic Member States and most Austrian regions and achieve least in regions in the southern and eastern EU. They face the least disadvantage in the majority of regions in the Nordic countries as well as in France and Spain – least of all in Auvergne in France, La Rioja and Galicia in Spain and the capital city region in Finland – and are disadvantaged most in regions in Greece and Romania.

Comparing female achievements and disadvantages.

Regions where women achieve least and are disadvantaged most are largely located in the southern and eastern EU, while they achieve most and are disadvantaged least in the north-west of the EU (Map 5.28).

Above average achievements and below average disadvantage is the best combination. This is quite common in north-western regions and Spain. The next best combination is both achievements and disadvantage being above average, which implies that while women achieve much in these regions, they face disadvantages as men achieve more. This is the case in Czechia, Slovenia and some north-western EU regions.

The third best combination is low achievement and low disadvantage, which means in the regions concerned low achievement is not because of women being disadvantaged but men and women both achieving less than average. There are only 13 regions where this is the case: three each in Belgium and Bulgaria, two in Croatia and Lithuania and one in Latvia, Poland and Portugal.

The least favourable combination is low achievements and high disadvantage, which means that women have limited achievement because they are disadvantaged relative to men but also because men's achievements are low as well. The regions concerned account for 36% of the EU population and are mostly less developed ones in eastern and southern EU.

[26] This section is based on, and summarises, the findings in Norlén et al. (2021); for more details on the methodology, data, and additional results and analysis, see: https://ec.europa.eu/regional_policy/en/information/maps/gender-equality-monitor

[27] See box for a description of how the two measures are defined.

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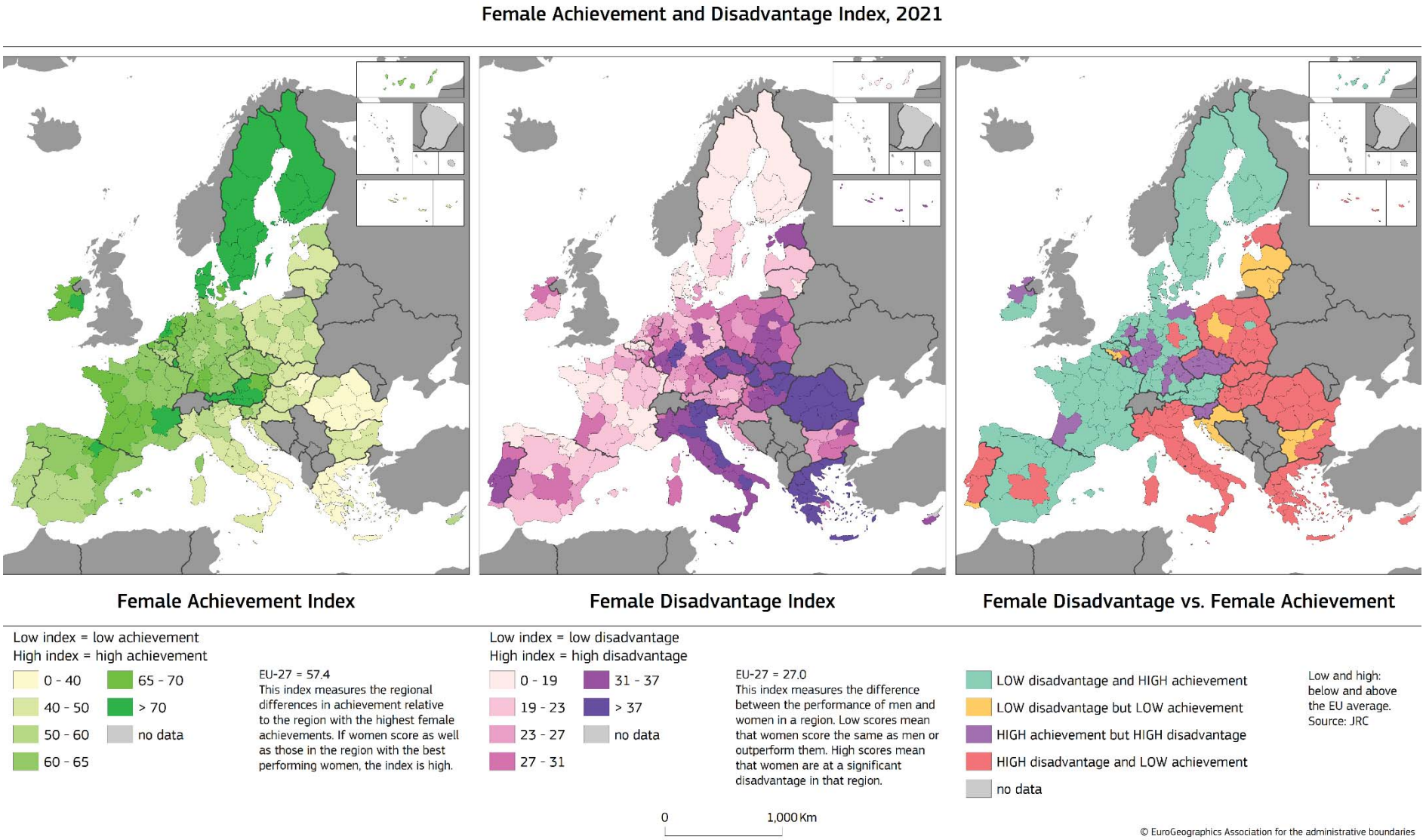
Map 5.28: Female Achievement index (left), Female Disadvantage index (centre) and comparison between the two (right)



The regional gender equality monitor: the conceptual framework

The regional gender equality monitor consists of two composite indices: the Female Achievement Index (FemAI) and the Female Disadvantage Index (FemDI). The first measures the level of achievement of women compared with the best performing region and varies between 0 (lowest performance) and 100 (best performance). The second measures women's performance relative to men and varies between 0 (signifying parity with men) and 100.

The indices are calculated for 235 NUTS2 regions and are based on 33 indicators grouped into 7 domains: Work and money, Knowledge, Time, Power, Health, Safety, security and trust and Quality of life.

Regional Gender Equality Monitor 2021			
1. Work and Money	**2. Knowledge**	**3. Time**	**4. Power**
Full-time and part-time employment rate	Graduates of tertiary education	Regularly participate in a leisure activity	Share of ministers in national governments
Unemployment rate	Formal or non-formal education and training	Donated money to a charity	Share of members in national parliaments
Employed with tertiary education	Early leavers from education and training*	Helped a stranger who needed help	Share of members in regional assemblies
Mean monthly earnings	Young people neither in employment nor in education and training	Volunteered time to an organisation	Share of members of regional executives
			Share of members of local/municipal councils
5. Health	**6. Safety, Security and Trust**	**7. Quality of Life**	
Self-perceived good or very good health	Safety at night	Feel well-rested	
Health problem that prevents from living a normal life	Relatives and friends count on for help	Smile or laugh a lot	
Life expectancy in absolute value at birth*	Women treated with respect and dignity	Experience enjoyment	
Malignant neoplastic and cardiovascular diseases death rate*	Voiced your opinion to a public official	Life satisfaction	
No unmet medical needs		Opportunities to make friends	
No unmet dental needs		Satisfied with the freedom	
33 indicators in Female Achievement Index		Maximum number of indicators by domain 6 in Health and Quality of Life	
30 indicators in Female Disadvantage Index (missing in FemDI indicated with *)		Minimum number of indicators by domain 4 in Work and Money, Knowledge, Time and Safety, Security and Trust	

The *Work and money* domain measures the extent to which there is access to employment and good working conditions and gender inequalities in financial resources. The *Knowledge* domain covers education attainment, participation in education and training, gender segregation and early leavers from education. The *Time* dimension covers the time spent in social activities, the *Power* dimension, the extent of involvement in decision-making, the *Health* domain, health status and access to health services, and the *Safety, security and trust* domain covers perceptions of personal safety in the areas where men and women live and the extent of trust towards family, social circles and authorities. The *Quality of life* covers various aspects of this as well as job satisfaction.

Indicators are from different data sources, but mainly Eurostat (EU-LFS and EU-SILC), Gallup World Poll and the European Institute of Gender equality (EIGE).

For more details, including, see Norlén et al. (2021) and interactive tools available at: https://ec.europa.eu/regional_policy/en/information/maps/gender-equality-monitor

5.6 Measuring social progress at the regional level[28]

The EU regional Social Progress Index (EU-SPI) is aimed at measuring *'the capacity of a society to meet the basic human needs of its citizens, establish the building blocks that allow peoples and communities to enhance and sustain the quality of their lives, and create the conditions for all individuals to reach their full potential.'*[29] The index builds on the approach of the global Social Progress Index[30]. Economic indicators are excluded from the index to allow it to be compared with indicators, such as GDP per head.

The 2020 edition[31] indicates a score of 67 out of 100 for the EU as a whole, with marked differences between EU regions at different stages of economic development (Map 5.29).[32] Nordic regions score relatively highly, while regions in the south and east of the EU tend to have low scores. All the top-10 regions are located in Sweden, Finland or Denmark, Övre Norrland in Sweden having the highest score, as in the 2016 version of the index. Regions in the bottom 10 are mostly in Bulgaria and Romania but also include the two French outermost regions of Guyane and Mayotte.[33]

[28] This section is based on, and adapted from, Annoni and Bolsi (2020); for more details on the methodology, data, and additional results and analysis, see: https://ec.europa.eu/regional_policy/en/information/maps/social_progress

[29] Source: https://www.socialprogress.org/index/global

[30] More information on the Global Social Progress Index is available at: https://www.socialprogressindex.com

[31] 'Comparison with the first edition has limited validity. When developing an aggregate index of this complexity at the regional level, each edition unavoidably includes refinements and modifications. This is even more valid for the first editions of an index, meaning that the 2020 EU-SPI is not fully comparable with its first edition'' (Source: Annoni and Bolsi, page 16).

[32] Interactive tools are available on DG REGIO Open Data Portal, at: https://cohesiondata.ec.europa.eu/stories/s/EU-Social-Progress-Index-2020/8qk9-xq96

[33] The results for the French outermost regions need to be interpreted with caution because some indicators were not available for these regions and because of their specific context far from the European mainland.

EU-SPI: The EU Regional Social Progress Index

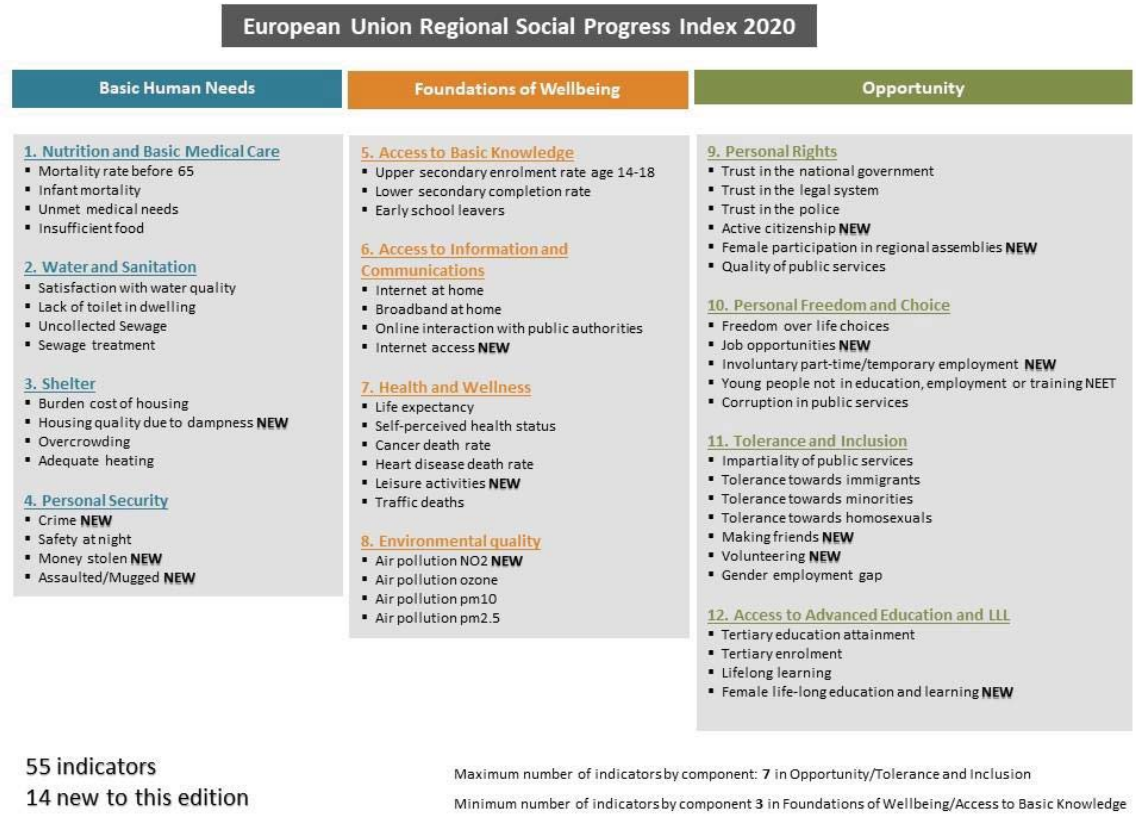
The regional EU-Social Progress index is a composite indicator, first published in 2016. The 2020 edition is based on 55 individual social and environmental indicators.

The index includes three dimensions of social progress: *basic human needs*; *foundations of well-being* and *opportunity*, each of which has four components.

The index is based on the assumption that these three dimensions are necessary to describe social progress. Basic needs have to be satisfied to achieve good levels of social development. The foundation dimension includes more advanced factors of social and environmental progress, while the opportunity dimension includes the 'most advanced' elements of a cohesive and tolerant society. From a policy perspective, these three dimensions involve different levels of difficulty. It is, for example, easier to satisfy basic needs than to improve societal attitudes.

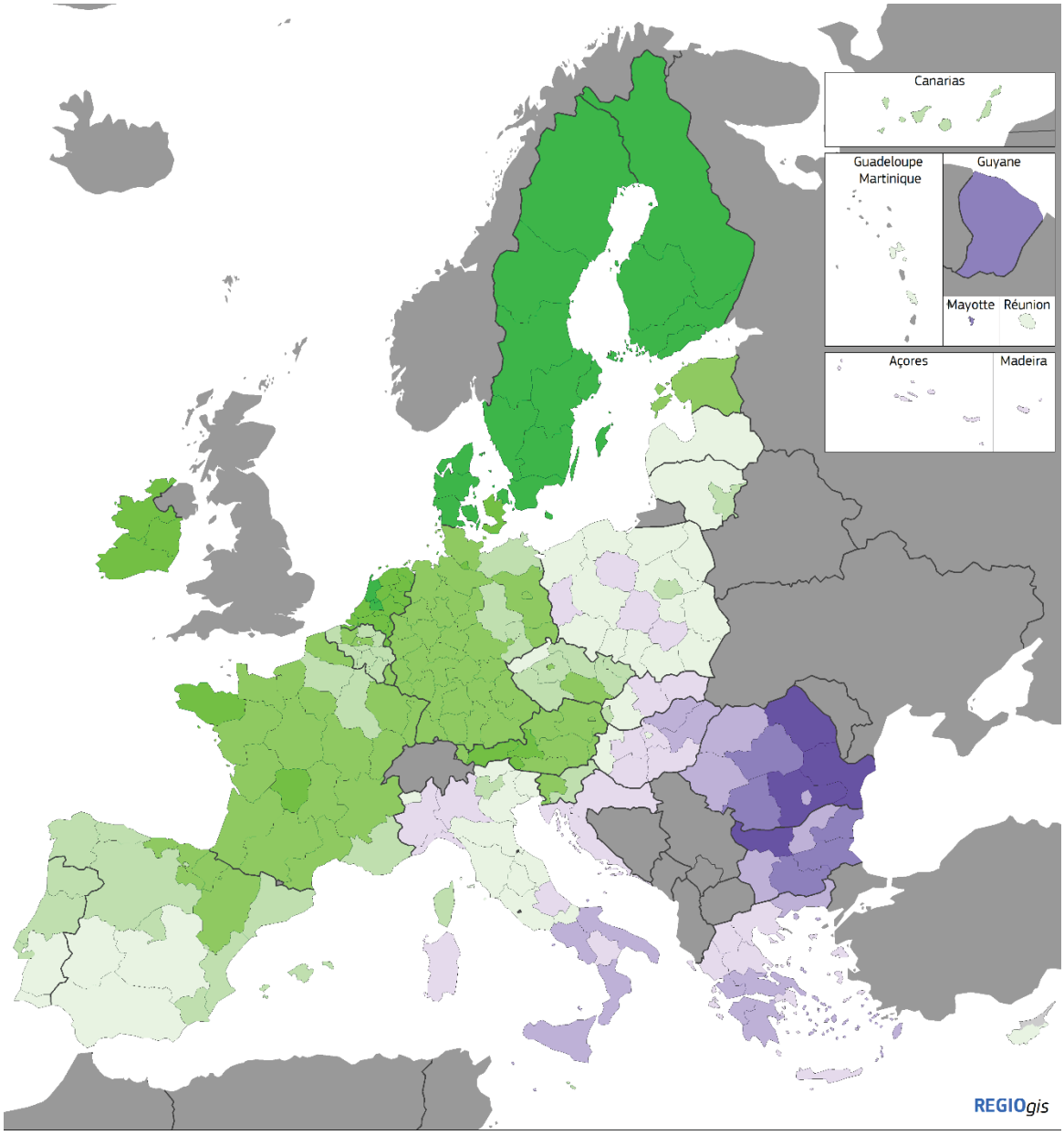
Data come from a range of sources, including Eurostat, Gallup World Poll, DG REGIO, the European Environmental Agency and the European Institute for Gender Equality.

For more details see: Annoni and Bolsi (2020) and
https://ec.europa.eu/regional_policy/en/information/maps/social_progress2020/



Source: Annoni and Bolsi, 2020

Map 5.29: The EU Social Progress index, 2020

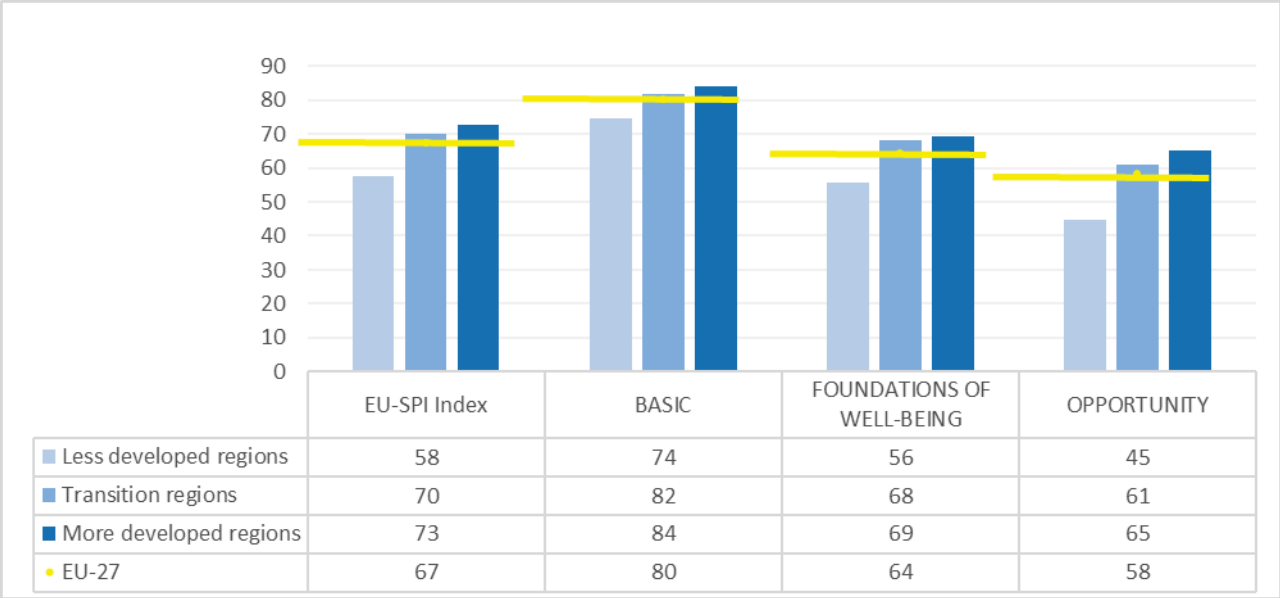


Source: Annoni and Bolsi (2020)

While more developed regions have an average score of 73 and transition regions one of 70, the score for less developed regions is only 58 (Figure 5.25).

Although the EU - as a whole - scores well on the basic components (80 out of 100), it does less well on the foundations of well-being (64) and even less well on the opportunity dimension (58) (Map 5.30). Most regions score well on 'basic human needs', except for those in Romania and Bulgaria. There are larger differences for the other two dimensions, for which a clear spatial pattern emerges, with regions in southern and eastern EU having low scores for the opportunity dimension, in particular (Map 5.30).

Figure 5.25: EU-SPI 2020 by group of regions



	EU-SPI Index	BASIC	FOUNDATIONS OF WELL-BEING	OPPORTUNITY
Less developed regions	58	74	56	45
Transition regions	70	82	68	61
More developed regions	73	84	69	65
EU-27	67	80	64	58

Source: Annoni and Bolsi (2020), DG REGIO calculations

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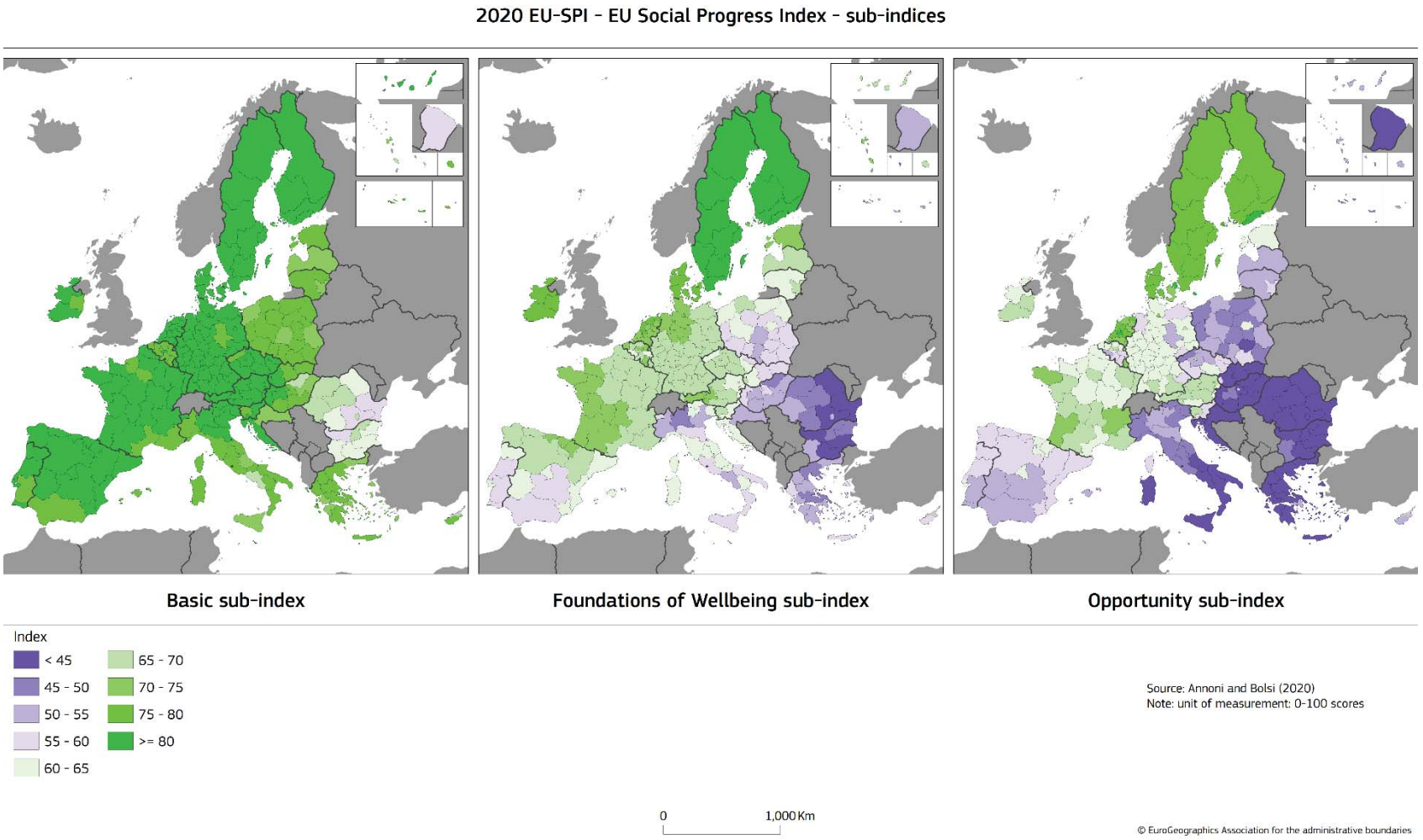
Map 5.30: 2020 EU-SPI results on the three dimensions: Basic, Foundations of Well-Being and Opportunity



Source: Annoni and Bolsi (2020)

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PART 12/16

COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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CHAPTER 6 A EUROPE CLOSER TO ITS CITIZENS

- Since 2010, there has been a natural reduction in population as the number of deaths have increasingly outnumbered births. Net inward migration has meant that the total population of the EU has not yet started to shrink, but already one in three people live in a region that lost population over the past decade.
- Because of a declining number of women of a child-bearing age and a fertility rate that has been below replacement level for four decades, population projections show that the EU population will start to shrink in the coming decades. The share of population living in a shrinking region is projected to reach 50% by 2040.
- Life expectancy has been increasing and converging with the EU over the past decade, but gaps remain substantial. Life expectancy is particularly low in eastern rural regions, while in the north-western EU Member States, rural life expectancy is much the same or higher than in urban regions.
- Thanks to a high and increasing life expectancy and the ageing of the baby boom generation, the population of 65 and over is projected to grow in virtually all regions, while the number of people of working age, teenagers and children is projected to decline. Reductions are projected to be more than double the EU average in many southern and eastern regions.
- In the EU, people in rural areas are, on average, equally satisfied with life as those in cities. Whereas more city dwellers are satisfied with life than rural residents in eastern Member States, the reverse is the case in north-western ones.
- Household incomes are higher on average in cities than in rural areas in almost all Member States. In the north-western EU, however, more rural households are satisfied with their financial situation than households in cities. This may be due to the high and growing cost of housing in the latter compared to the former.
- Rural residents have to travel further than their urban counterparts to reach many public and private services. Although some local services are situated within walking or cycling distance, rural residents tend to have to rely on cars or buses to reach most services.
- Regional centres offer more services to people living in the surrounding area. These villages, towns and smaller cities that are the largest settlement within a 45 minute drive are more likely to have shops, primary and secondary schools, banks, doctors, pharmacies, hospitals and a university, meaning that they can function as an economic and social anchor-point for the wider region.
- Compared to city dwellers, rural residents are less likely to trust the EU, say that their voice counts in the EU or feel attached to the EU. This urban-rural divide can contribute to political polarisation. Rural residents are more likely to trust regional and local governments, highlighting the importance of involving the latter in regional and local development strategies.

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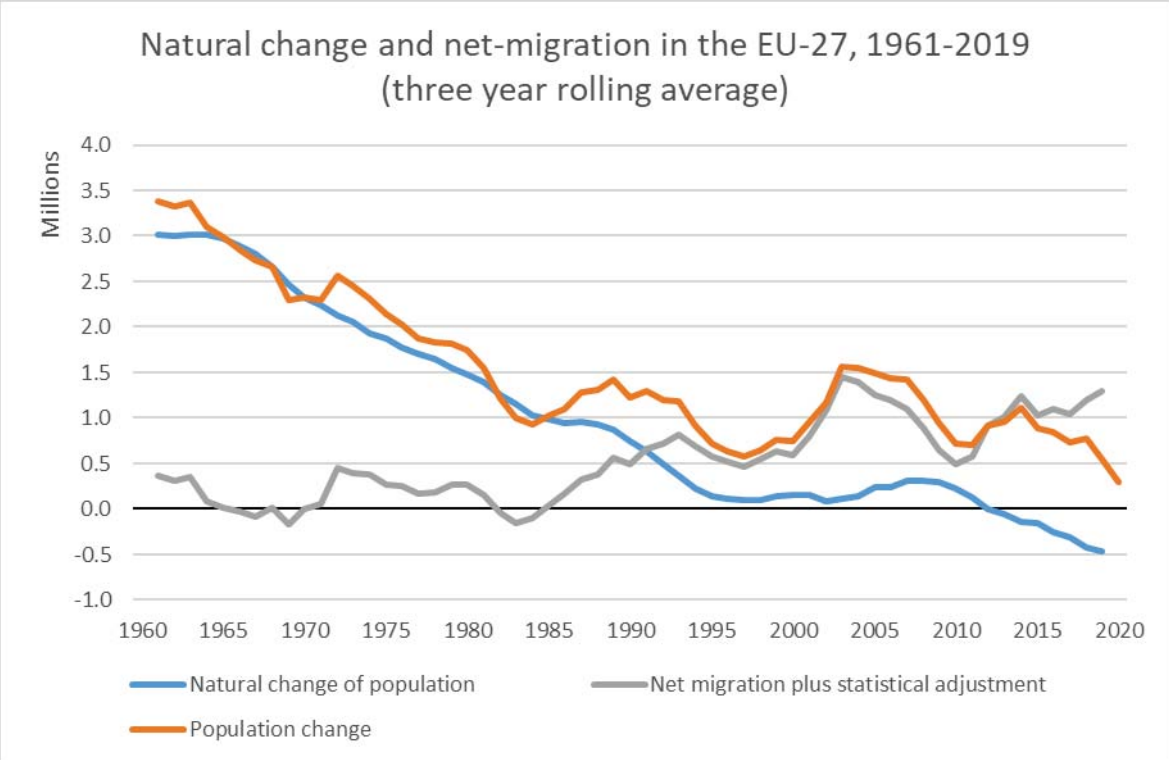
6.1 Demographic change

Throughout the 1960s, 1970s and 1980s, natural population growth was the main source of population growth in the EU. Every year, more babies were born than people passed away. On average, natural growth added 2 million people a year to the EU population over this period, Natural growth, however, steadily declined over these three decades (Figure 6.1). Over this period, migration had a relative small impact, adding only 150,000 people a year to total population, and in some years, more people moved out of the EU than moved in.

Since 1992, migration has contributed more than the natural change to population growth in the EU. During the 1990s and 2000s, natural growth was low, adding only 250,000 people a year to population compared to 800,000 from migration. In the 2010s, natural growth became negative, leading to a natural reduction in population of 150,000 a year, while migration added one million a year.

Figure 6.1 Total change in population, natural change and net migration in the EU, 1961-2019



Source: Eurostat [demo_gind]

The higher levels of net inward migration since 2000 have led to an increase in the population born outside the EU. In 2020, the share of population born outside the EU reached 8%, up from 6% in 2011. The total foreign-born population, including those born in other EU Member States, reached 12% in 2020, compared to 10% in 2011 and 8% in 2001.

The increase in foreign-born population was mainly concentrated in the southern and north-western Member States, where it increased from 5% of the total to 12% and from 11% to 16%, respectively (Figure 6.2). This puts north-western EU slightly ahead of the USA, which had a

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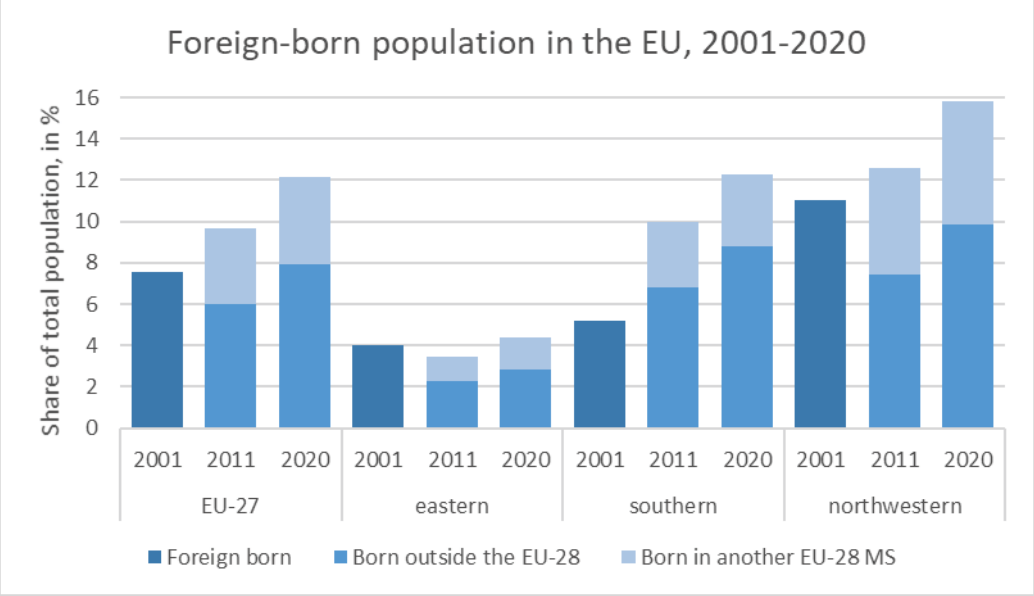
foreign-born population share of 14% in 2019[1]. In the eastern EU, the share of foreign-born is much smaller (4% compared to 12% in the EU). It has also not changed much over the past two decades.

Figure 6.2 Foreign-born population in the EU, 2001-2020



Source: Eurostat tables: 2001: cens_01nscbirth, 2011: cens_11cob_n, 2020: migr_pop3ctb.

6.1.1 During the 2010s deaths outnumbered births

During the 2010s, the EU population grew by 1.9 per 1000 inhabitants a year (Table 6.1). This was considerably slower than in the 2000s, when the rate was 2.9 per 1000. In the 2010s, the natural change was negative (-0.3 per 1000), but this was offset by net inward migration (of 2.2 per 1000). Over this period, the highest population growth rate was in the north-western EU (4 per 1000 inhabitants a year) through a combination of a positive natural change and net inward migration. Population growth in southern EU was lower, as a result of a larger natural reduction and a similar net-migration rate. The population in eastern EU declined (by 2 per 1000) because of net outward migration and a significant natural reduction (Table 6.1).

[1] Movement within the EU is considerably easier than moving to the USA from abroad, but harder than moving within the USA. As a result, neither the share of foreign-born nor the share of those born outside the EU is the exact equivalent to the foreign born in the USA. The share of non-EU born in north-western EU is 10% which is lower than the share of foreign-born in the USA.

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Table 6.1 Natural population change, net migration and total population change, during the years 2010-2019

Average annual change per 1000 residents	Natural population change	Net migration	Total population change
EU	-0.3	2.2	1.9
North-Western	0.8	3.6	4.4
Southern	-1.1	2.1	1.0
Eastern	-1.6	-0.4	-2.1

Source: DG REGIO calculations based on Eurostat [demo_r_gind].

In all three geographic regions, the natural change and net-migration follow the same pattern: highest in urban regions and lowest (and often negative) in rural ones (Table 6.2). This leads to substantial differences in demographic trends, with relatively high population growth in urban regions in the north-western EU (7 per 1000 residents) and significant decline in rural regions in the eastern and southern EU (4 per 1000 residents). The natural change is negative or close to zero in urban, intermediate and rural regions in three geographic regions of the EU, with only one exception: north-western urban regions. This underlines the importance of migration for total population change. Net migration is positive for all three types of region at the EU level, but much more so for urban than rural regions (3.3 per 1000 as against 0.4). Net inward migration offset a negative natural change in north-western rural regions, southern intermediate regions and eastern urban regions. Only eastern intermediate and rural regions had net outward migration, which further added to the natural reduction in population.

Examining the changes by metro region shows that the fastest total population growth occurred in the capital metro regions, while in the non-metro regions, it grew more slowly or declined. In the north-western EU, all three types of region experienced population growth. In the southern EU, only the metro regions grew, while in the eastern EU only the capital metro regions grew. The high population growth rates in the capital metro regions is likely to lead to pressure on the housing market and more demand for public and private services.

Table 6.2 Natural population change, net migration and total population change by urban-rural regional typology and by type of metro region, during the years 2010-2019

Average annual change per 1000 residents	Natural population change	Net migration	Total population change
North-Western			
Urban	2.5	4.1	6.6
Intermediate	0.1	3.8	3.9
Rural	-1.3	2.5	1.2
Southern			
Urban	0.0	2.5	2.6
Intermediate	-1.7	1.9	0.2
Rural	-4.7	1.0	-3.7
Eastern			
Urban	-0.5	2.7	2.2
Intermediate	-1.9	-0.4	-2.3
Rural	-1.9	-2.3	-4.2
EU			
Urban	1.2	3.3	4.5
Intermediate	-0.9	2.1	1.2
Rural	-2.0	0.4	-1.6

Average annual change per 1000 residents	Natural population change	Net migration	Total population change
North-Western			
capital metro	5.1	3.3	8.4
other metro	0.5	4.5	5.0
non-metro	-0.8	2.7	1.8
Southern			
capital metro	1.0	2.7	3.7
other metro	-0.5	2.5	2.0
non-metro	-2.5	1.5	-1.0
Eastern			
capital metro	-0.3	4.7	4.5
other metro	-1.0	0.2	-0.7
non-metro	-2.4	-2.3	-4.7
EU			
capital metro	2.7	3.5	6.2
other metro	0.0	3.2	3.2
non-metro	-1.8	0.8	-1.0

Source: REGIO calculations based on Eurostat table, demo_r_gind3

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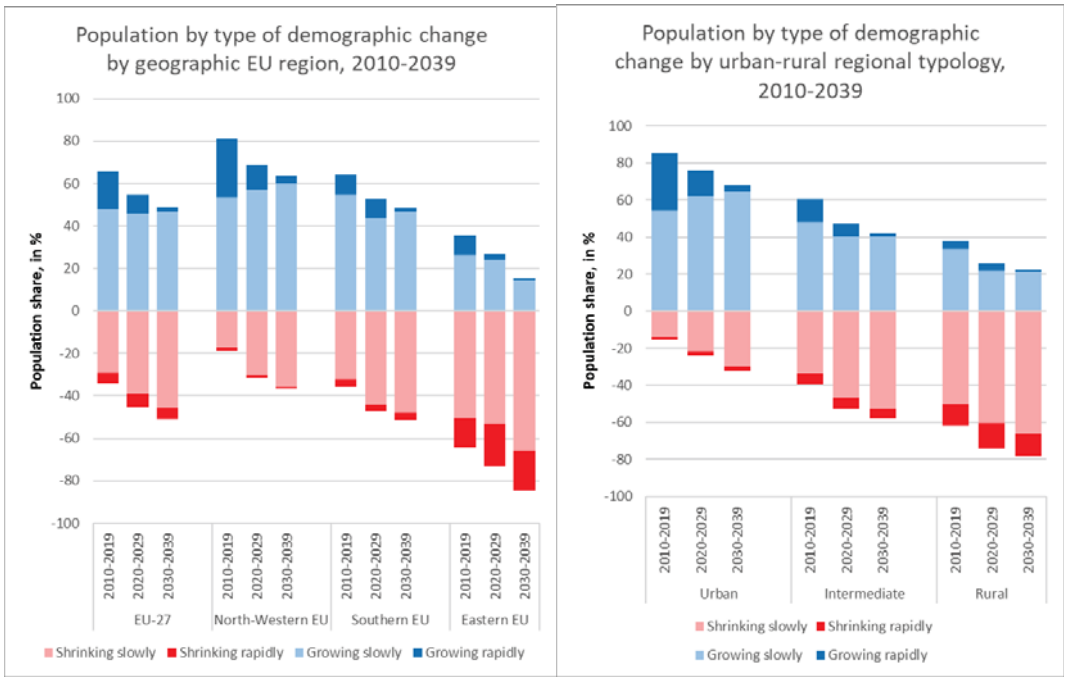
6.1.2 More and more regions will need to adjust to a shrinking population

The population reductions in the eastern EU mean that two out of three people there lived in a region that lost population over the past decade. This was the case for only one out of five people in the north-western EU and one out of three in the southern EU (3). Projections indicate that the share of people in the EU living in a shrinking region will increase from 34% in 2020 to 45% in 2030 and 51% in 2040. This will affect all three geographic regions, with the share of population living in a shrinking region increasing by around 18 pp between 2020 and 2040, with urban, intermediate and rural regions being affected equally.

Taking account of the speed of change, the people living in rapidly growing regions is likely to shrink over time (from 18% of the EU total in 2020 to 2% in 2040), while the share living in rapidly declining (or depopulating) regions is likely to remain stable (at about 5%). Rapid reduction primarily affects people living in eastern regions (14% in 2020 and 30% in 2030). Southern regions have a smaller share of people living in a rapidly shrinking region (4% and projected to remain stable), while in the north-western EU, rapidly shrinking regions are almost entirely absent.

Rapid reductions in population are more likely to occur in rural regions than in urban ones (11% as against 1%) and this gap is likely to remain in the future (14% as against 3% in 2030).

Figure 6.3 Population by type of demographic change by geographic EU region and by urban-rural typology, during the years 2010-2039



Source: Eurostat [demo_r_pjangrp3] for the years 2010-2019 and [proj_19rp3] for the years 2020-2029 and 2030-2039. Share of population refers to the population at the end of the period, i.e. 1/1/2020, 1/1/2030 and 1/1/2040 respectively. For some regions, a slightly shorter time period was used.

Note: Rapid growth is defined as at least 7.5 per 1000 inhabitants a year. Rapid shrinking is -7.5 per 1000 inhabitants a year.

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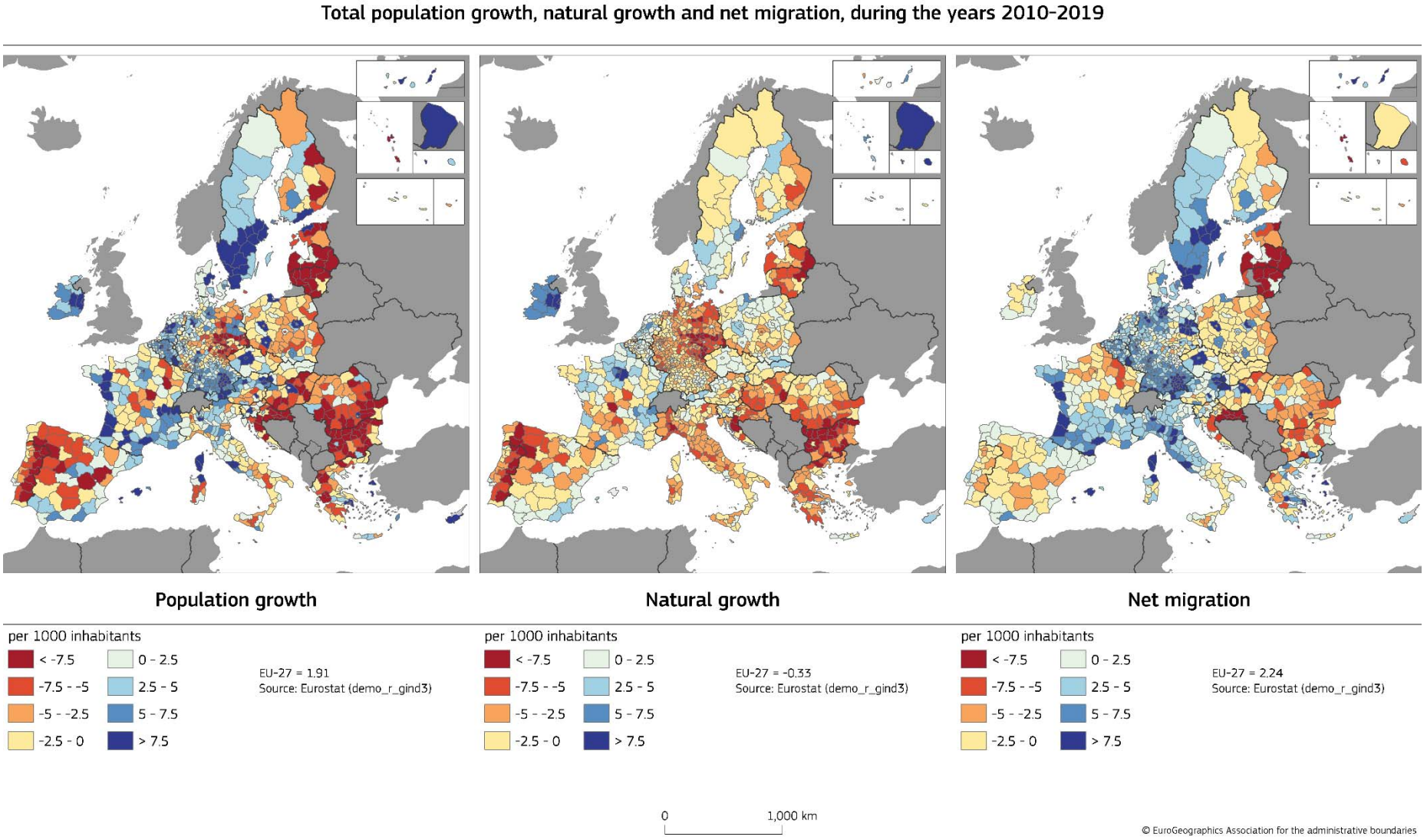
Map 6.1 Total population growth, natural growth and net migration, during the years 2010-2019



6.1.3 Life expectancy is high and converging

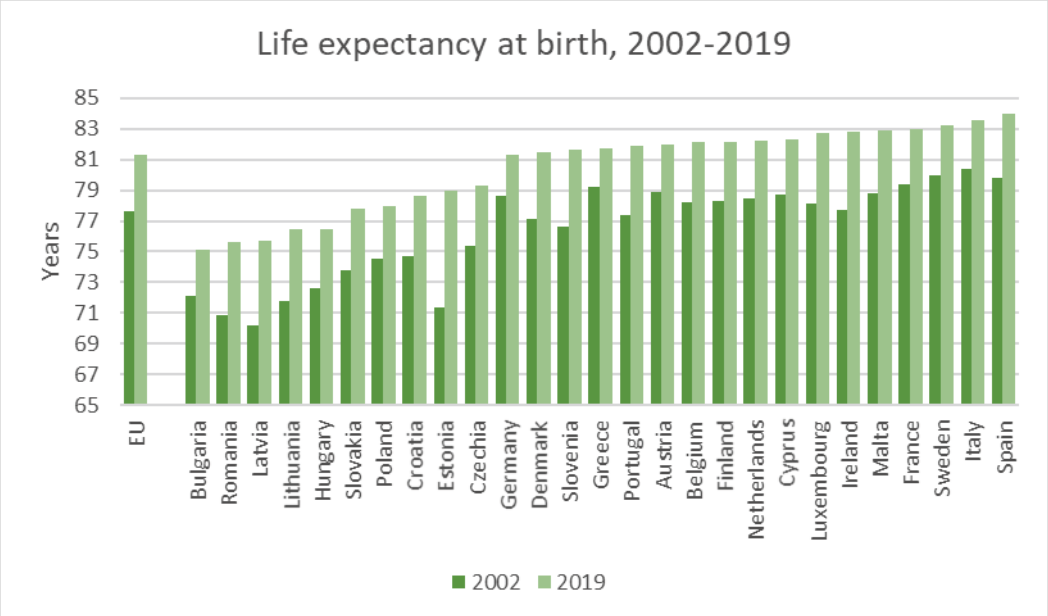
Natural population change is calculated by subtracting deaths from births. The number of births depends on the fertility rate and the age structure of the population. A higher fertility rate means more births, as does a larger share of women of child-bearing age. The number of deaths depends on both life expectancy and the age structure. A higher life expectancy means fewer deaths as does having a lower proportion of older people. Whereas fertility rates and life expectancy are widely known, the impact of the age structure is less prominently reported. This, however, is substantial and difficult to change. It is called 'population momentum' to underline this point.

The EU has three key demographic characteristics: 1) a high life expectancy, 2) a stable and relatively low total fertility rate and, as a consequence, 3) an old and ageing population.

The EU has one of the highest life expectancies at birth in the world, 81.3 years in 2019 (Figure 6.4). Outside Europe, only eight countries have a higher life expectancy (source UN WPP 2019[2]). People living in Spain and Italy have the highest expectancy in the EU (84.0 and 83.6 years at birth, respectively), while the lowest is in Romania and Bulgaria (75.6 and 75.1, respectively).

Life expectancy at birth has increased in all Member States between 2002 and 2019[3]. At the EU level, it increased from 77.6 in 2002 to 81.3 in 2019. Over this period, life expectancy also converged at the national and regional level because the increase in life expectancy was faster in the countries and regions with a lower life expectancy.

Figure 6.4 Life expectancy at birth, 2002-2019



Source: Eurostat table [demo_mlexpec]

Life expectancy at birth is below 76 in many parts of Bulgaria and Romania and the eastern regions of Hungary, as well as in Latvia (Map 6.2). In a number of regions, mainly located in France, Italy and Spain but also in southern Sweden, life expectancy is over 83. Infant mortality

[2] United Nations World Population Prospects, 2019. https://population.un.org/wpp/

[3] It dropped in 2020 due to the COVID pandemic. See specific COVID section for more detailed analysis.

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has a major impact on life expectancy. In the EU, infant mortality is generally low. In 2019, an average of 3.4 children per 1000 born alive died before reaching one year of age. Infant mortality, however, was above 6 per 1000 in 18 NUTS-2 regions, mainly in Romania Bulgaria, all the French overseas regions, and the two Spanish regions in North Africa of Ceuta and Melilla (Map 6.3).

On average, life expectancy is four years lower in less developed regions (78.3) than in more developed ones (82.7). The gap, however, has been shrinking with larger increases in less developed regions than in more developed ones (Table 6.3)

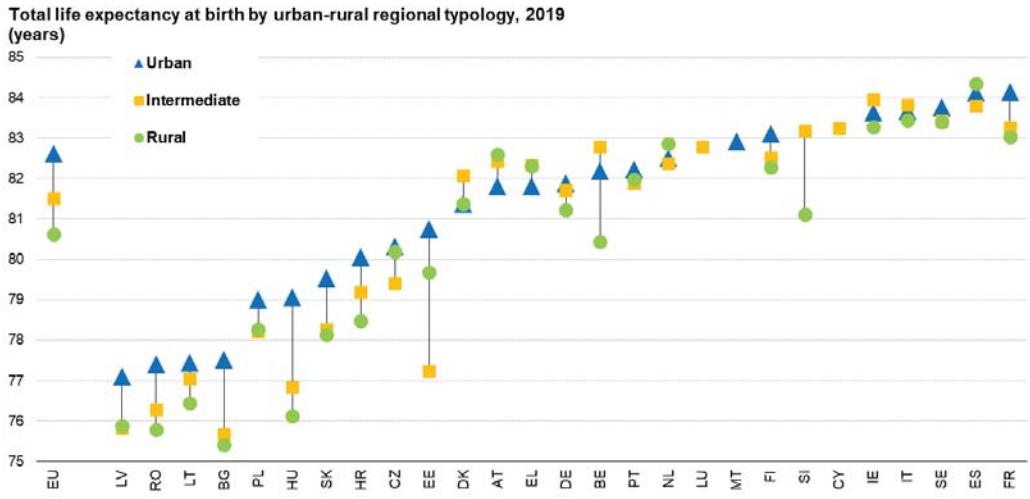
Table 6.3 Life expectancy at birth by type of region, 2009-2019

	2009	2019	2009-2019
Less Developed	76.4	78.3	1.9
Transition	80.3	82.0	1.7
More Developed	81.1	82.7	1.6
EU27	79.7	81.4	1.7

Source: REGIO calculations based on Eurostat [demo_r_mlifexp]

Average life expectancy is two years higher in urban regions than in rural ones[4]. This difference is primarily due to the countries with a relatively low life expectancy, where the gap between urban and rural regions tends to be wider. In a number of countries with a high life expectancy, expectancy is, in fact, higher in rural regions than in urban ones. This is the case in Spain, Austria, Greece and Netherlands.

Figure 6.5 Total life expectancy at birth by urban-rural regional typology, 2019



Source: REGIO calculations based on Eurostat [proj_19ralexp3]

Note: Countries ranked by life expectancy in urban regions (or intermediate region in Member States which do not have an urban region)

[4] This new set of life expectancy at birth figures for NUTS-3 regions differs slightly from the national and NUTS-2 figures and should not be compared with the latter. For more information see: https://ec.europa.eu/eurostat/cache/metadata/Annexes/proj_esms_an24.pdf

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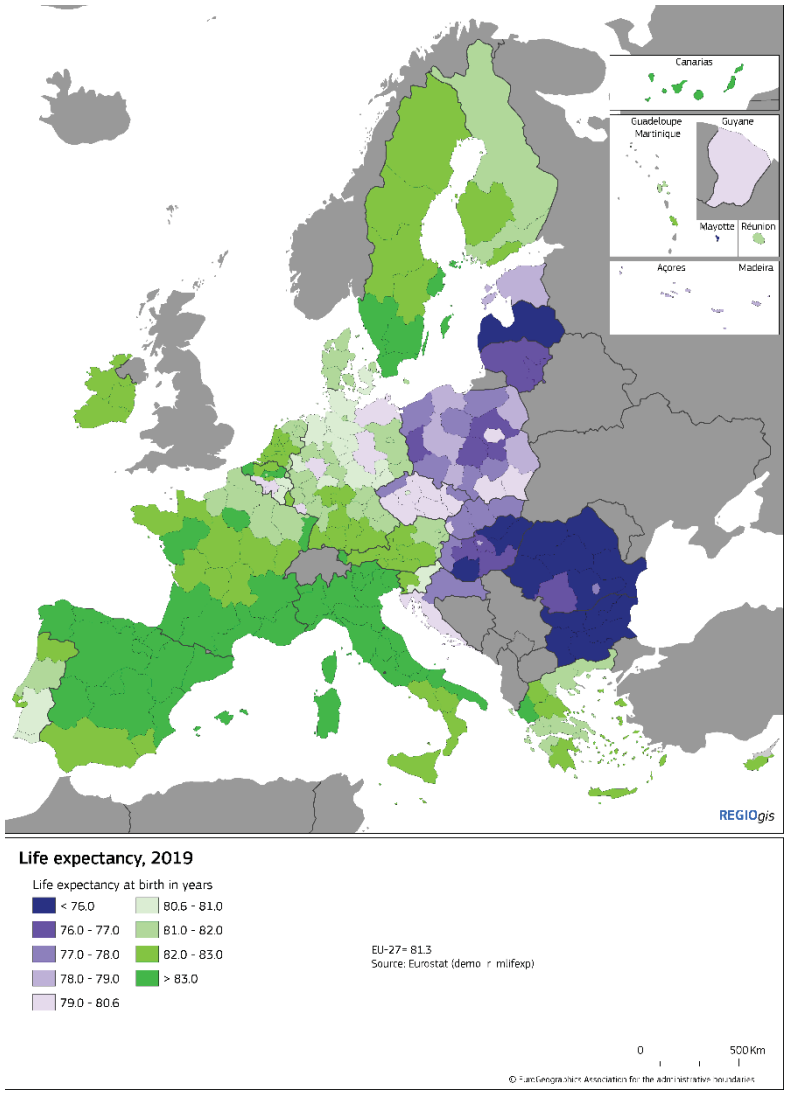
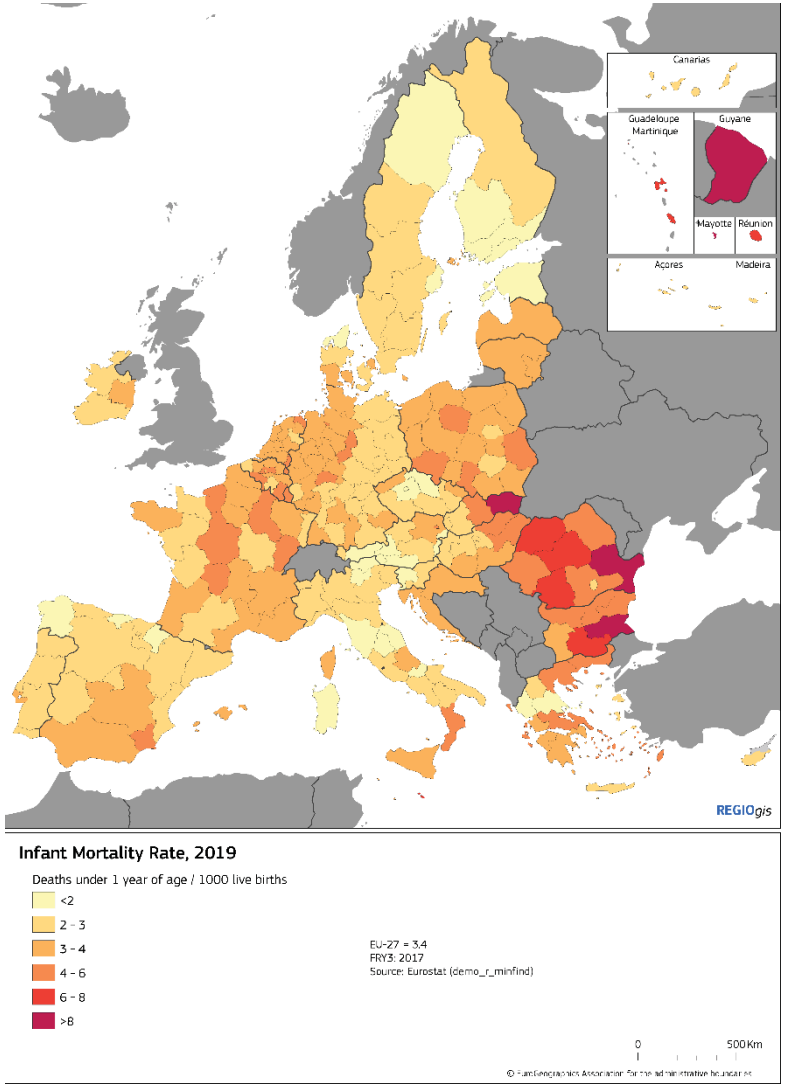
Map 6.2 Life expectancy at birth, 2019



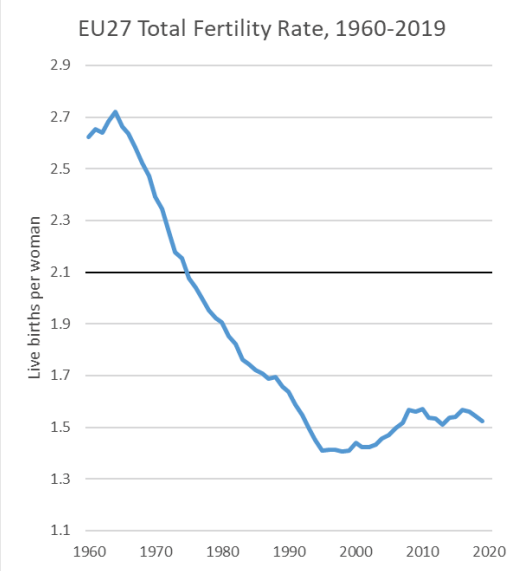
Map 6.3: Infant mortality, 2019



6.1.4 Fertility is low and stable

In the EU, a total fertility rate of 2.1 is needed, in the absence of migration, to have a stable population. The last time the overall fertility rate in the EU was this high was in 1975. Since 1990, the rate has hovered around 1.5 (Figure 6.6). As a result, the natural population change became negative in the EU in 2010. Without net inward migration, the natural change would have become negative even earlier.

Figure 6.6 EU Total Fertility rate, 1960-2019



Source: REGIO calculations based on Eurostat [demo_find] and the Human Fertility Database

Fertility rates differ between and within Member States. At the EU level, fertility rates are slightly higher in rural regions than in urban ones (1.6 vs 1.5). Because the share of women of childbearing ages in rural regions is smaller than in urban regions, rural regions have a lower birth rate despite having a higher fertility rate.

The gap between urban and rural regions is widest in Bulgaria, Hungary, Lithuania and Romania. In only four Member States is the urban fertility rate higher than the rural (Belgium, Portugal, Slovakia and Spain).

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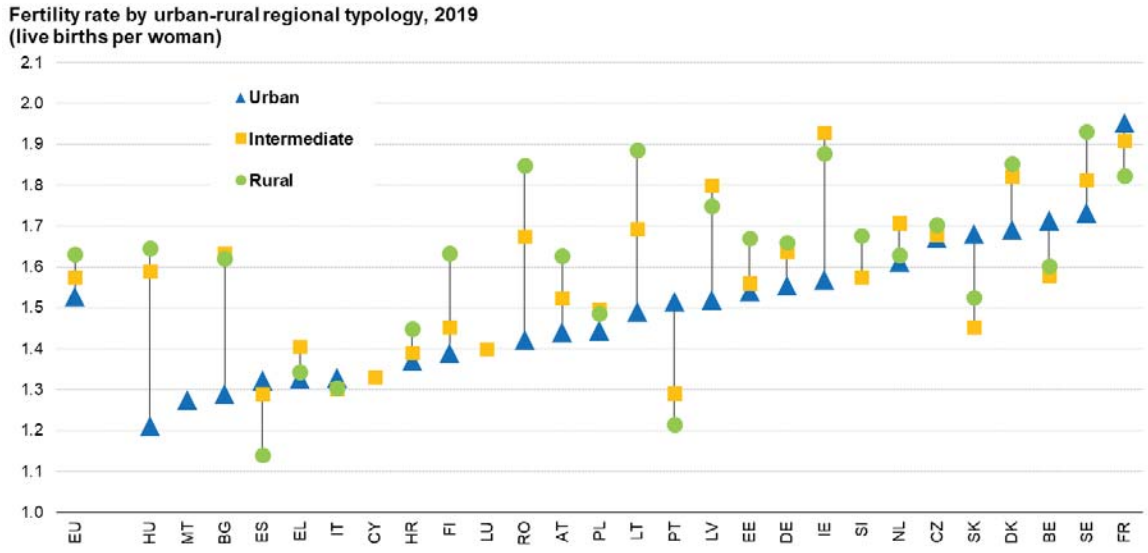
Figure 6.7 Fertility rate by urban-rural regional typology, 2019



Source: Eurostat [demo_r_find3]

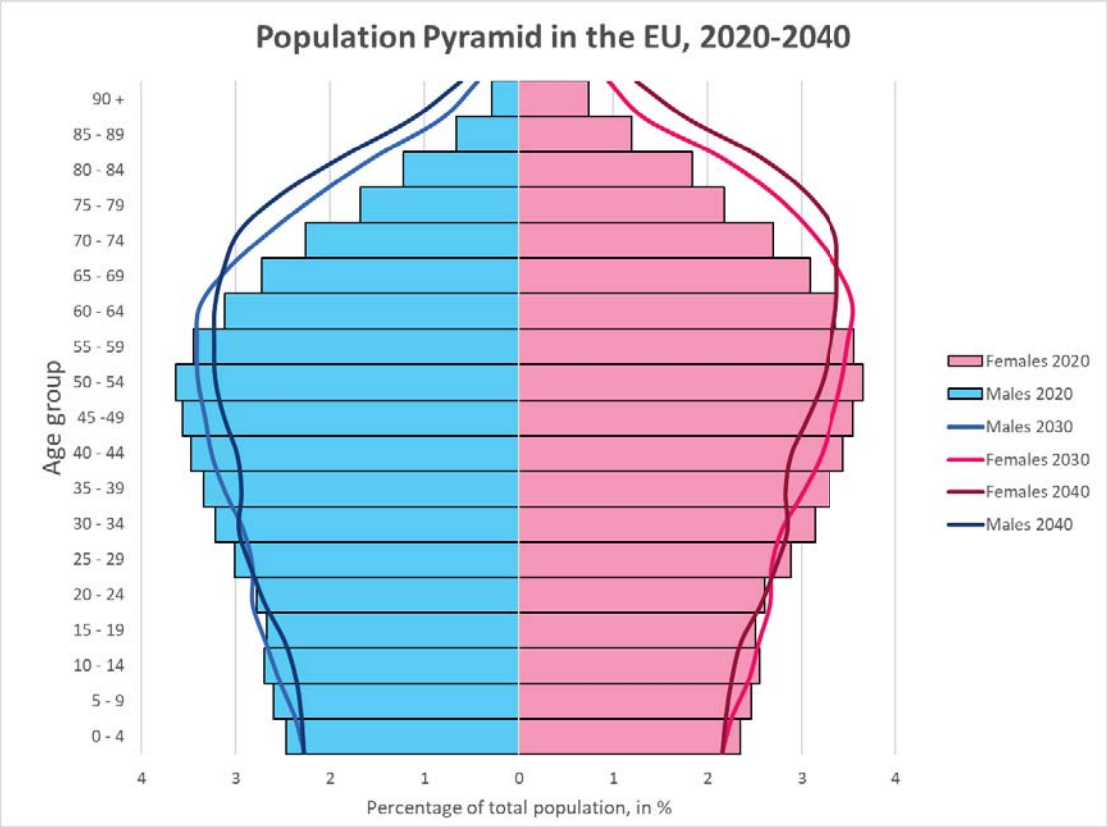
6.1.5 An ageing baby boom

When the first population pyramid was published in 1874, high birth and death rates meant that it actually resembled a pyramid: wide at the bottom and narrow at the top. The growth of life expectancy and low fertility rates in the EU have led to a radically different age structure. Today, the EU's population 'pyramid' looks more like a light bulb, narrower at the bottom and wider in the middle before becoming narrow again at the top (Figure 6.8). The wide middle is due to a larger number of births in the past, often referred to as a baby boom.

The EU population aged 0 to 29 is 44 million (or 24%) smaller than the population aged 30 to 59. This generation gap is the equivalent of 10% of the EU's total population and is significantly larger than the current number of people born outside the EU (44 million as against 36 million[5]). Although future migration is likely to fill some of this gap, it is unlikely to fill the whole gap. As a result, the EU population will start to shrink in the coming years and decades. For example, Eurostat's latest population projections comprise one baseline scenario and five sensitivity tests and all of them show a declining EU population. The baseline scenario indicates that the population of 65 and over will grow rapidly by 18% by 2030 (Figure 6.8), while the population younger than this will decline by 5%.

[5] Population born outside the EU-28 living in the EU27 in 2020.

Figure 6.8 Population pyramid in the EU, 2020-2040



Source: Eurostat [proj_19np]

The age structure also has an impact on the birth rate. As the younger generation gets older, the number of women of child-bearing age will diminish leading to fewer births. If the older generation is substantially larger than the younger generation, as in the case of the EU, the number of women of child-bearing age will decline as time goes on. The population aged 0-29 is smaller than that aged 30-59 in virtually all EU regions (Map 6.4). In regions in northern Spain and eastern Germany, the population aged 0-29 is at least 40% smaller than those aged 30-59. This suggest that the natural change in population will become increasingly negative in these regions and the share of population 65 and older will grow rapidly as compared with other EU regions.

Several of the Irish, French (including all the French outermost regions) and Nordic regions have a population aged 0-29 that is less than 10% smaller than those aged 30-59, which means they are likely to experience a slower reduction in population than in the regions with larger generation gaps.

Individual EU regions differ in one fundamental way from the EU as a whole. The age structure of the overall EU population can only be changed by migration from and to the rest of the world, while the age structure of an EU region is also affected by movements from and to other regions within the EU. The likelihood of these movements and their direction depend on people's age. People aged 20- 39 are more likely to move to an urban region and to leave a rural region. People aged 40- 64 and 65 and over tend to leave urban regions and move to intermediate or rural regions. This means that urban regions may grow by less than the present age structure suggests because older people move out and rural regions will shrink by less as older people move in.

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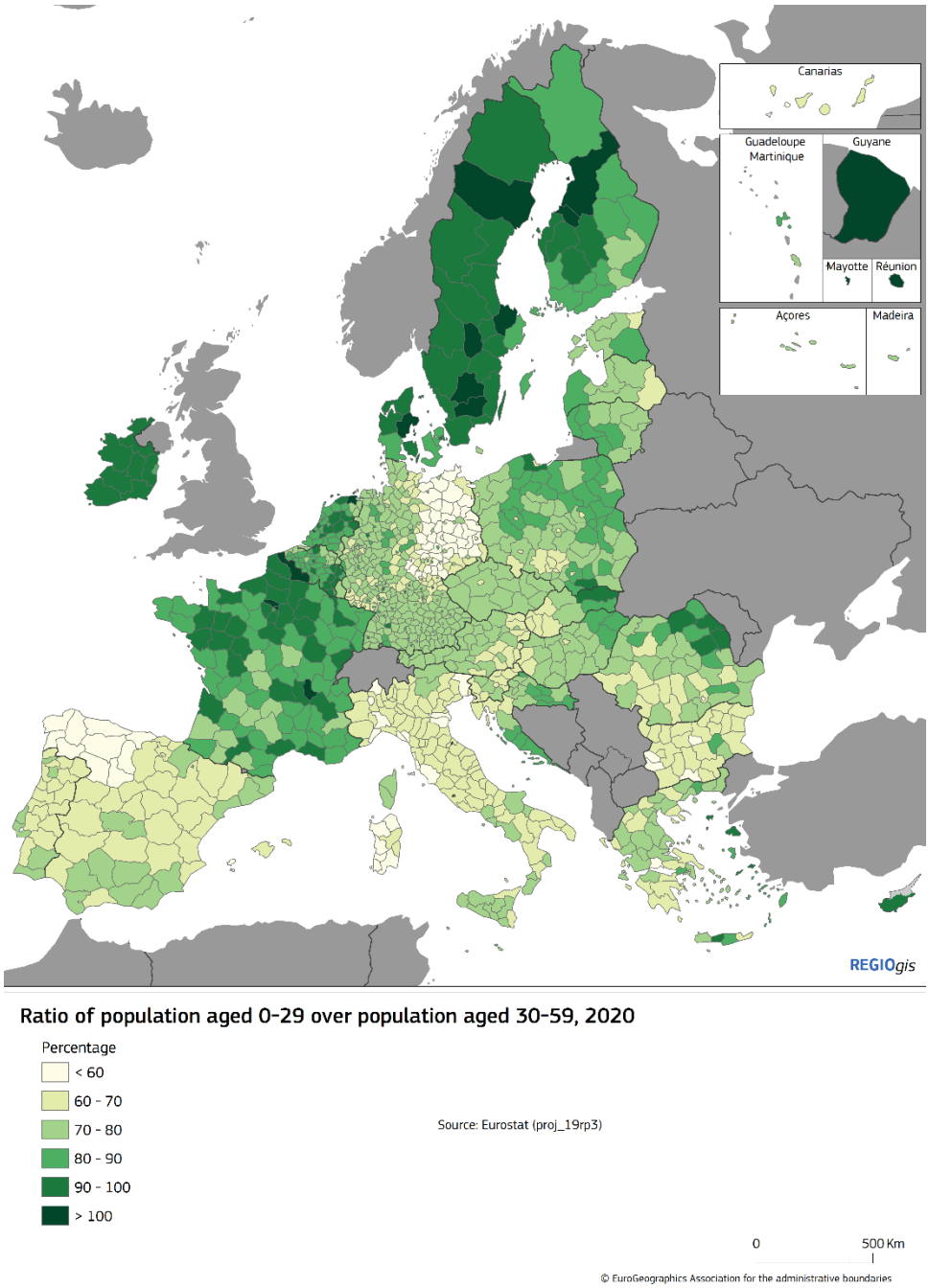
Map 6.4 Ratio of population aged 0-29 to population aged 30-59, 2020



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6.1.6 Older population is likely to grow, younger age groups to shrink

As EU population growth continues to slow down and starts shrinking as projected, some age groups will continue to grow. For example, virtually all EU regions will experience an increase of the population aged 65 and over. Only in a few regions in Bulgaria, Greece, Portugal and Romania is this age group projected to decline. In contrast, in many regions in Austria, Ireland, the Netherlands, Poland, Spain and Slovakia this age group is projected to grow by more than 25% over the next decade. This is likely to lead to an increase in the demand for healthcare in these

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regions, which will have to adapt their infrastructure and services to make them more accessible to people with limited mobility and increase the capacity of healthcare services.

Working age population (defined as those aged 20-64) is projected to shrink by 4% over the next decade. This is likely to affect most regions with some facing reductions of over 10%. This could lead to labour market shortages. It may force companies to choose between investing more in labour-saving and labour augmenting technologies or foregoing potential growth.

The age group 0-19 is projected to experience a slightly bigger reduction in the EU (of 5%), with many southern and eastern regions facing reductions of over 10%. By contrast, the number of young people is projected to grow in Cyprus, Malta and several regions in Germany and Sweden. Large reductions in the number of young people are likely to lead to a reduction of the number of schools, which may lead to longer distances to the closest school especially in rural areas where distances are already relatively long.

A recent OECD report highlighted that demographic change can widen territorial disparities in access to services. Population decline directly affects the provision of public services by shrinking the pool of potential users, which may force some facilities to close and increase the distance to services for the remaining users. School networks in many EU Member States face constant pressure to adapt to a declining number of pupils in rural areas. Smaller classes and fewer pupils per teacher in rural schools translate into higher costs: the report estimates that the difference in cost per student between cities and sparsely-populated rural areas in Europe is about EUR 650 and EUR 681 per primary and secondary school child.

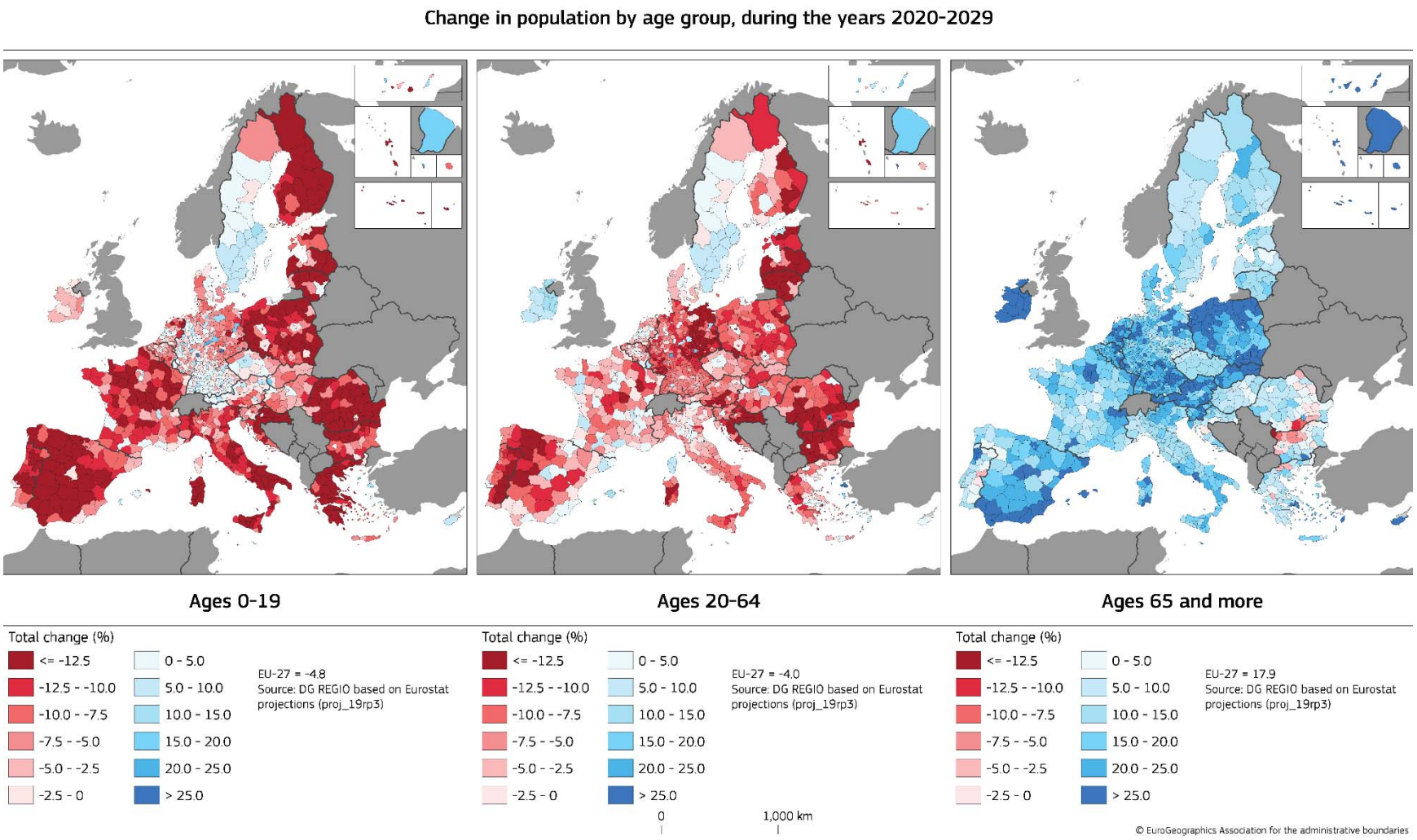
To remain efficient and equitable, school networks have to find scale economies wherever they can, while ensuring access to high quality education for all children. School consolidation, school clusters and networks can improve education quality while saving resources. The report estimates that children in sparsely-populated rural areas have to travel on average four to five times the distance that those in cities have to. This implies that some schools may continue to operate under capacity to ensure adequate access, especially for children who cannot travel far independently.

Providing healthcare services outside cities requires a delicate balance between accessibility and cost-efficiency. Countries may have service locations that are close or are cost-efficient, but no country can offer both short distances and low costs for these services.

Adapting to demographic change requires concentrating the provision of some services such as maternity and obstetrics that will face reduced demand in many countries, and expanding and dispersing the provision of services related to ageing, such as cardiology,, especially in rural areas. By 2035, the number of cardiology service locations per user is expected to increase on average by 20%, with the highest expected increases in Slovenia (88%), Ireland (71%) and Denmark (64%). In turn, the number of maternity and obstetrics service locations is expected to decrease by 4%, with the largest reductions in Latvia by (67%), Slovakia (56%) and Lithuania (44%). Investment will have to keep pace with these changing demands to avoid the over- and under-provision of services, while ensuring sufficient proximity to care.

See OECD, *Access and Cost of Education and Health Services: Preparing Regions for Demographic Change*. https://www.oecd.org/publications/access-and-cost-of-education-and-health-services-4ab69cf3-en.htm

Map 6.5 Change in population by age group, during the years 2020-2029



Demographic developments in EU outermost regions

The EU has nine outermost regions (grouped into eight NUTS 2 regions), with a total population of 5 million.* They are geographically remote from the continent in the Caribbean, Macaronesia and the Indian Ocean. These regions can be grouped according to the main demographic trends.

1. Outermost regions with a reduction of population

Portuguese Açores and Madeira, and French Guadeloupe and Martinique all experienced a reduction in population over the past decade (Table 6.4). Reductions were substantial in the two French regions, because a very high net outward migration offset positive natural change. In the Portuguese regions, reductions were more moderate due to net outward migration and low or negative natural change. Population reductions are projected to continue between 2020 and 2030. The age structure of the population in these regions is similar to the EU, the only significant exception is smaller share of older population in the Portuguese regions. Projections indicate that reduction of the young population (aged 0-19) will be much faster, the reduction in the working age population (aged 20-65) will also be faster, while the older population (aged 65 an over) will growth faster.

2. Outermost regions with a growing population and net outward migration

Guyane's population grew rapidly between 2010 and 2020 due to a very high natural change and only limited net outward migration. La Réunion's population grew more slowly due high natural change, but tempered by a substantial net outward migration. Projections indicate their population is likely to continue growing, but at slightly slower pace. Both regions have a much higher share of young people than the EU as a whole and a much smaller share of older population. The young and working age population is projected to shrink in La Réunion and to keep growing in Guyane. The older population is projected to nearly double in Guyane and increase by 50% in La Reunion.

3. Region with a growing population and net inward migration

The population of Canarias increased over the past decade primarily due to net inward migration, while the population of Mayotte grew to fastest due to the highest natural population change. The age structure of the population in the Canarias is similar to that of the entire EU, while that of Mayotte is radically different with more than half the population aged 0-19 and only 3% 65 and over. Projections indicate that Canarias will see a reduction of it is young population, but its working age and especially older population is likely to continue to grow. In Mayotte, all age groups are projected to grow, but its small older population is likely to grow fastest, doubling between 2020 and 2030.

Table 6.4 Demographic change in the outermost regions, 2010-2030

	Natural population change	Net-migration	Total population change	Total population change	Share of population 0-19	Share of population 20-64	Share of population 65 +	Change in population aged 0-19	Change in population aged 20-64	Change in population aged 65 +
	during the years 2010-2019			2020-2029	1/1/2020			Between 1/1/2020 and 1/1/2030		
	average annual change per 1000 residents				in %			Total change, in %		
EU-27	**-0.3**	**2.2**	**1.9**	**0.3**	**20**	**59**	**21**	-4.8	-4.0	18
Martinique	2.6	-11.1	-8.8	-8.8	22	56	23	-20	-20	30
Guadeloupe	4.5	-12.9	-8.4	-8.2	24	55	20	-19	-17	30
Região Autónoma da Madeira	-2.3	-2.5	-4.7	-3.7	19	64	17	-19	-7.4	28
Região Autónoma dos Açores	0.1	-1.8	-1.7	-2.6	22	63	15	-14	-6.6	31
La Réunion	11.7	-6.6	4.3	2.1	30	57	13	-7.8	-4.1	52
Guyane	26.6	-1.0	25.4	20.9	42	52	6	17	17	88
Canarias	0.8	8.5	9.3	9.6	18	65	17	-6.3	5.9	42
Mayotte	33.7	3.0	37.4	26.8	54	43	3	20	31	102

Note: Mayotte change during years 2014-2019 and Guadeloupe 2013-2019

Source: Eurostat demo_r_gind3 and proj_19rp3

* The 9 outermost regions (Saint-Martin is part of the NUTS 2 region of Guadeloupe) are governed by the provisions of the Treaties and form an integral part of the EU.

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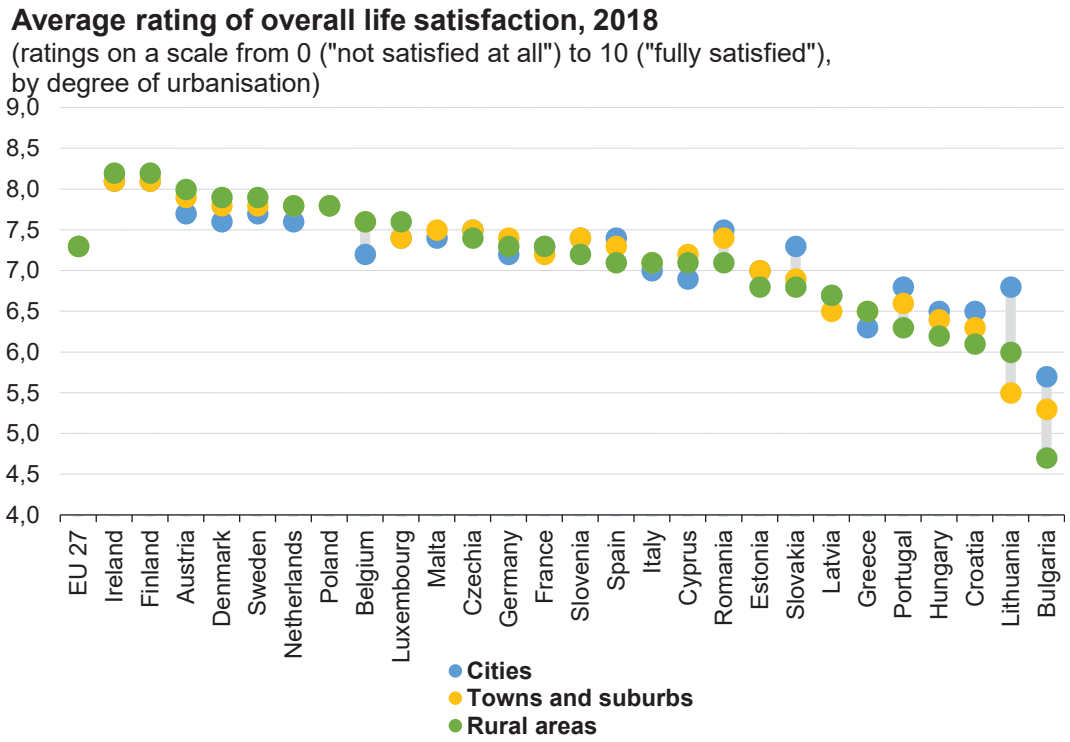
6.2 People are equally satisfied with life in cities, towns and suburbs, and rural areas

Overall life satisfaction in the EU is identical in cities, towns and suburbs, and rural areas. On a scale from 0 to 10, the average score was 7.3 in 2018 in each of these areas. In the 8 Member States with a national score of 7.5 or higher, people in rural areas were as satisfied as those living in cities or more than satisfied. In contrast, in 5 of the 6 Member States with the lowest national scores, people in rural areas were less satisfied than those in cities. This suggests that in countries with high life satisfaction, rural areas tend to perform better than cities, while in countries with a low life satisfaction, rural areas tend to perform worse.

There is also a geographic pattern. In all the north-western Member States, people in rural areas were more satisfied with their life than those in cities. In all eastern Member States, people in cities were more satisfied than those in rural areas; with the exception of Poland where they were equally satisfied. In the southern Member States, the situation was mixed with lower satisfaction in rural areas in Spain and Portugal, but higher satisfaction in cities in Greece and Italy

Figure 6.9 Overall life satisfaction, 2018



Source: Eurostat [ilc_pw02]

Job satisfaction (Figure 6.10) and satisfaction with personal relationships (Figure 6.11) are identical in cities, towns and suburbs, and rural areas at the EU level, and there are only minor differences in respect of satisfaction with their financial situation (Figure 6.12), with towns and suburbs scoring highest (6.6), followed by cities (6.5) and then rural areas (6.4).

For all three indicators, the same geographic pattern emerges. People in rural areas in north-western EU are more satisfied than those living in cities, those in rural areas in eastern EU are less satisfied, with very few exceptions, and the situation in the southern Member States is mixed.

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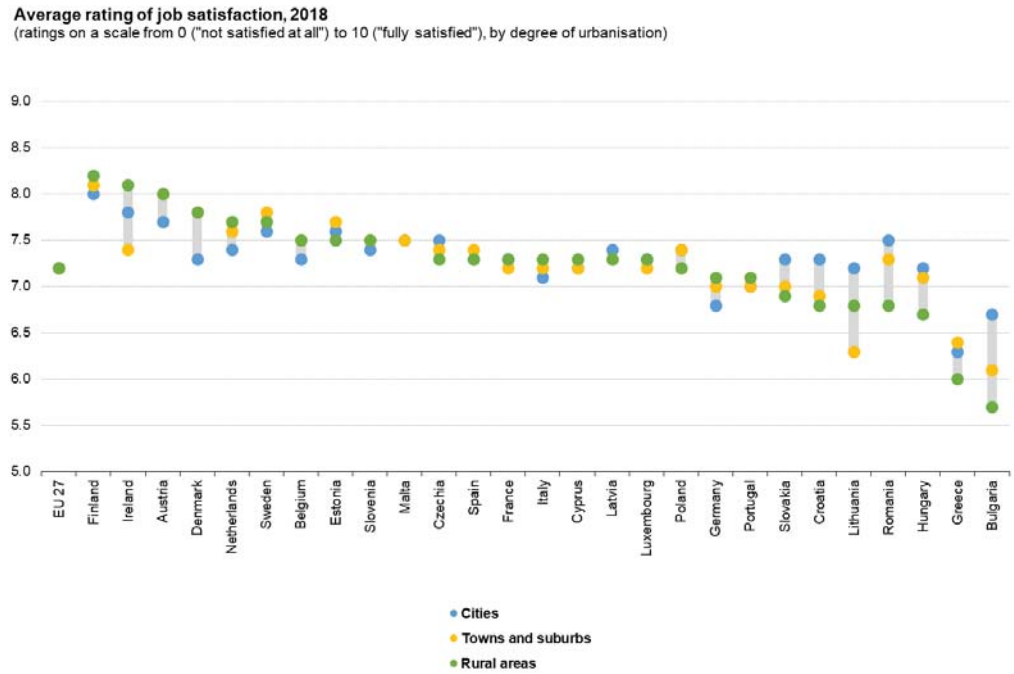
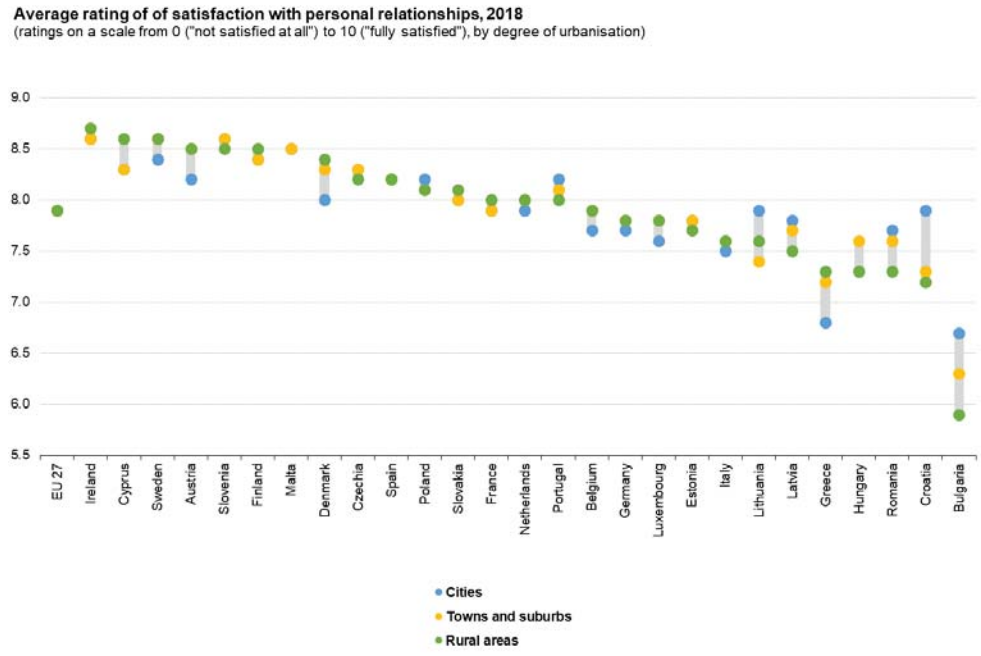
Figure 6.10 Average rating of job satisfaction, 2018



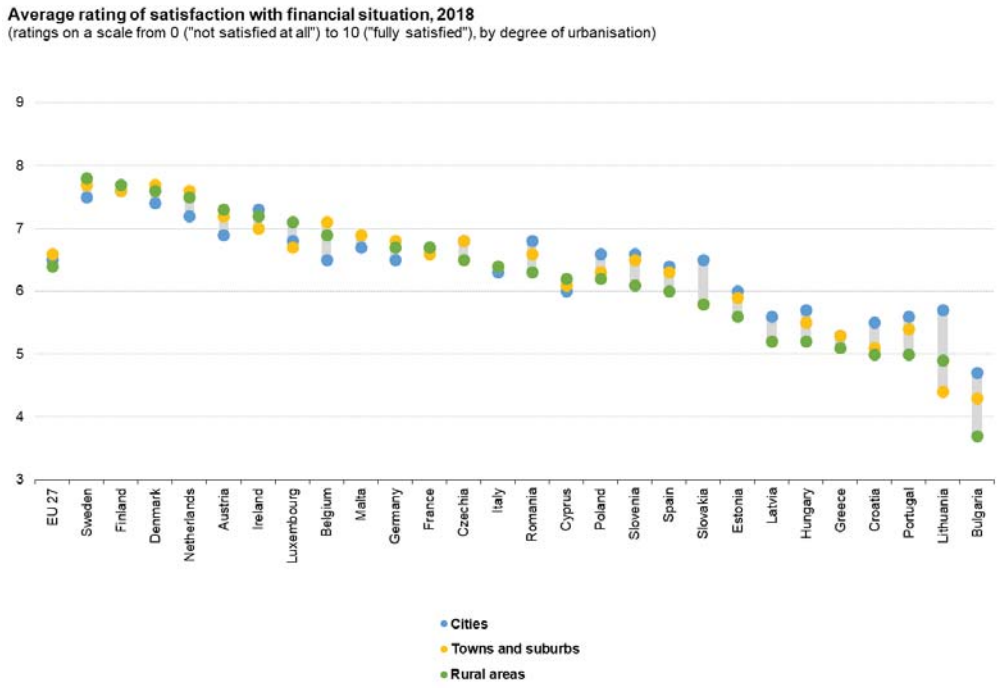
Source: Eurostat [ilc_pw02]

Figure 6.11 Average rating of satisfaction with personal relationships, 2018



Source: Eurostat [ilc_pw02]

Figure 6.12 Average rating of satisfaction with financial situation, 2018

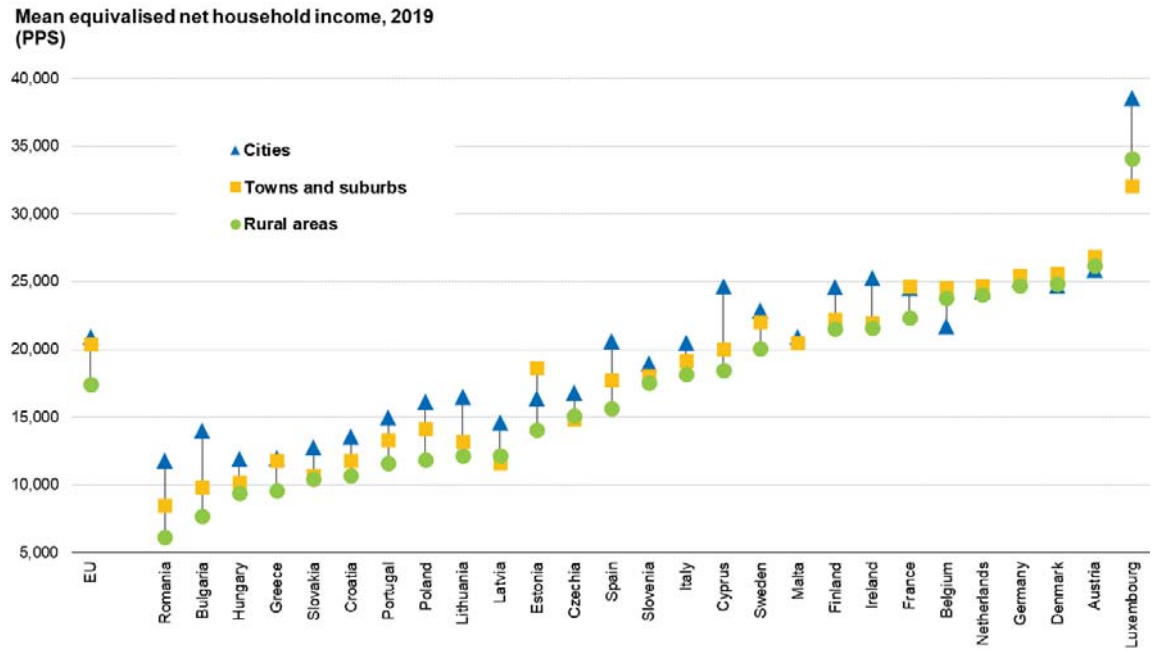


Source: Eurostat [ilc_pw02]

6.2.1 Income is higher in cities, but so are property prices

Income differs substantially between Member States and by degree of urbanisation. The lowest income is in rural areas in Romania (just over EUR 6 000 in PPS terms) and the highest in Luxembourg (EUR 39 000 in PPS terms). Unlike satisfaction with the financial situation (Figure 6.12), income is higher in cities than in rural areas in almost all Member States. The income gaps are largest in the eastern EU and especially in Romania and Bulgaria, where rural incomes are almost half those in cities (Figure 6.13).

Figure 6.13 Mean equivalised net household income, 2019



Source: Eurostat [ILC_DI17]

While there is some relationship between income and satisfaction with the household's financial situation, it is far from uniform. The link between income and satisfaction is strongest in rural areas (R squared of 61%). It is slightly less close in towns and suburbs (53%), and it is relatively weak in cities (36%). Higher housing costs in cities could explain why higher incomes do not lead to higher satisfaction. For example, the average price per square metre of housing sold in 2018 was 82% higher in urban regions across the EU than in rural ones (EUR 2 254 in the latter, EUR 1 238 Euro in the former according to data for 20 Member States, JRC). Moreover, between 2012 and 2018, the price per square meter increased by EUR 417 in urban regions but by only EUR 183 in rural ones, highlighting the pressure on urban real estate.

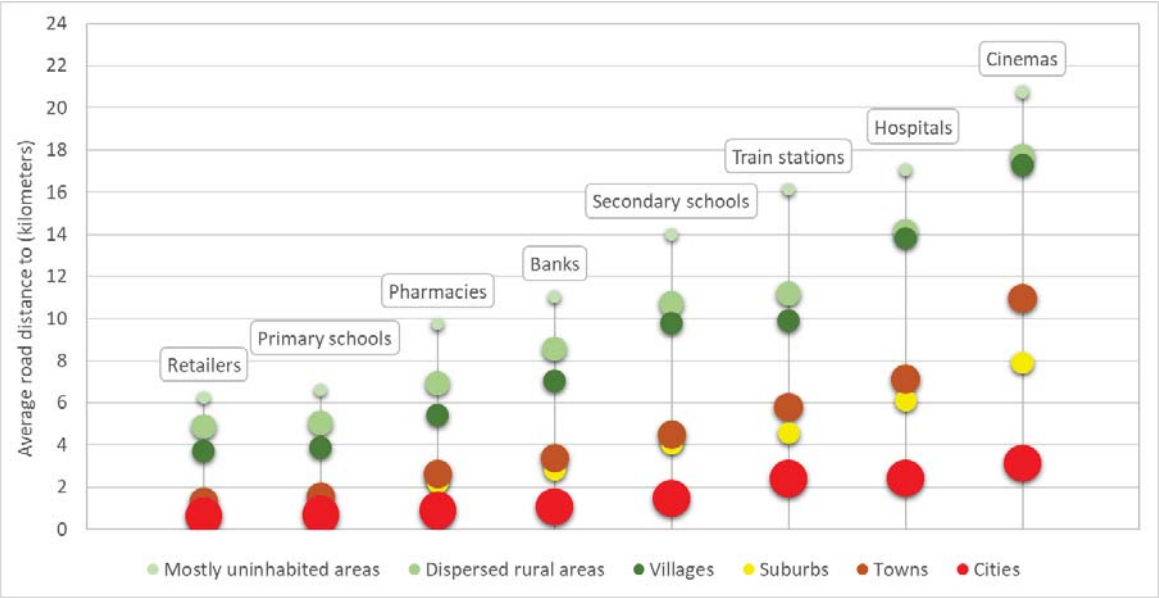
6.2.2 Rural residents need to travel further to reach services

In rural areas, settlements tend to be smaller and the population more dispersed. This means that often for services that require a certain volume of custom or number of users to be viable, rural resident may have to travel longer distances. Rural areas can be split into three categories.

1. Villages with population between 500 and 5 000 inhabitants
2. Dispersed rural areas, with a population density between 50 and 300 people per square km
3. Mostly uninhabited areas with a population density below 50 people per square km.

These three rural classes have a clear impact on the distance by road to the nearest service location. Services are on average located closer to villages and more distant in dispersed rural areas. Mostly uninhabited areas have consistently the longest distance to the nearest location (Figure 6.14). In cities, even relatively small ones, the average distance to most service locations is less than one or two km.

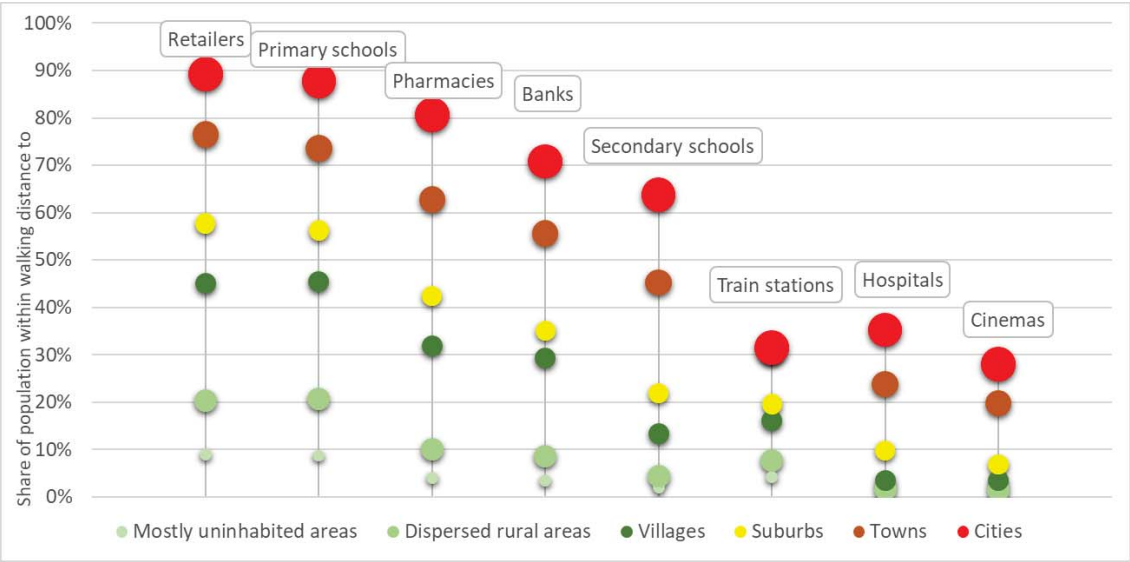
Figure 6.14 Average road distance to the nearest service location in the EU by degree of urbanisation, 2018



Source: Eurostat (hospitals), REGIO (stations) and ESPON Inner peripheries (other services), JRC-GEOSTAT for population and JRC calculations.

The share of population that could reach the nearest service location by walking or cycling, both involving zero carbon emissions, differs widely by degree of urbanisation. The nearest retailer is within walking distance (1.25 km) for 90% of city populations, compared to 75% of those living in towns, 45% of those in villages and 10% of those in mostly uninhabited areas. The more specialised the service or the greater number of potential clients needed, the less likely it becomes that someone can walk to the service. For example, only 65% of city populations live within walking distance of a secondary school and just 2% of people living in mostly uninhabited areas.

Figure 6.15 Population within walking distance of the nearest service location in the EU by degree urbanisation, 2018



Source: Eurostat (hospitals), REGIO (stations) and ESPON Inner peripheries (other services), JRC-GEOSTAT for population and JRC calculations

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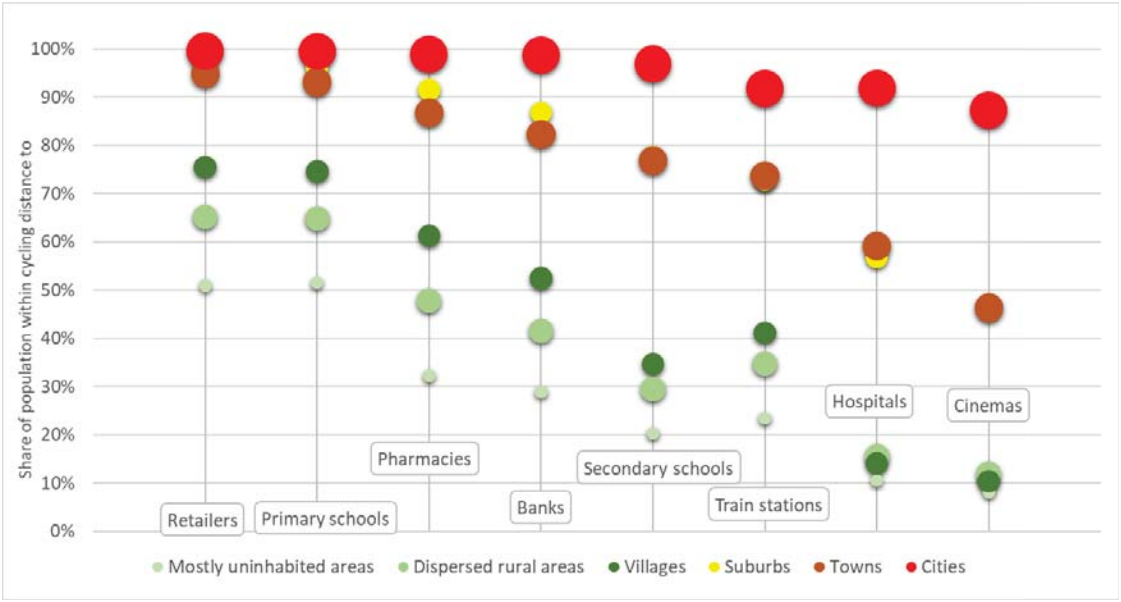
The population within cycling distance (5km) of the nearest service location is far larger. In cities, between 90% and 100% of the population are able to cycle to the nearest location of each type of service. The extent of the advantage of cycling over walking (in terms of the additional proportion of population that can reach their nearest service location) differs according to the service concerned and by degree of urbanisation. In rural areas, the advantage is most pronounced for less specialised services such as retail shops and primary schools, while in towns and cities, it is largest for the more specialised services such as secondary schools and hospitals. In suburbs, cycling increases the share of population that can reach all types of service by 40 pp. or more.

Figure 6.16 Population within cycling distance of the nearest service location in the EU by degree urbanisation, 2018



Source: Eurostat (hospitals), REGIO (stations) and ESPON Inner peripheries (other services), JRC-GEOSTAT for population and JRC calculations

The choice of walking or cycling to a particular destination does not only depend on the distance, but also on the quality and state of the infrastructure, the safety of roads, the weather, pollution, health and the presence of steep inclines and a person's health among many other factors. Nevertheless, the population within walking or cycling distance of the nearest service location provides an indication of where many people might be able to shift to a zero carbon mode of travel for these trips and where this not really a viable option. These figures suggest that in cities, towns and suburbs, cycling allows people to reach all these services within a reasonable amount of time. In rural areas, however, almost all residents need a car or public transport to reach more specialised services. Accordingly, rural residents are likely to drive longer distances and be more vulnerable to increases in the cost of car use.

6.2.3 Regional centres have more services

The presence of a service in a settlement depends on its population size and on whether it is a regional centre[6]. In general, larger settlements are more likely to have a range of services than smaller ones. For example, all cities with at least 250,000 inhabitants in the EU have a hospital,

[6] A regional centre is defined as being the largest settlement within a 45 minute car drive.

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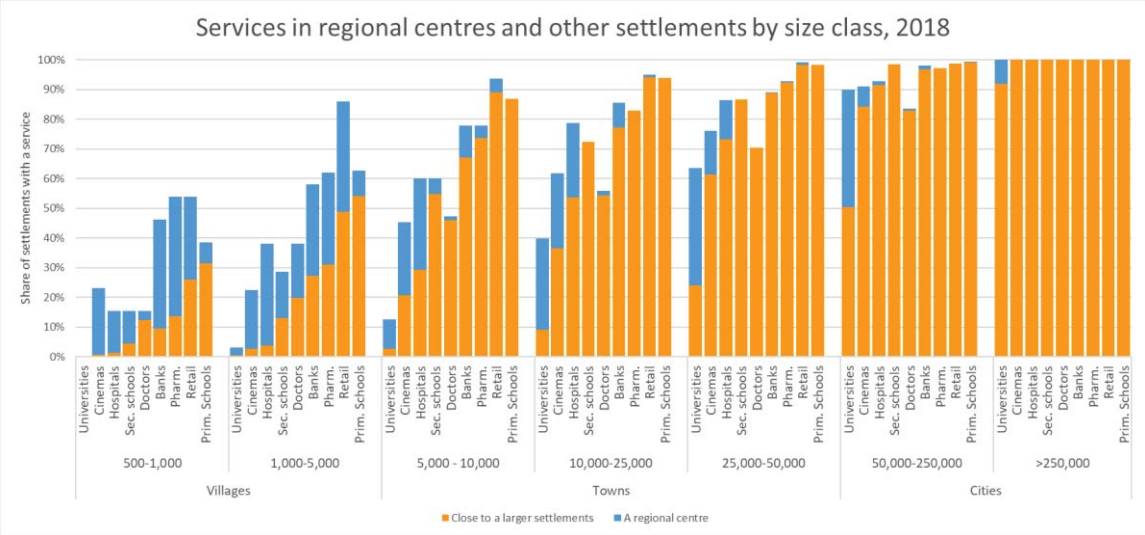
a secondary school and a cinema (Figure 6.17), while many towns and villages lack these services. Regional centres, or the largest settlement in a 45 minute drive, are more likely to have certain services than other settlements of the same size. For example, a small town surrounded by villages has more services than a small town close to a big city, because it provides services for its rural surroundings. Smaller settlements that are not regional centres, because they are close to a larger settlement, are less likely to have a range of services because they are available in the larger settlement.

For example, only 50% of the cities with between 50 thousand and 250 thousand inhabitants have a university, while 90% of the regional centres of this size have one. The smaller the settlement, the bigger the impact of being a regional centre. Towns and especially villages are far more likely to have a particular service if they are also a regional centre. For example, 60% of the towns with 5 to 10 thousand inhabitants that are regional centres have a hospital, while only 30% of the towns close to a larger settlement do. Villages that are regional centres are far more likely to have a doctor, a pharmacy, a bank, a secondary school, a hospital or a cinema than others.

Figure 6.17 Regional centres and other settlements with different kinds of service in the EU by population size class, 2018



Source: Eurostat (hospitals), REGIO (stations) and ESPON Inner peripheries (other services), JRC-GEOSTAT for population and JRC calculations

Compared to large cities, the number of services relative to population is typically larger in smaller cities and especially towns and villages. This implies that people living in the surrounding rural areas come to these places for these services. For example, the number of doctors relative to population is twice as large in towns and four times larger in villages than in large cities (Figure 6.18). This does not mean that people in towns and villages are more in need of doctors, but that many of the patients of the doctors live in the surrounding areas.

Relative to population, towns and villages have more shops, banks, schools, pharmacies, doctors, hospitals and cinemas than large cities do. This highlights the fact that towns and villages play an important role as a service centre and that the services there serve a wider population. Universities require a large population to draw their students from. As a result they are primarily based in large towns and cities. However, the significant number of universities in small cities

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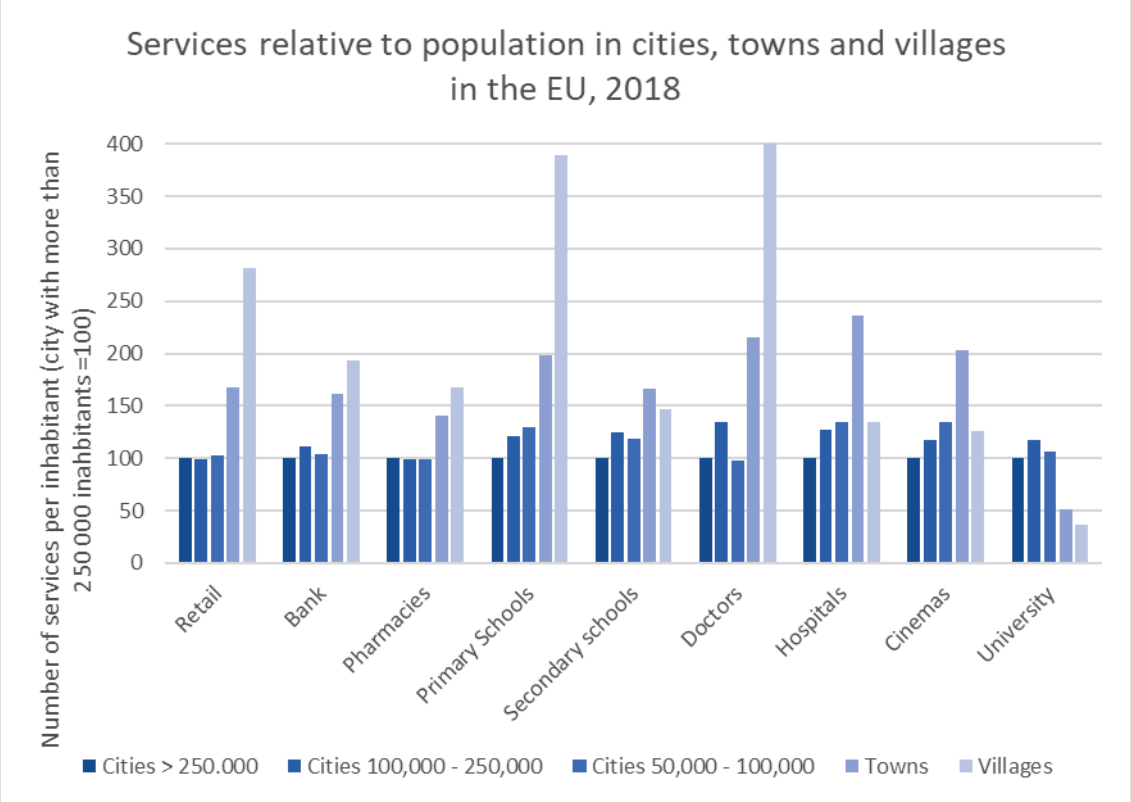
relative to population underlines the fact that their students come from a much wider area (Figure 6.17).

Regional centres can play an important economic and social role. They could become focal points for future investments and economic development as well as reducing the distances rural residents need to travel to access services of general economic interest.

Figure 6.18 Services relative to population in cities, towns and villages in the EU, 2018



Source: Eurostat (hospitals), REGIO (stations) and ESPON Inner peripheries (other services), JRC-GEOSTAT for population and JRC calculations

6.3 Rural residents are less likely to trust the EU

Rural residents are less supportive of the EU than city residents. Rural residents are less likely to trust in the EU or to be satisfied with the EU (Figure 6.19). This rural discontent is not directed at the EU only, but it is more pronounced than towards national or sub-national institutions. The gap between city and rural residents in terms of trust in their national government is smaller than for trust in the EU. Trust in local and regional governments, however, is higher in rural areas than cities, suggesting that rural residents are less likely to trust higher levels of government than those living in cities.

Although trust in the EU has increased over time (see chapter 7), the urban-rural divide has remained unchanged. On average, 56% of city resident in 2019 tended to trust the EU compared to 51% of rural residents. In 2015-16, these figures were both 9 pp lower, so the gap remained unchanged.

Satisfaction with national and EU democracy is lower in rural areas than in cities, with a marginally wider gap in respect of national democracy (3pp as against 2pp). Rural residents are less likely to think that their voice counts in their country or the EU, with a wider gap in respect

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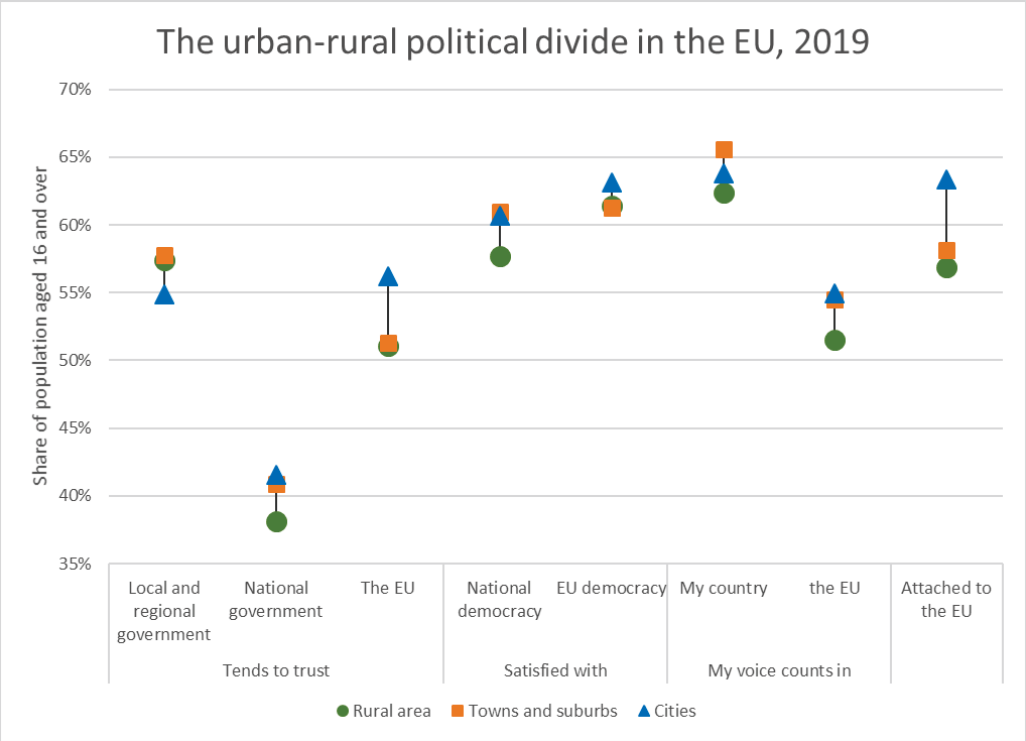
of the EU (3 pp as against 1pp). Fewer rural residents say that they are attached to the EU than city residents (6pp less), though many more living in both types of area are attached to their country or local area (93% as against 90%).

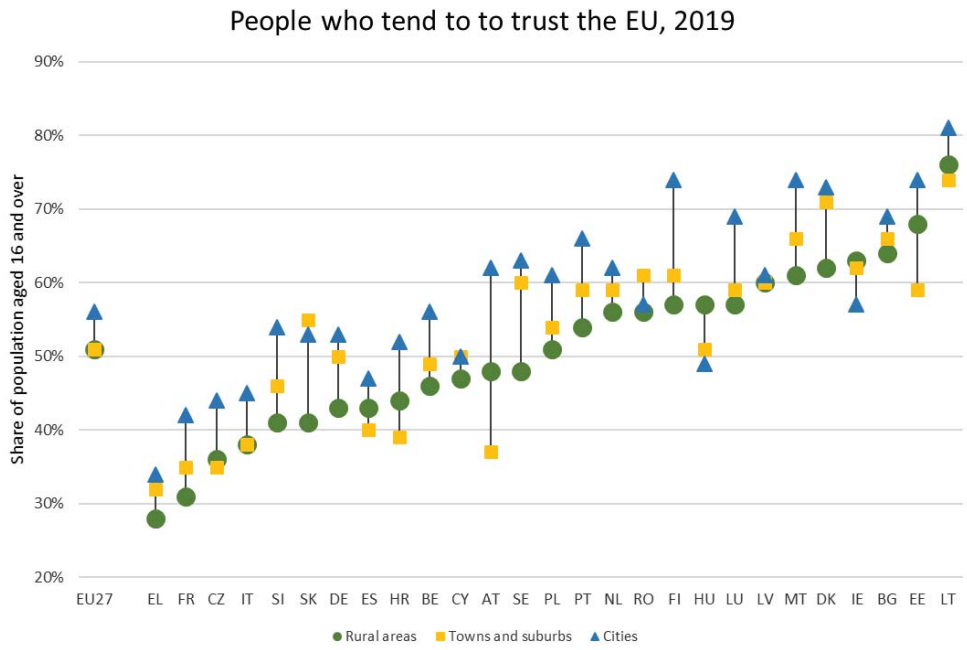
Figure 6.19 The urban-rural political divide in the EU, 2019



Source: Eurobarometer

This gap in trust in the EU between cities and rural areas is evident in almost all Member States (Figure 6.20), the only two exceptions being Hungary and Ireland. This is in contrast to satisfaction indicators, which are higher in rural areas than cities in north-western Member States and several southern Member States. In half the Member States, the gap in trust is 10 pp or more, with the largest gaps in Finland, Sweden and Austria.

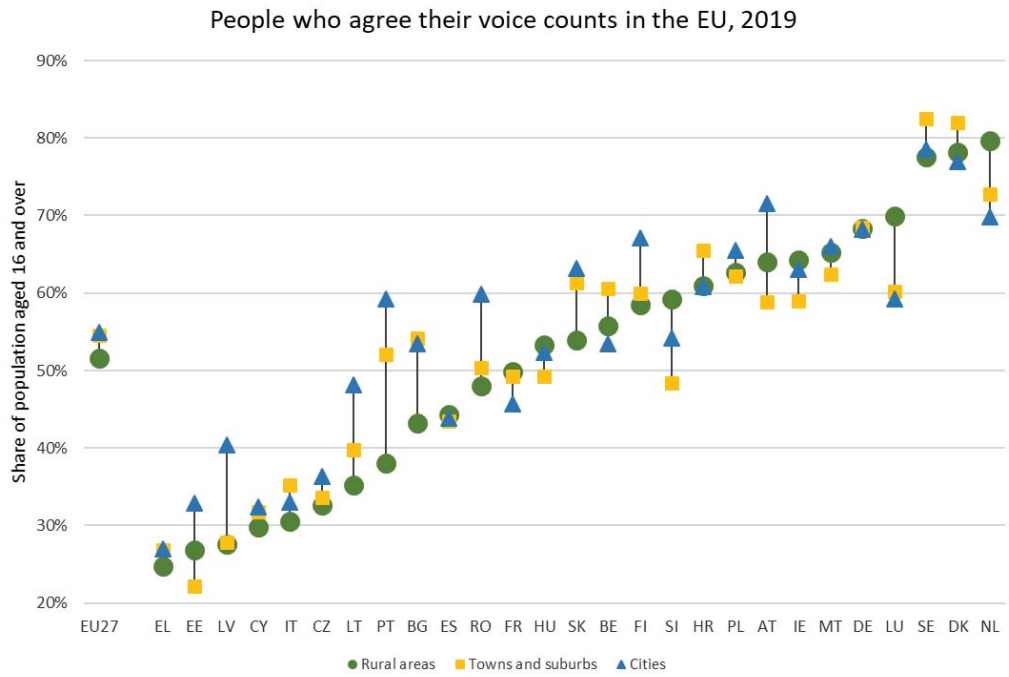
Figure 6.20 People who tend to trust the EU, 2019



Source: Eurobarometer

In the majority of Member States, as in the EU as a whole, rural residents were less likely to agree that their voice counted in the EU than those living in cities, the difference being over 10 pp in Bulgaria, Romania, Latvia, Lithuania and Portugal (Figure 6.21).

Figure 6.21 People who agree their voice counts in the EU, 2019



Source: Eurobarometer

A lack of trust, a conviction that your voice does not count, a frustration with democracy are all factors that can reduce voter turn-out at elections and polarise the vote.

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Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

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Chapter 7: Better Governance

Highlights

- The level of trust in national and local governments across the EU has increased over the past few years, including over the Covid-19 pandemic period, with local governments trusted more than national.
- According to the World Justice Project, rule of law standards are generally high in the EU, with eight countries ranked among the top 10 in the world, but performance varies across countries.
- People's perception of the quality of public services has been relatively consistent over the past decade with the north-western part of the EU performing better than the southern and eastern regions but with significant regional differences in some countries.
- Corruption remains a concern for Europeans. While people's perception of it varies widely between countries and regions, most Europeans think they can make a difference in combating corruption even where it is perceived to be most widespread.
- Public procurement procedures which involve only a single bidder or no calls for bids at all are potentially exposed to corruption. While the overall share of single bidder calls has increased in the EU over recent years, though not everywhere, procurement made with no calls has declined almost universally.
- Policy reforms have made the EU more business-friendly over recent years, as shown by the World Bank's 'Ease of doing business' assessment. The situation in cities in the same country, however, can differ markedly and it is rare for any one city to excel in all aspects of doing business.
- Over half of the EU adult population used the internet to interact with public authorities in 2020, but there are considerable differences between and within countries. In some regions, it is still the case that over 30% of people have never used a computer in their lives.

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1. Introduction

Public governance is the process of making and implementing government decisions[1]. Good governance requires well-functioning institutions and transparent procedures. Governments with high quality institutions, high levels of accountability and low levels of corruption tend to be better at providing public goods and services and creating a favourable environment for economic growth and social development[2]. Conversely, governments with low quality institutions tend to have a wide range of economic and social problems, lower levels of economic development, wider income inequality, a worse environmental situation and less electoral accountability. Recent worldwide studies have found that countries where corruption is high also tend to have fewer women in politics, poorer health performance, and lower levels of subjective well-being among the population[3].

GOOD GOVERNANCE AND ADIMINISTRATIVE CAPACITY[1]

A fundamental factor of good governance is good administrative capacity. This is defined as the ability of authorities to efficiently implement the policies they are responsible for. A high level of administrative capacity at all governance levels is important for managing and spending public funds effectively and is increasingly recognised as a key condition for ensuring investment performs well and contributes to the achievement of Cohesion policy objectives, especially in low income and low growth regions.

A recent European Policies Research Centre study[2] makes four sets of recommendations to strengthen administrative capacity and improve the use of technical assistance in the 2021-27 programming period:

1. Develop capacity-building roadmaps encompassing a broad range of activities, including support for human resources and organisational advice on systems and tools.
2. Support the entire ecosystem for managing and spending the funds, including implementing bodies, delivery agents and beneficiaries.
3. Develop flexible learning strategies for capacity building to respond quickly to changing circumstances.
4. Ensure coherent management of capacity building at EU level.

To facilitate the implementation of these recommendations in 2021-2027, capacity building to implement EU funds is financed by Member States' technical assistance. The new Common Provisions Regulation is intended to simplify and enable the strategic use of such assistance to develop administrative capacity as a long-term objective.

Beyond cohesion policy, administrative reforms and capacity building can also be funded by the newly established Recovery and Resilience Facility and the Technical Support Instrument, aimed at supporting sustainable economic and social convergence, resilience and recovery in response to the Covid19 pandemic.

[1] Source: Roadmaps for Administrative Capacity Building, Practical Toolkit. DG for Regional and Urban Policy, 2020 https://ec.europa.eu/regional_policy/sources/policy/how/improving-investment/roadmap_toolkit.pdf

[2] European Policies Research Centre (2020). *The use of technical assistance for administrative capacity building in the 2014-2020 period*. Luxembourg: Publications

To work well, institutions need high levels of administrative capacity that in turn enhance the effectiveness and transparency of public spending, including of EU funds (see Box). This chapter examines the most recently-published indicators for the EU on the quality of public institutions at the national and subnational level.

[1] 'Governance' in this chapter only covers public authorities.

[2] See Kaufmann et al. (1999); Charron and Lapuente (2013); Rodríguez-Pose and Garcilazo (2015); Annoni and Catalina Rubianes (2016); Pike et al. (2017).

[3] On health, see Holmberg and Rothstein (2011), Women in politics (Swamy et al 2001) and Well-being (Samanni and Holmberg 2010; Helliwell and Huang, 2008).

2. Monitoring and benchmarking the quality of institutions

2.1 Trust in national and local governments: recent trends

Transparency and accountability are two key prerequisites for high-quality governance. Open government policy-making and trust in public institutions reinforce each other. Open policy-making increases public satisfaction, fosters accountability and people's understanding of the processes involved, leading to increased trust in government. At the same time, trust is instrumental for active public involvement in policy-making (OECD, 2017).

Overall in the EU, trust in both national and local government has increased since 2013, but remains lower in national than in local governments. According to the latest figures, for 2021, just over half of the population (56%) trust their local government and fewer (38%) trust their national government (Figure 7.1). Trust in national government is lower than in local government in all countries. In France, the proportion trusting national government was over 30 pp less in most years. Except in Belgium and Austria, however, the proportion was larger in 2021 than in 2013 in all Member States, though the extent of the increase and the level in 2021 varies widely (Figure 7.1, top). The level of trust in national (and local) government has been consistently higher in Luxembourg than elsewhere, followed by the Nordic countries. The level in Greece in both 2013 and 2017 was among the lowest in the EU, with only 10% of people trusting their national government, though the proportion has risen to a third since. In Croatia, Slovenia, Bulgaria and Spain, trust in national government remains very low, though it has increased since 2013.

Notable features of trust in local government are the consistently high levels of trust in Germany (75% in 2021), the large increases in Ireland and Spain since 2013 (28 pp and 26 pp., respectively) and the low levels in Greece, Italy and Croatia, despite some increase in each case (Figure 7.1, bottom).

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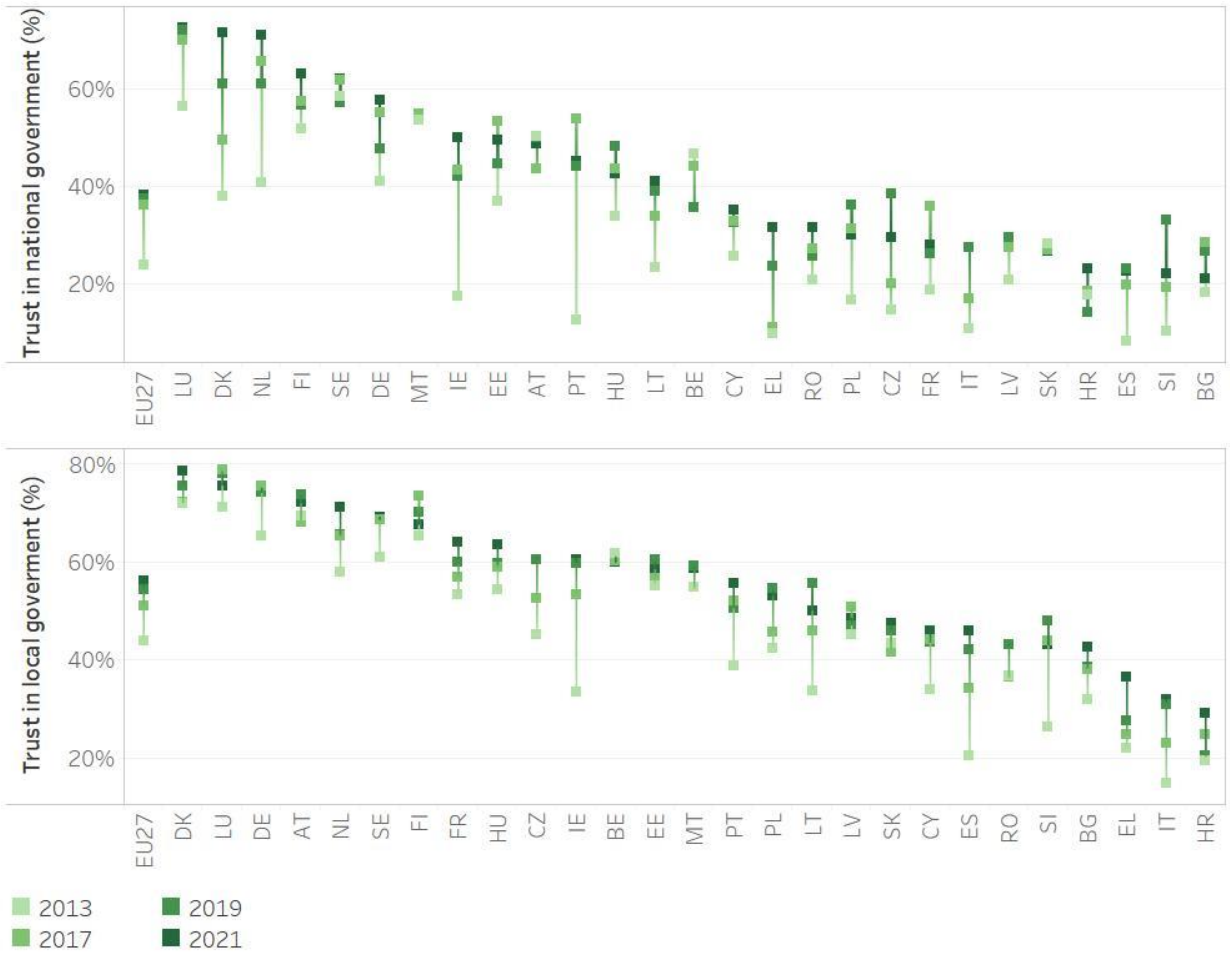
Figure 7. 1 Trust in national (top) and local government (bottom), 2013-2021



Note Countries ordered by 2021 values. Source: Standard Eurobarometer (EB), average of spring-summer and autumn-winter waves by year: EB79 and EB80 for 2013; EB87 and EB88 for 2017; EB91 and EB92 for 2019; EB93 and EB94 for 2021.

3. International indicators of the quality of institutions

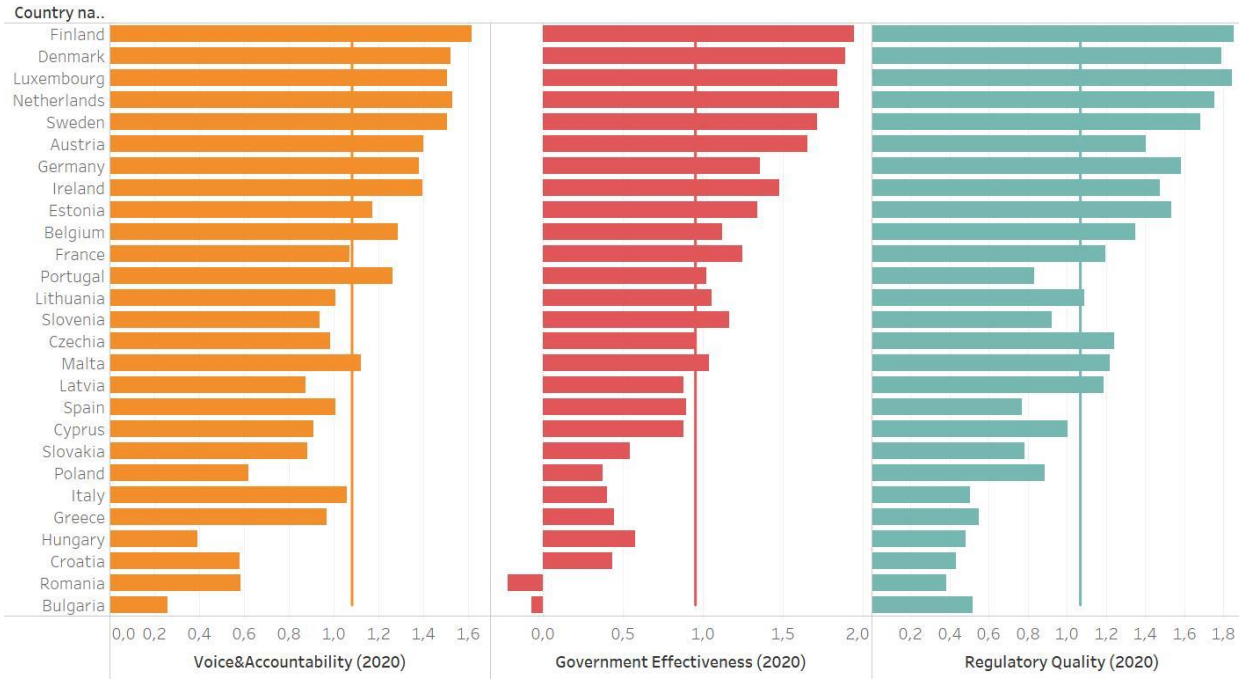
3.1 The World Governance Indicators

A wealth of measures of "good governance" have been developed over recent years. The World Bank in particular has established a measure of the quality of institutions through the Worldwide Governance Indicators (WGI), published for over 200 countries since 1996. Aggregate indicators have been developed for 6 dimensions of governance: Voice and accountability; Political stability and absence of

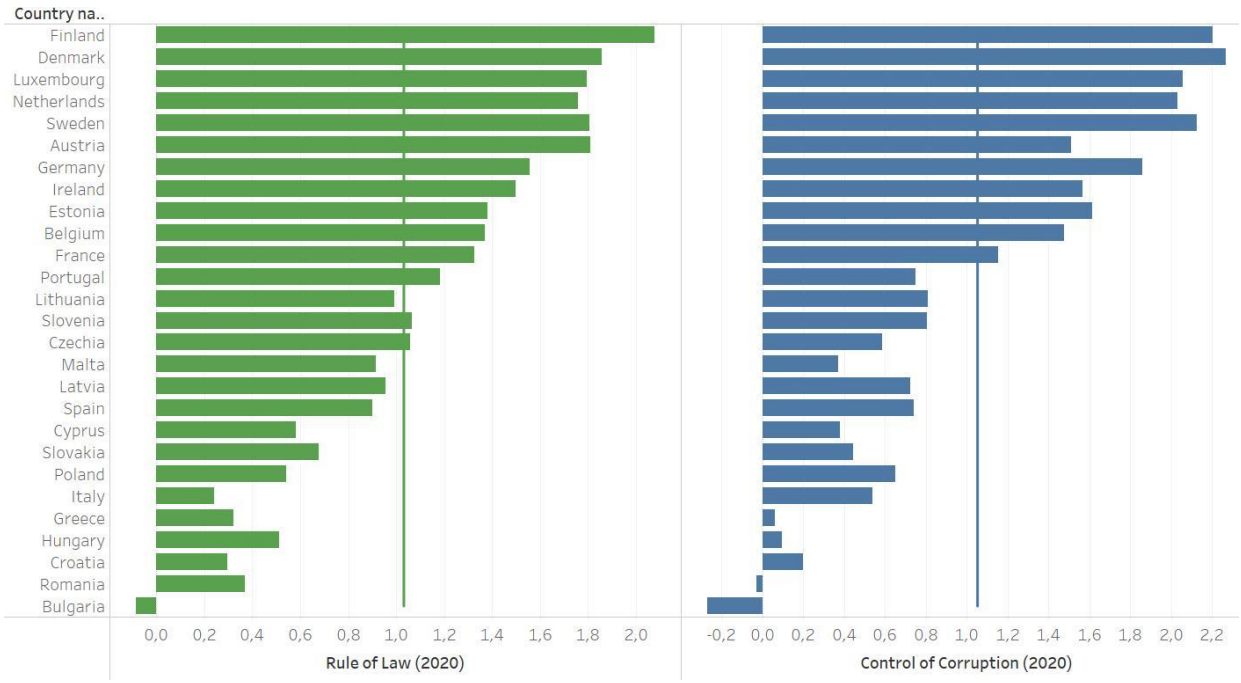
violence/terrorism; Government effectiveness; Regulatory quality; Rule of law and Control of corruption[4].

Nordic Member States together with the Netherlands, Luxembourg, Germany, Austria, Ireland, Estonia and Belgium are above the EU average on the 5 WGI dimensions considered here (i.e. excluding Political stability and absence of violence/terrorism which is less relevant in the EU context). Romania, Bulgaria, Hungary, Croatia, Greece, Italy, Spain, Cyprus, Poland and Slovakia are below the EU average on all 5 indicators (Figure 7.2). The Control of Corruption indicator varies most between countries. This is based on perceptions of the extent to which public power is exercised for private gain and includes both petty and grand forms of corruption, as well as the level of "state capture" by elites and private interests.

Figure 7. 2 Country performance on Five World Governance Indicator dimensions, 2020



[4] The six dimensions of governance described by the World Bank WGIs are described by aggregate indicators based on over 30 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organisations, international organisations, and private sector firms. A statistical model is used to construct a weighted average of the data from each source for each country. The composite measures of governance generated by the statistical model have a mean of zero (standard deviation = 1) and run from approximately -2.5 to 2.5, with higher values corresponding to better governance.



Note: The vertical line indicates the EU average, weighted by country population, for each dimension. Scores range from -2.5 (weak performance) to 2.5 (strong performance).The average across all the countries worldwide is 0 for each dimension. EU countries in almost all cases score above the worldwide average. Countries are ordered from best to worst according to their average score across the 5 dimensions.

Source: World Bank – World Governance Indicators, year 2020.

3.2 The World Justice Project's Rule of Law Index

The rule of law is an integral part of the democratic identity of the EU and an essential element for its functioning. While the EU is recognised as having high rule of law standards, promoting and upholding these standards requires constant monitor.

The World Justice Project (WJP)[5] produces a Rule of Law Index, which is the first attempt to systematically quantify and monitor the rule of law around the world over time. The Index is an aggregate indicator measuring the extent to which countries adhere to the rule of law in practice. The 2021 edition of the index covers 139 countries and jurisdictions and, for the first time, the entire territory of the EU. The index measures country adherence to the rule of law by looking at policy outcomes, such as whether people have access to courts and whether crime is effectively controlled. The index construction relies on national surveys of households and experts to measure how the rule of

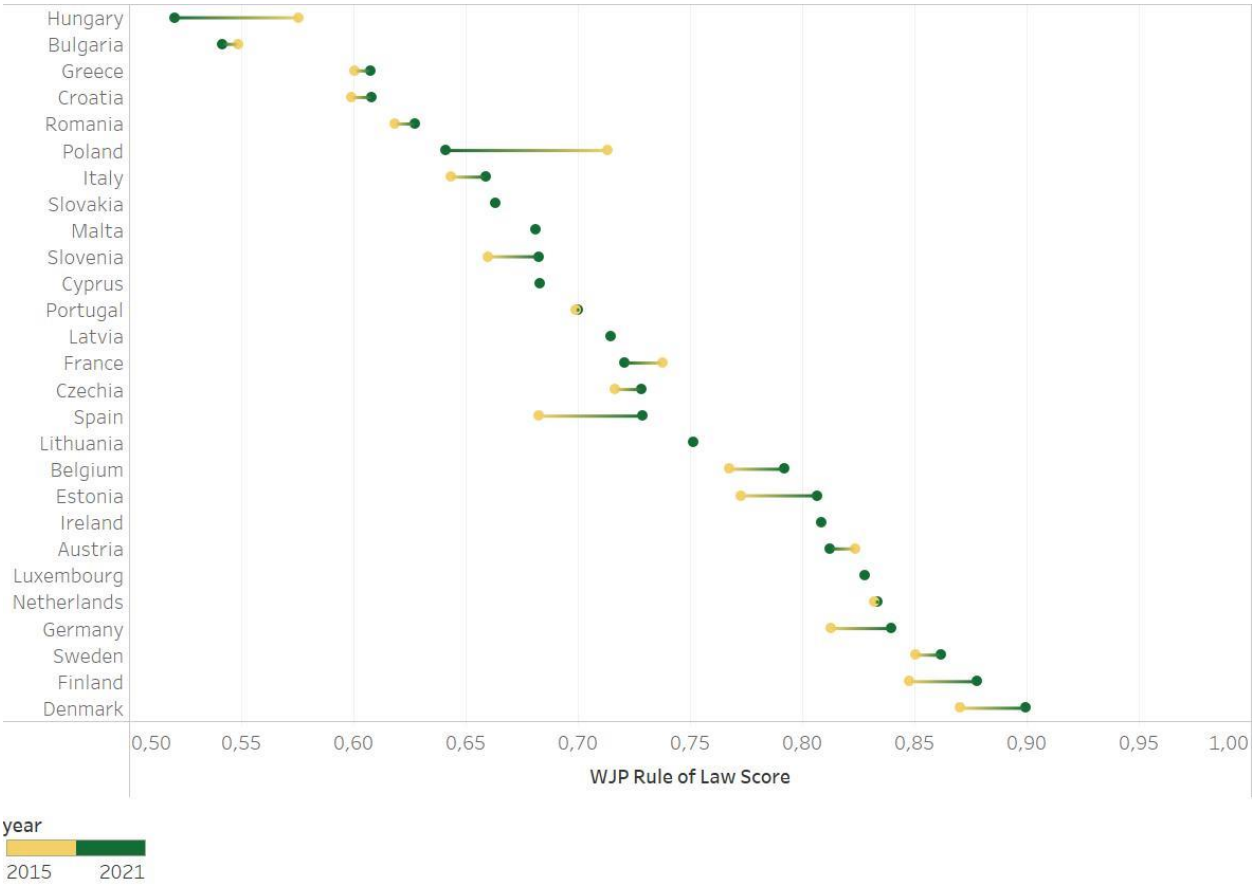
[5] https://worldjusticeproject.org/our-work/research-and-data/wjp-rule-law-index-2021

law is experienced and perceived. It includes eight components describing the multi-faceted concept of rule of law: 1. Constraints on government powers, 2. Absence of corruption, 3. Open government, 4. Fundamental rights, 5. Order and security, 6. Regulatory enforcement, 7. Civil justice and 8. Criminal justice[6].

According to the 2021 results, all the EU countries score above 50% of the maximum ideal score of 1, indicating that rule of law standards are overall good relative to countries in the rest of the world (Figure 7.3). According to the latest figures, the EU is home to three of the four highest scoring countries in the world, Denmark (in 1st place), Finland (3rd) and Sweden (4th), and there are another 5 Member States in the top 10 - Germany (5th), the Netherlands (6th), Luxembourg (8th), Austria (9th) and Ireland (10th). The weakest EU countries in terms of the index are Greece (ranked 48 out of 139 worldwide), Bulgaria (62)) and Hungary (69). According to the index, almost all the countries for which a time series is available have slightly improved their rule of law since 2015[7], with the exception of Austria, Bulgaria and France, and, most especially, Hungary and Poland, whose score decreased by 8 points over these 6 years (Figure 7.3).

[6] Indicators included in the Rule of Law index are normalised using the min-max method with a base year of 2015. The overall score is computed as the unweighted average of the 8 component scores. All the scores are on a 0 (worst) to 1 (best) scale.
[7] Comparisons are made with 2015 as the reference year as according to the methodological notes on the Rule of Law Index by the WJP scores are not strictly comparable before then.

Figure 7. 3 Rule of Law Index score (World Justice Project), 2015 and 2021



Note: Countries are ordered according to their 2021 score. CY, IE, LV, LT, MT, SK: no data available before 2021. Scores go from a minimum of 0 (weakest adherence to the rule of law) to a maximum of 1 (strongest adherence to the rule of law).

The 'Constraints on government powers' component measures, for example, whether government powers are limited by the legislature, the judiciary or independent auditing and whether government officials are sanctioned for misconduct. , Hungary scores 0.39 on this measure, the lowest score in the EU on this and any other component (Figure 7.4), Its score on 'Order and security', however, is considerably higher (0.90) and in line with the other EU countries. The performance of Croatia also varies a lot, from 0.49 on 'Criminal justice' (which measures whether the criminal investigation system is timely, impartial and free of corruption) to 0.85 on 'Order and security'. Slovenia, Malta, Slovakia, Poland, Romania and Bulgaria also show variable performance across the components, with differences between the highest and the lowest scores of over 30 points. In general, countries scoring

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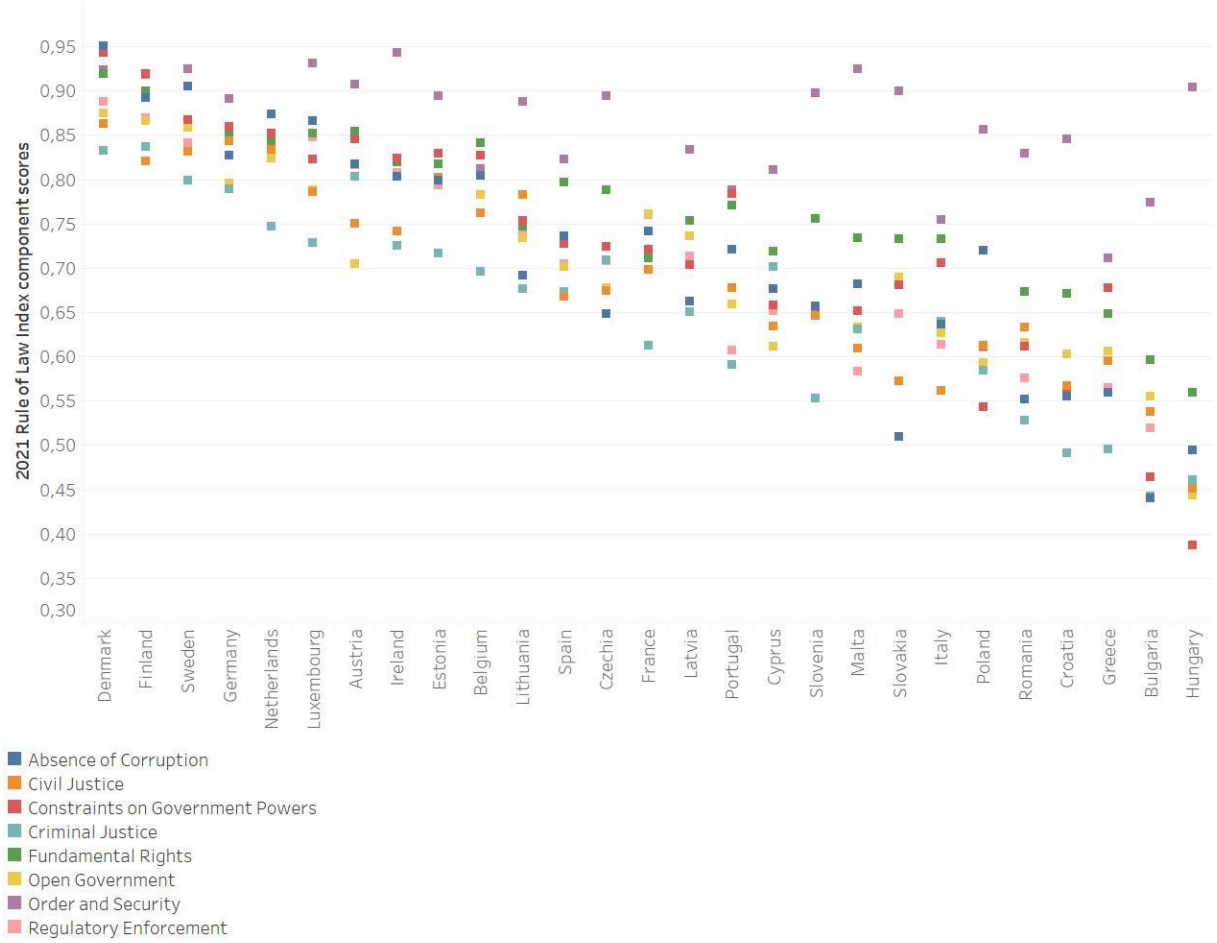
highest on the overall index have a relatively similar performance across the different components, while performance tends to vary more for countries with relatively low overall scores.

It is interesting to note that the highest scores for most of EU countries are on 'Order and security', which measures whether crime is effectively controlled, people are protected from armed conflict and terrorism and violence is not used to redress personal grievances. This shows that the EU is a relatively safe place to live.

Figure 7. 4 2021 Rule of Law Index component scores.



Note: Countries are ordered according to their overall Rule of Law score. Scores go from a minimum of 0 (weakest adherence to the rule of law) to a maximum of 1 (strongest adherence to the rule of law).

It should also be noted that, since 2020, the European C omission has established the European Rule of Law Mechanism to stimulate inter-institutional cooperation and encourage all EU institutions to engage in dialogue on the issue. The Rule of Law annual reports are at the basis of this new process

and are intended to be a preventive tool. They are based on in-depth, country-specific qualitative assessments of different aspects of the rule of law in EU countries and, as such, provide a different, complementary analysis to that of the WJP Rule of Law index.

3.3 The European Quality of Government Index

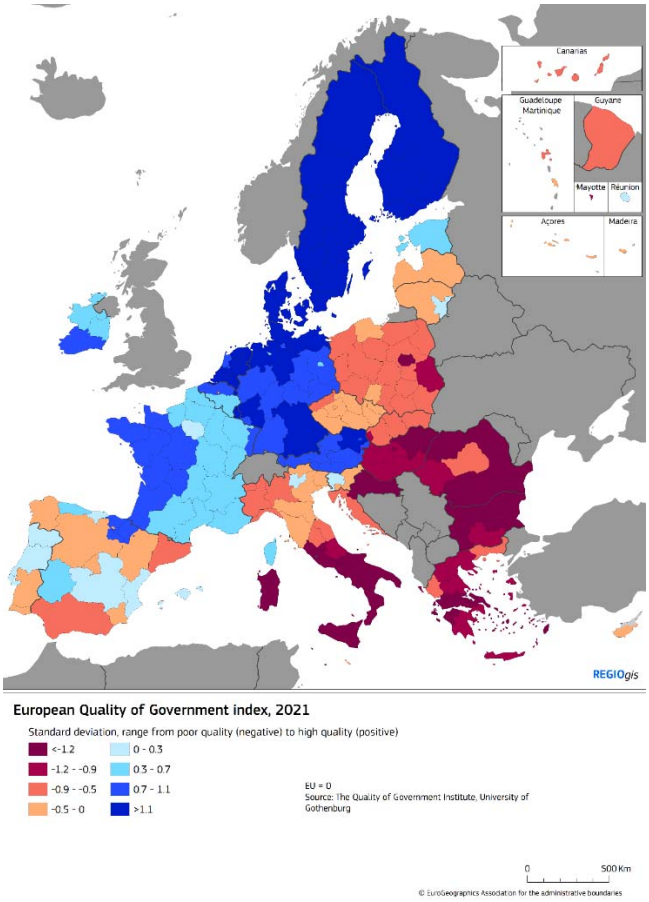
Over the past two decades, a surge of research has been devoted to assessing the quality of institutions across and, more recently within, countries, focusing on corruption, the impartial application of the rule of law and the effectiveness of public bureaucracy. The European Quality of Government Index (EQI) has been published four times since 2010 at the regional level[8] and has had a wide impact on research on economic geography, entrepreneurship and innovation in EU regions. Based on a survey at regional level together with national estimates from the World Governance Indicators[9], the EQI measures three comparable aspects of the quality of government in EU regions.

The EQI survey questions are based on a conceptual framework in which the quality of government is considered as a broad, multi-dimensional concept involving impartial and high quality service delivery and low corruption. Questions are aimed at capturing people's perceptions and experience of corruption and the extent to which they rate public services as impartial and of good quality in their region of residence. The focus is on policy areas that are most often managed at the sub-national level, such as education, healthcare and law enforcement. The questions are centred on three core domains of the EQI, 'corruption', 'quality' and 'impartiality' in respect of the services concerned. The EQI is the first measure to enable governance in EU regions within and across countries to be compared[10].

The 2021 picture is rather consistent with previous editions of the EQI, with the north western area performing better than the southern and eastern part of the EU (Map 7.1). There are significant regional differences in some countries – in Italy, Spain, Belgium, Ireland, Poland, France, including its overseas regions, and Slovenia, in particular – but very little in others, in the Nordic countries, especially.

[8] Charron et al. (2019).
[9] https://databank.worldbank.org/source/worldwide-governance-indicators
[10] The EQI scores are computed as simple, equal-weighting averages of normalised survey scores. The normalisation used is z-score, that is a measurement of the relationship of the regional score to the EU average, measured in terms of standard deviations from the mean. If a z-score is 1, it indicates that the data point's score is one standard deviation above the EU average. Positive values show higher than EU-mean score; negative values are lower than the EU-mean score.

Map 7.1: The European Quality of Government index (EQI), 2021.



Note: Scores are expressed in z-scores, EU average is therefore equal to 0. Positive (negative) values reflect higher (lower) than the EU average quality of government.

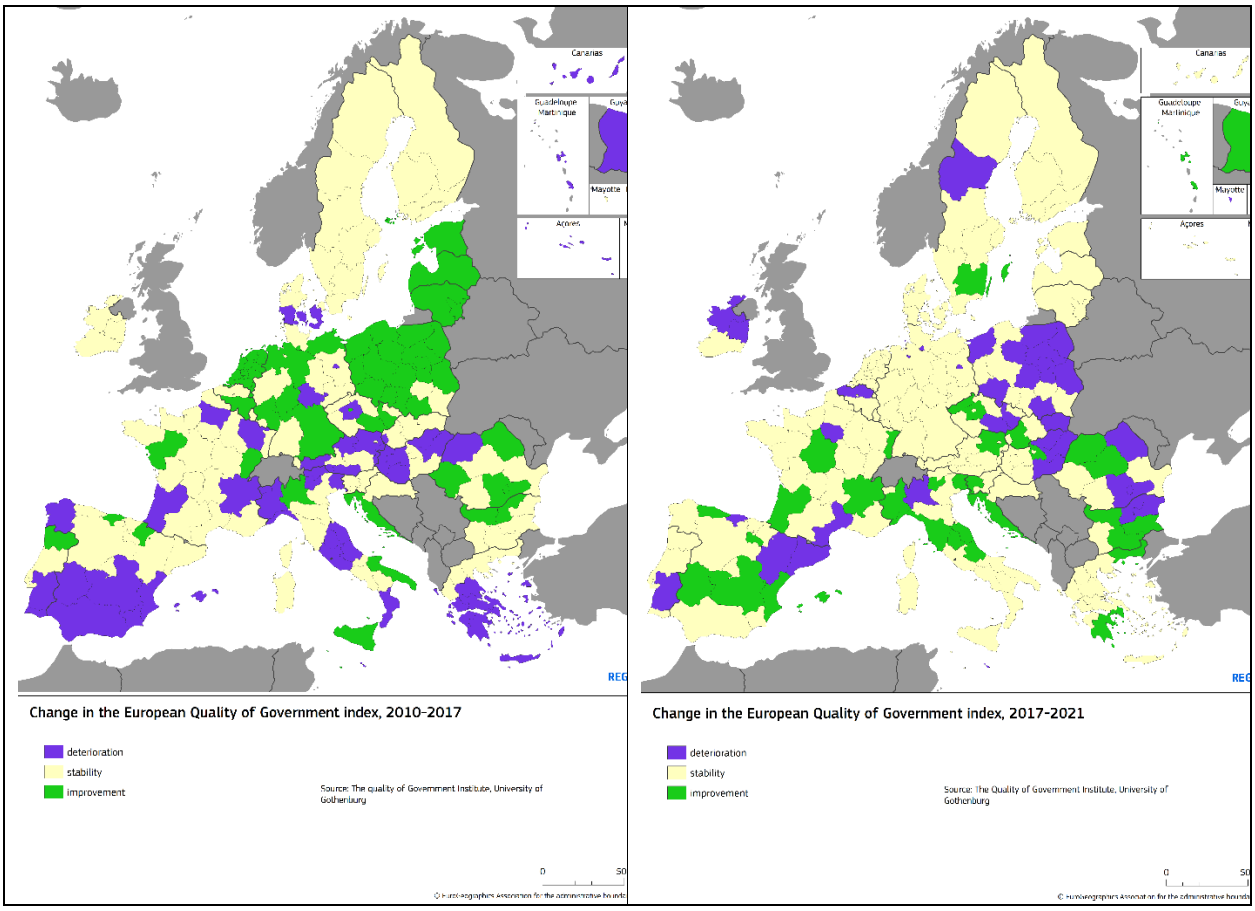
Source: The Quality of Government Institute, University of Gothenburg[11].

Over the period 2010-2017 (Map 7.2, left-hand side), there were significant improvements in the quality of government in the Baltic countries, most of Poland and Germany, the Netherlands, Croatia and some regions in Romania and Bulgaria. By contrast, there was a deterioration between 2010 and 2017 in Austria, Hungary, southern Greece, Cyprus, the southern part of Spain and some regions in Portugal and Italy. Between 2017 and 2021, however, the index stabilised in the Baltic countries (Map 7.2, right-hand side) [12] and worsened in most Polish regions, especially in the east of the country. The

[11] All countries at the NUTS2 level except Belgium and Germany, which are at the NUTS1 level.
[12] Because of changes in the NUTS2 classification in Ireland and Lithuania, regional values for these countries in 2021 are compared with national ones in previous editions.

same is the case the eastern part of Romania, where the capital city region of Bucuresti-Ilfov, had the lowest score in the EU in 2021. On the other hand, there was some improvement in the index over this period in the south of Spain, southern Germany, southern Greece and the south and central parts of Italy.

Map 7.2: Changes in the regional EQI, 2010 to 2017 (left) and 2017-2021 (right).



Note: Regions where scores increased (decreased) by more than 0.25 standard deviations in the period are shown on green (purple).

Source: DG REGIO based on data by the Quality of Government Institute, University of Gothenburg.

On average, less developed regions score significantly below the EU average in all the years of the EQI. The average EQI is higher for transition and more developed regions but with more variability (Table 7.1).

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Table 7.1: Average EQI scores by category of region, 2010-2021

	year			
Region category	2010	2013	2017	2021
Less developed	-0.90	-0.84	-0.83	-0.88
Transition	0.42	0.30	0.27	0.36
More developed	0.58	0.62	0.64	0.62

Note: All years (EU average = 0). Source: DG REGIO based on data from the Quality of Government Institute, University of Gothenburg.

4. Corruption

Corruption hampers a government's ability to foster economic growth and improve people's well-being[13]. No country is free from corruption but the extent varies greatly across the EU. Moreover, in some EU Member States people's perception of corruption in their national government varies quite substantially within the country, such as in Hungary, Italy and Portugal (Map 7.3).

[13] See for example Pak Hung Mo (2001) Corruption and Economic Growth. *Journal of Comparative Economics* (29), 66–79.

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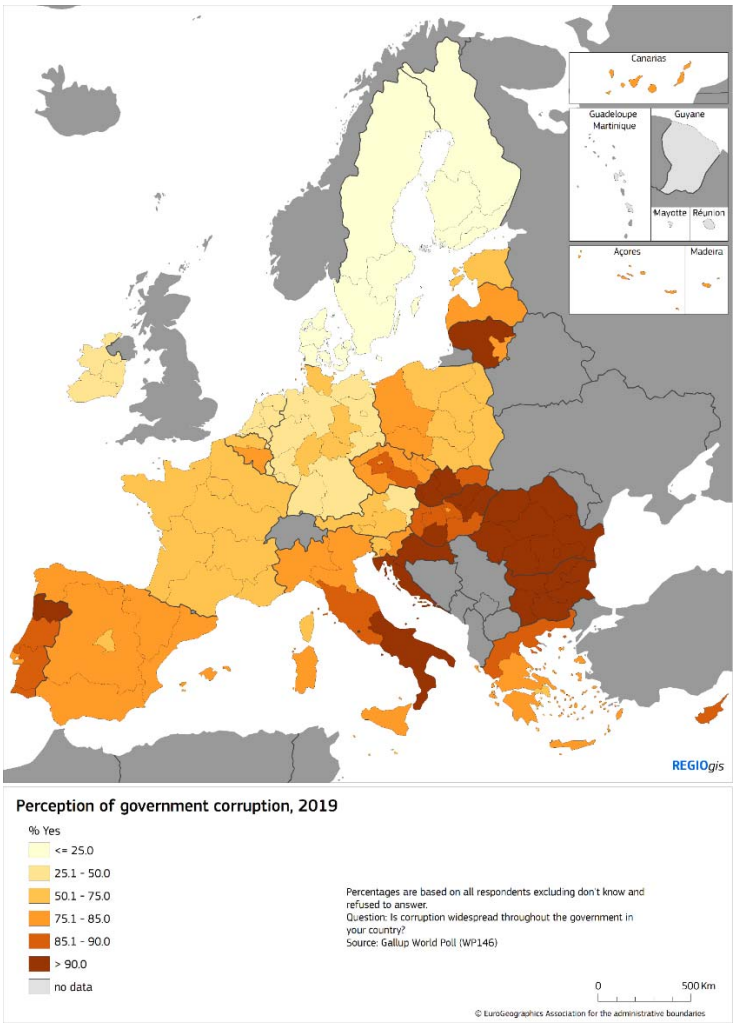
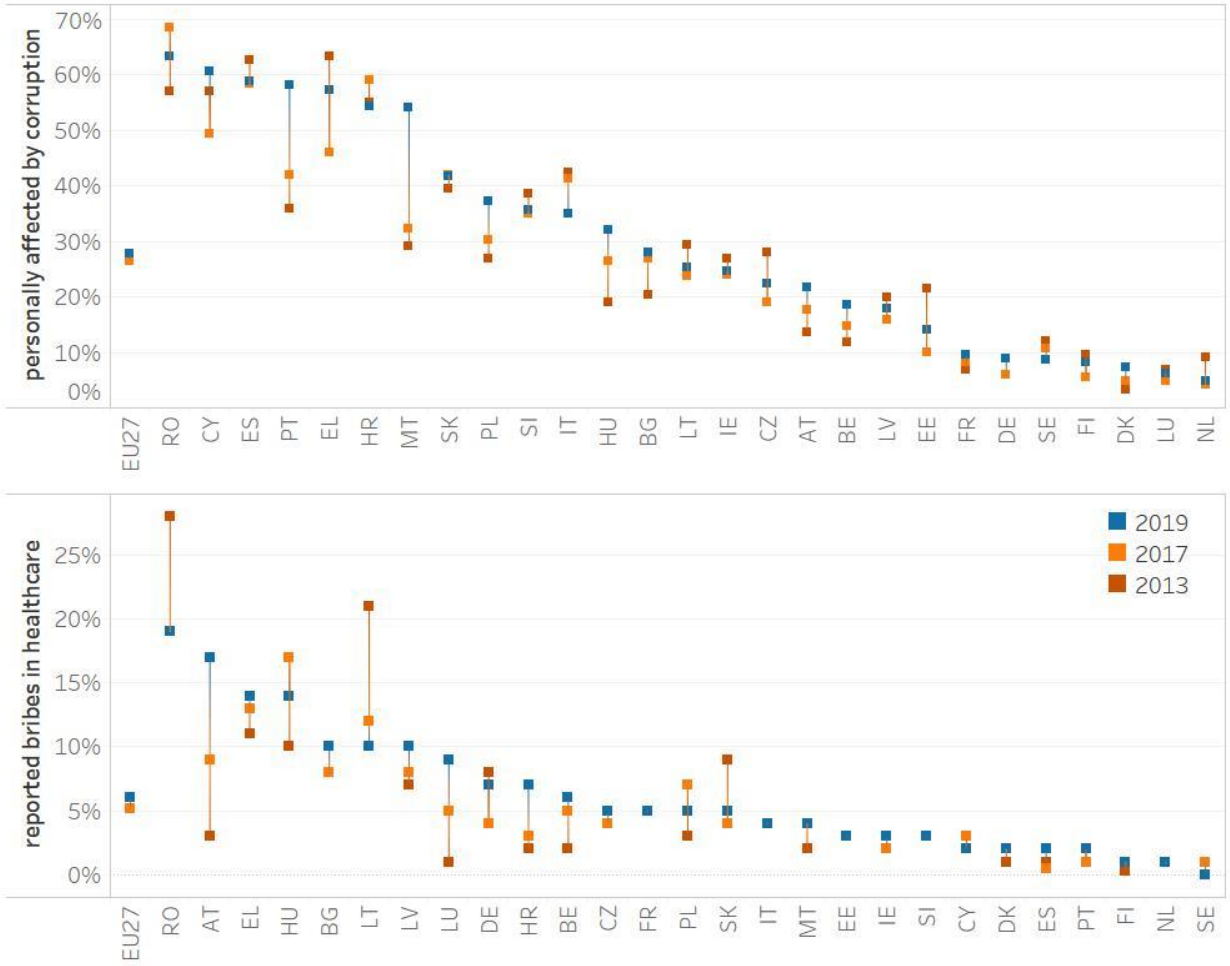
Map 7.3: Perception of corruption in national government. Source: Gallup, ad-hoc regional EU survey, 2020[14]



In 2019, 28% of people surveyed in the EU reported being somehow personally affected by corruption in their daily lives (Figure 7.5, top), the proportion being marginally larger than in 2013. In 7 countries (Romania, Cyprus, Spain, Portugal, Greece, Croatia and Malta), over half of respondents reported being affected, with the largest increases from 2013 (of around 30 pp or more) being in Portugal and Malta. By contrast, in the Nordic Member States, Germany, Luxembourg and the Netherlands, less than 10% respondents reported being personally affected by corruption in 2019, much the same as in 2013.

[14] NUTS2 for all the countries except for AT, BE, FR, DE, EL, IT, NL, PL, ES, SE, that are at the NUTS1.

Figure 7. 5 Personal experience of corruption in one's daily life (top) and in healthcare (bottom), 2013-2019



Note: Change from 2013. Countries ordered by 2019 values. Source: Special Eurobarometer on corruption: EB396 2013; EB470 2017; EB502 2019.

The public healthcare system is the most frequently mentioned by those reporting being affected by corruption in 2019[15]. On average in the EU, around 6% of respondents who had contact with a public healthcare practitioner or hospital within the previous 12 months reported they had to give an extra payment, gift or donation, the proportion changing very little from 2013 (Figure 7.5, bottom). The differences between countries, however, is marked. In Romania, the proportion was 20% in 2019, the largest in the EU, though this was down from a third since 2013. The proportion also fell markedly over

[15] European Commission (2020). The exact question asked is: "*Apart from official fees did you have to give an extra payment or a valuable gift to a nurse or a doctor, or make a donation to the hospital*?"

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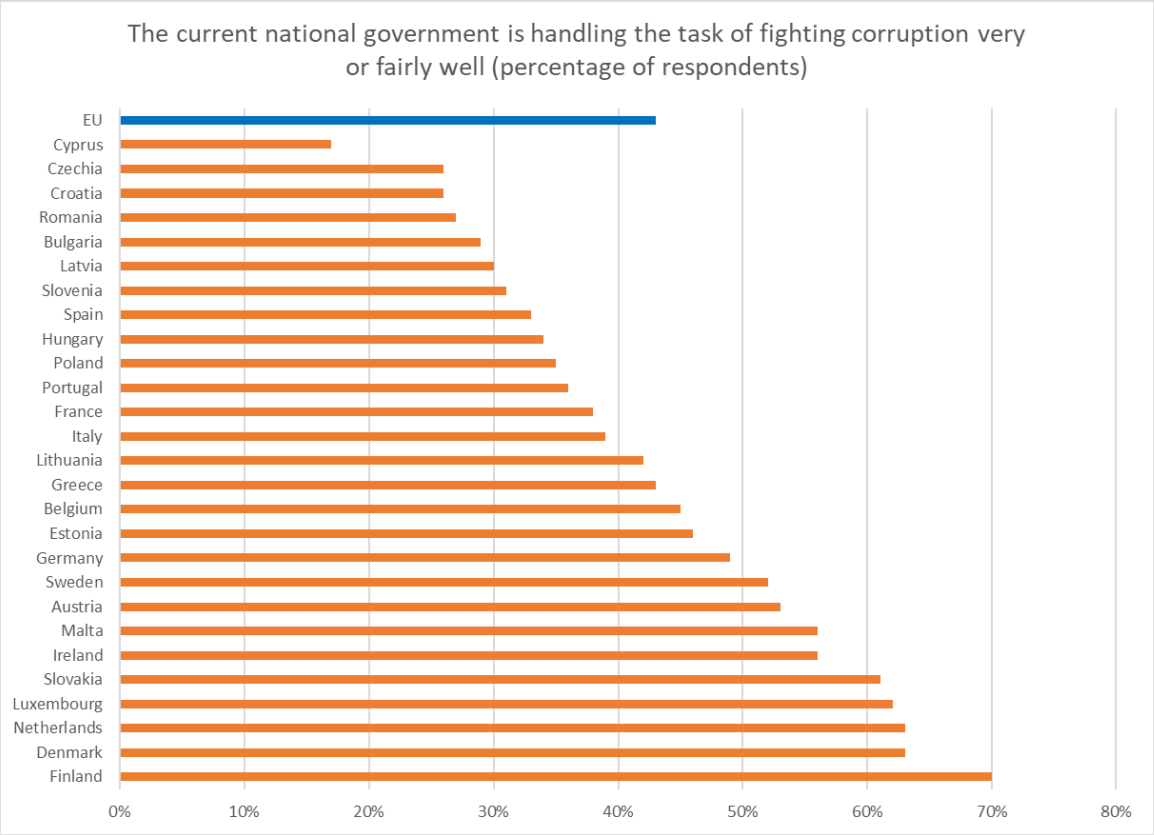
the period in Lithuania, from 21% to 10%. By contrast, in Austria and Luxembourg, there was a sharp increase in the proportion of those reporting having to make a payment, from 3% to 17% in Austria and from 1% to 9% in Luxembourg.

According to 2021 data, on average in the EU 43% of the people think that their national government is doing well in tackling corruption with respect to a slightly higher percentage of people - 49% - thinking that their government is doing a bad job (2021 Global Corruption Barometer in the EU by Transparency International[16]). Less than 30% of the people interviewed are satisfied about their government action against corruption in Cyprus, Czechia, Croatia Romania and Bulgaria, whilst the majority of the respondents (> 50%) are satisfied in the Nordic countries, Luxembourg, Austria, Malta, Ireland, Slovakia and the Netherlands (Figure 7.XX).

FIGURE 7.XX: percentage of people thinking that their national government is handling very or fairly well the fighting against corruption (Source: 2021 Global Corruption Barometer by Transparency International)

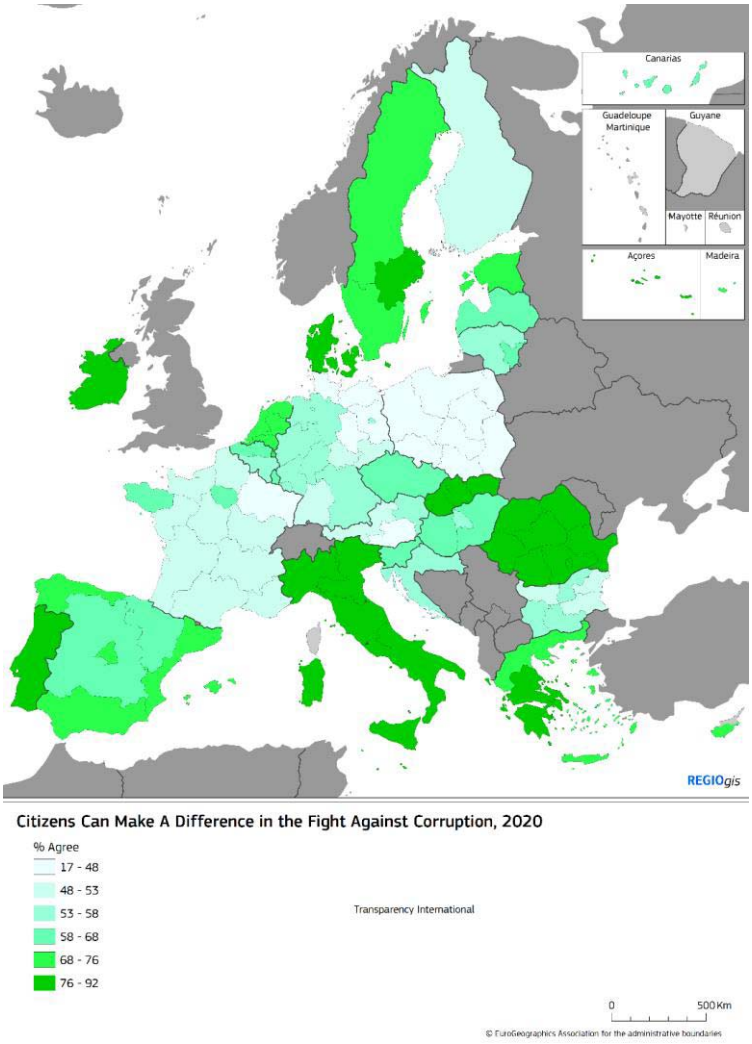


People's engagement can make a big difference in the fight against corruption. Strengthening the role of the general public can help to improve institutional accountability and transparency, and therefore

[16] https://www.transparency.org/en/

overall governance. For example, allowing the public to make comments on the services received and publishing them can prove a strong incentive for institutions to provide efficient and impartial services. The majority of people (62%) in 2020 believed they could make a difference in the fight against corruption (Map 7.4). The proportion was particularly large in countries with a high perception of corruption among the population, specifically in Romania, Portugal, Greece and Italy, where 75% of survey respondents agreed they could play a role in combating corruption.

Map 7.4: Percentage of respondents who agree that citizens can make a difference in the fight against corruption (Source: Transparency International,2020).



5. Public procurement: high standards to safeguard the public interest

Public procurement, which amounts to 14% of EU GDP[17], is one of the government activities most vulnerable to corruption (OECD, 2016). The volume of transactions, the financial interests at stake, the complexity of the process, the close interaction between public officials and businesses, and the many stakeholders involved in public procurement increase significantly the risk of corruption and the potential incentives to engage in corrupt practices.

EU legislation contains a minimum set of harmonised public procurement rules designed to ensure a level playing field for businesses and to prevent corruption. The Single Market Scoreboard contains 12 indicators to monitor how Member States perform each year in this regard. The proportion of single bidder contracts, understood as those awarded on the basis of a single tenderer's offer, is an important indicator of public procurement standards, since such contracts imply the absence of competition in public purchasing. More bidders is usually better, as this means public buyers have more options, and can get better value for money. In 2019, almost all EU countries saw an increase in the proportion of single bidding compared to 3 years earlier, especially Greece (+25 pp), Portugal and Czechia (+18 pp) (Figure 7.6, left). The only exceptions are Croatia, where the proportion of single bidder contracts more than halved between 2016 and 2019, Sweden (-5 pp) and Cyprus (with a marginal decrease of 1 pp).

The proportion of contracts awarded without any call for tender at all is an even stronger indicator. Calling for tenders before starting procurement negotiations is good practice as it makes the bidder selection process more transparent and increases competition, generally leading to better value for money. Between 2016 and 2019, the proportion of such contracts declined in most EU countries (Figure 7.6, right), and by over 10 pp in Czechia and Cyprus (though it still remained among the largest in the EU). Bulgaria was the main exception, with the proportion of single bidder contracts increasing from 15% to 29%, though there was also a sizeable increase in Slovenia.

[17] The EU Single Market Scoreboard web page; reporting period 2019: https://ec.europa.eu/internal_market/scoreboard/performance_per_policy_area/public_procurement/index_en.htm#indicators

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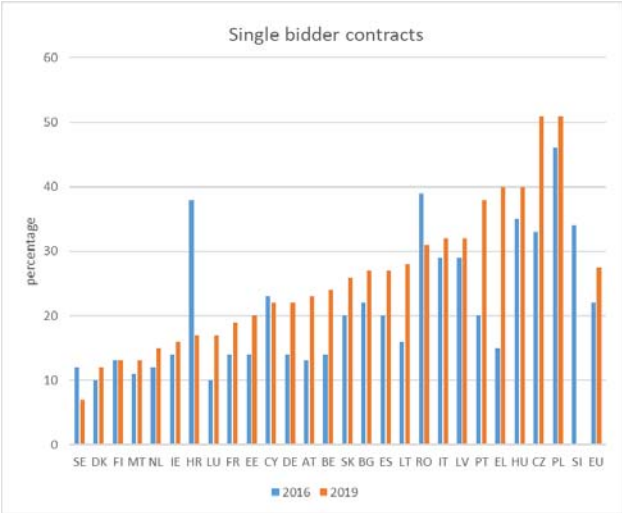
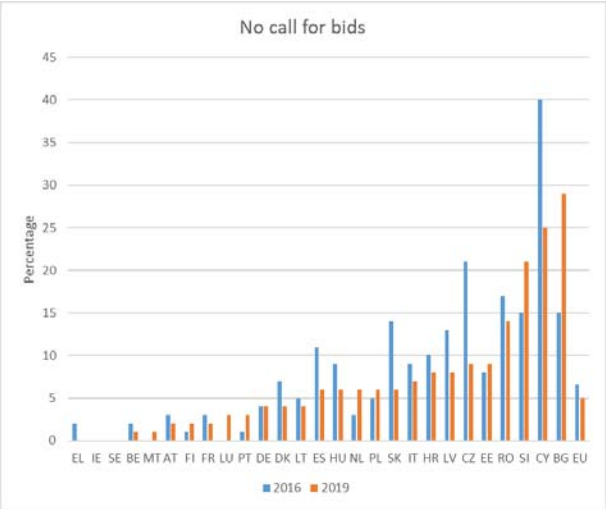
Figure 7. 6 Public contracts awarded with only a single bidder (left) and public contracts awarded without a call for tender (right), 2016-2019





Note: Countries ordered by the proportion in 2019. EU values computed as population-weighted averages of national values. Data on Single bidder contracts in 2019 missing for Slovenia.

Source: The EU Single Market Scoreboard.

The Government Transparency Institute database provides a picture of public tenders published in Tender Electric Daily (TED) at the regional level [18]. The database includes only public tenders conforming to certain criteria, for example, tenders published by regional authorities or regional agencies[19]. Single-bidder contracts, which tend to provide lower value for money, are most common in the north-western part of Poland and some regions in Bulgaria as well as in Slovenia (Map 7.5, top-left). The proportion of single-bidder contracts increased in the majority of EU regions between 2011-2013 and 2018-2020, but declined in Lithuania, most of Romania, part of Poland, Hungary, Slovakia and a few other regions across the EU. (Map 7.5, bottom-left).

The proportion of regional and local authority contracts awarded without a call for tender was relatively large in 2018-2020 in central and southern parts of the EU, plus Romania. In the Romanian region of Sud–Vest, Oltenia, Severozápad in Czechia and Picardie in France, this proportion was over 40% (Map 7.5, top-right). Between 2011-2013 and 2018-2020, the proportion went down in most

[18] Fazekas and Czibikb (2021).

[19] The trends at the regional level do not always match those observed by the EU Single Market Scoreboard as the share of regional contracts with respect to the total number of contracts (regional, national and European) varies highly among Member States, going from 4% in Malta to 78% in Sweden (average over the period 2018-2020).

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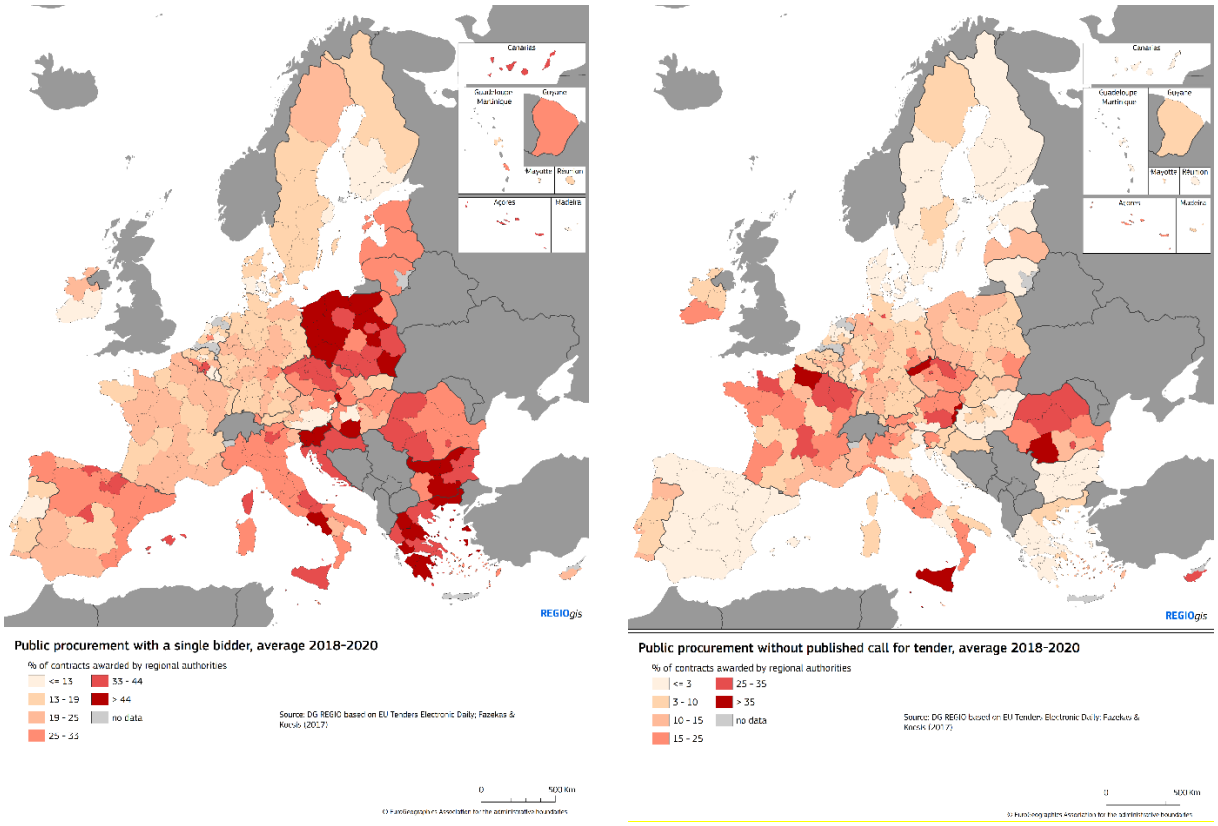
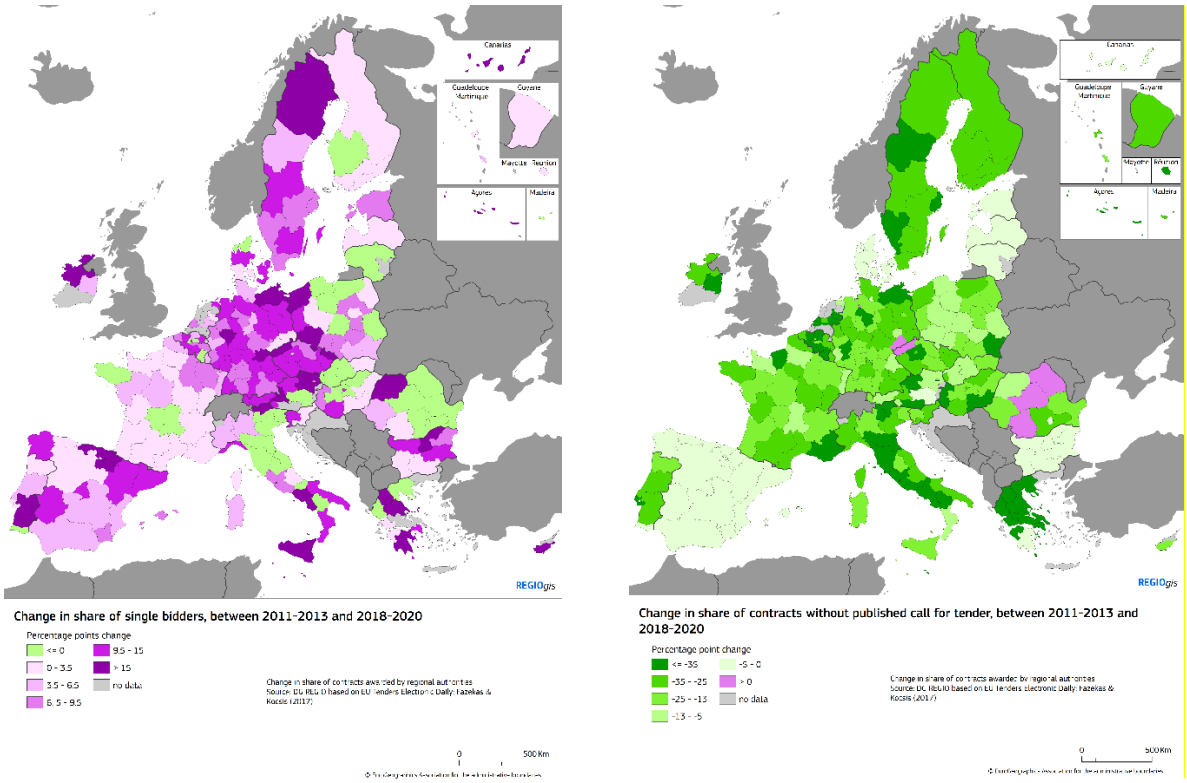
regions, though it increased: in central Romania, Severozápad (Czechia) and two German regions, Bremen and Chemnitz (Map 7.5, bottom-right).

Map 7.5: Regional variations in proportion of single bidder contracts and of contracts awarded without a call for tender.





Note: Three-year averages are shown as some regions have only a small number of public procurement contracts each year.

Source: DG REGIO own computation based on administrative data on public procurement tenders (Fazekas and Czibikb, 2021).

6. An efficient and agile business environment is a key asset

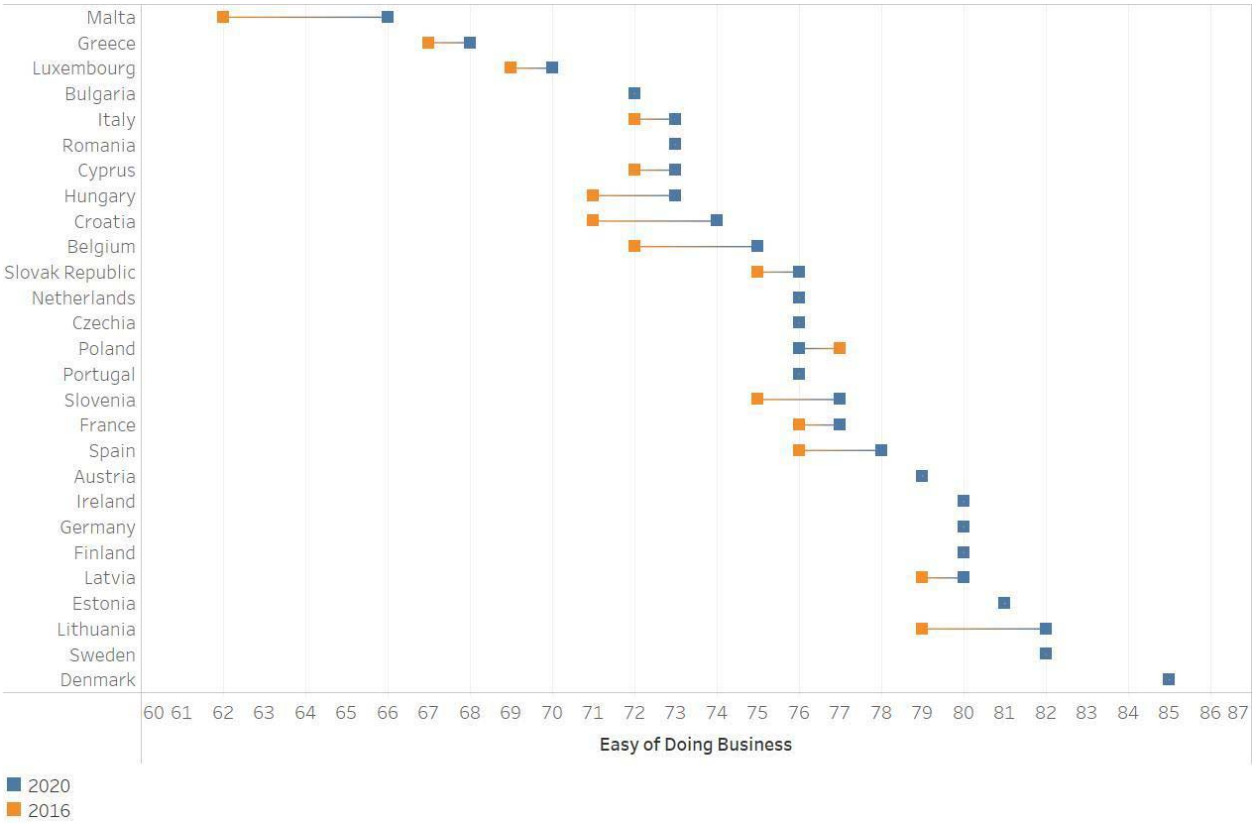
One of the adverse effects of inefficient institutions is a regulatory environment that burdens domestic firms and adversely affects entrepreneurship. Poor quality institutions hamper the creation of new businesses and may lead to entrepreneurs seeking opportunities abroad or giving up altogether.

The 'Ease of doing business' Index, published up until 2020 by the World Bank, assesses areas of business regulation in the largest business city in each of 190 countries across the world. It helps to monitor and compare the quality of the business environment and, in addition, assesses a subset of business regulation areas within selected countries, including 14 EU Member States[20]. The overall 'Ease

[20] The 14 covered since 2015 are Austria, Bulgaria, Croatia, Czechia, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Slovakia and Spain.

of doing business' score is the average of the indicators for the different areas, each indicator showing the distance of each country from the best performing country in the area concerned[21].

Figure 7. 7 Ease of Doing Business score (best=100), 2016 and 2020



Note: Countries ordered by the 2020 score. Where only one score is indicated, there was no change between the two years.

Source: World Bank Doing Business 2016 and 2020.

Over recent years, policy reforms have made the EU more business friendly. Since 2016, most Member States have improved their business environment (Figure 7.7). The Nordic countries (Denmark is ranked fourth worldwide) and the Baltic States together with Ireland, Germany and Austria are assessed as having the most friendly business environments in the EU in 2020. Malta, Greece, Luxembourg[22] and Bulgaria score the lowest, though in all of them, except Bulgaria, the score improved over the preceding 4 years.

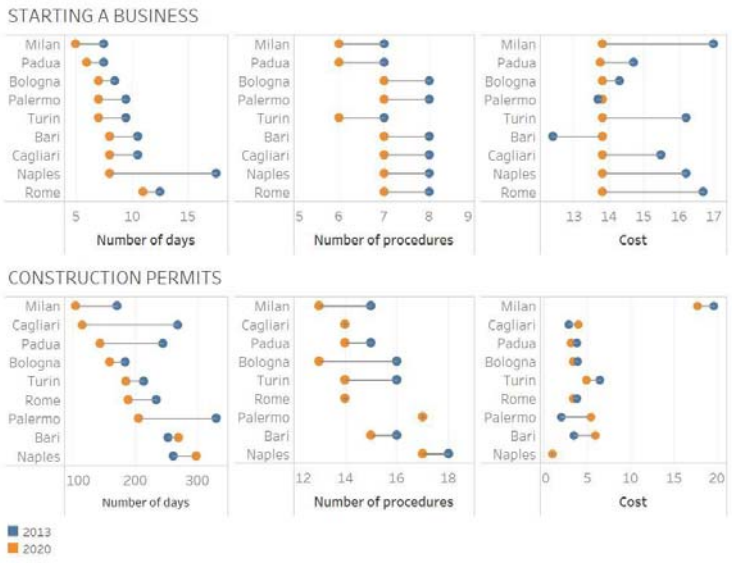
[21] For each area and each country/city, the computation of the ease of doing business score involves two steps. In the first step, each individual indicator y is normalised using a linear transformation (worst – y)/(worst – best), where the highest score represents the historical best regulatory performance on the indicator. In the second step, the scores obtained for individual indicators are aggregated through simple, equal weighting, averaging into one score.

[22] The low score of Luxembourg is due to its very low score on the Getting credit indicator (15/100) and medium scores on Resolving insolvency (46/100) and Protecting minority investors (54/100).

A closer look shows that EU countries differ significantly across the various business regulation areas. For example, in 2020, to meet government requirements for starting a business, an entrepreneur in Poland had to pay fees equivalent to 12% of the average national income per head and complete 5 administrative procedures that took 37 business days altogether. By contrast, an entrepreneur in Estonia paid 1% of national income per head and had to spend only 3.5 business days completing three procedures.

COMPARISON OF THE TWO ITALIAN SUB-NATIONAL DOING BUSINESS SURVEYS

Two surveys at the subnational level – 2013 and 2020 - are available for Italy, allowing for a comparison of the performance of Italian cities over time. Starting a business became quicker and easier in all the cities covered by the survey, while the cost was reduced as well in all of them except Bari. For example, in Naples, starting a business took 18 days in 2013 but only 7.5 days in 2020, the number of procedures was reduced from 8 to 7 and the cost by 15%. The cost of dealing with construction permits declined over the 7 years in Milan. It also declined in Turin, though from a much lower level, and marginally in Padua, Bologna and Rome, but it increased in Palermo, Bari and, if only slightly, in Cagliari. On the other hand, the time taken to obtain a construction permit shortened between 2013 and 2020 in all the cities, apart from Naples and Rome, and the number of procedures involved declined in all of them.



Italy, Sub-national Doing Business 2013 and 2020. For each indicator – starting a business (top) and dealing with construction permits (bottom) - cities are ordered by the number of days required in 2020. Only cities covered by both surveys are included.

Source: World Bank Subnational Doing Business, Italy, 2013 and 2020 Reports.

The sub-national doing business reports assesses a subset of the national doing business indicators which are most likely to vary within a country. They reveal substantial differences between cities despite them operating within the same national legal and regulatory framework. The most recent national surveys were carried out in three waves: Croatia, Czechia, Portugal and Slovakia in 2018, Greece, Ireland and Italy in 2020 and Austria, Belgium and the Netherlands in 2021. Two indicators – 'Starting a business' and 'Dealing with construction permits' - are considered below[23].

Among the 10 countries, starting a company is easiest and quickest in Greece, with requirements being much the same in all the cities examined. It takes longest in Austria, Czechia, Slovakia and Zagreb, the

[23] S*tarting a business* covers the procedures, time, cost and minimum paid-up capital needed to start a limited liability company, and *Dealing with construction permits*, covers the *p*rocedures, time and cost required to complete all the formalities for building a warehouse and the quality control and safety mechanisms involved in obtaining a construction permit.

Croatian capital, at over three weeks (Figure 7.8), and it is also more costly than the EU average. Zagreb is the only city of those covered in Croatia where the online business registration system, which provides a single access point for company start-ups, is not used to its full potential[24]. All the cities covered in Austria, Czechia and Slovakia perform poorly in terms of both duration and number of administrative procedures, but the process is relatively cheap, costing only around 1% of national income per head in Czechia and Slovakia and 4.5% in Austria. In the Netherlands, Portugal and Greece, the duration, number of procedures and cost are well below the EU average. The procedure is also relatively quick in Italian cities, Rome being the city where it takes the longest, 11 days, but this is still slightly below the EU average. While the number of procedure in Italian cities is similar to the EU average, the cost is higher than anywhere else, at 14% of national income per head, almost three times the EU average.

Effective construction regulations matter for public safety, but also for the health of the construction industry and the economy as a whole. In 2019, the industry accounted for 5.5% of EU gross value-added and for around 6.5% of employment. The time, complexity and cost of obtaining a construction permit (here for a warehouse) varies markedly between cities, even in the same country (Figure 7.9). A major reason is the differing length of time taken to obtain an excavation permit, a process that can be shortened by improving electronic permit systems. Getting a construction permit is quickest in Cagliari and Milan in Italy and Varazdin, in Croatia. By contrast, it takes much longer than the EU average (of 170 days) in the southern Italian cities, apart from Cagliari, and in all the Slovakian and Czech cities covered. In these cases, requesting a permit involves a large number of preconstruction approvals, especially in Czechia. In both here and Slovakia, the length of the process stands in contrast to the low cost of obtaining the permit, at only 0.3% of the value of the building concerned in all the cities. The average cost of construction permits is well above the EU average in Croatia, Dublin and some Italian cities, Milan being the most expensive at almost 18% of the building value or over 7 times the EU average. Nevertheless, in Italy, starting a business became quicker and easier between 2013 and 2020 in all the cities covered by the survey, and the cost was reduced in all except Bari (see Box).

[24] World Bank 2018, 2020 and 2021.

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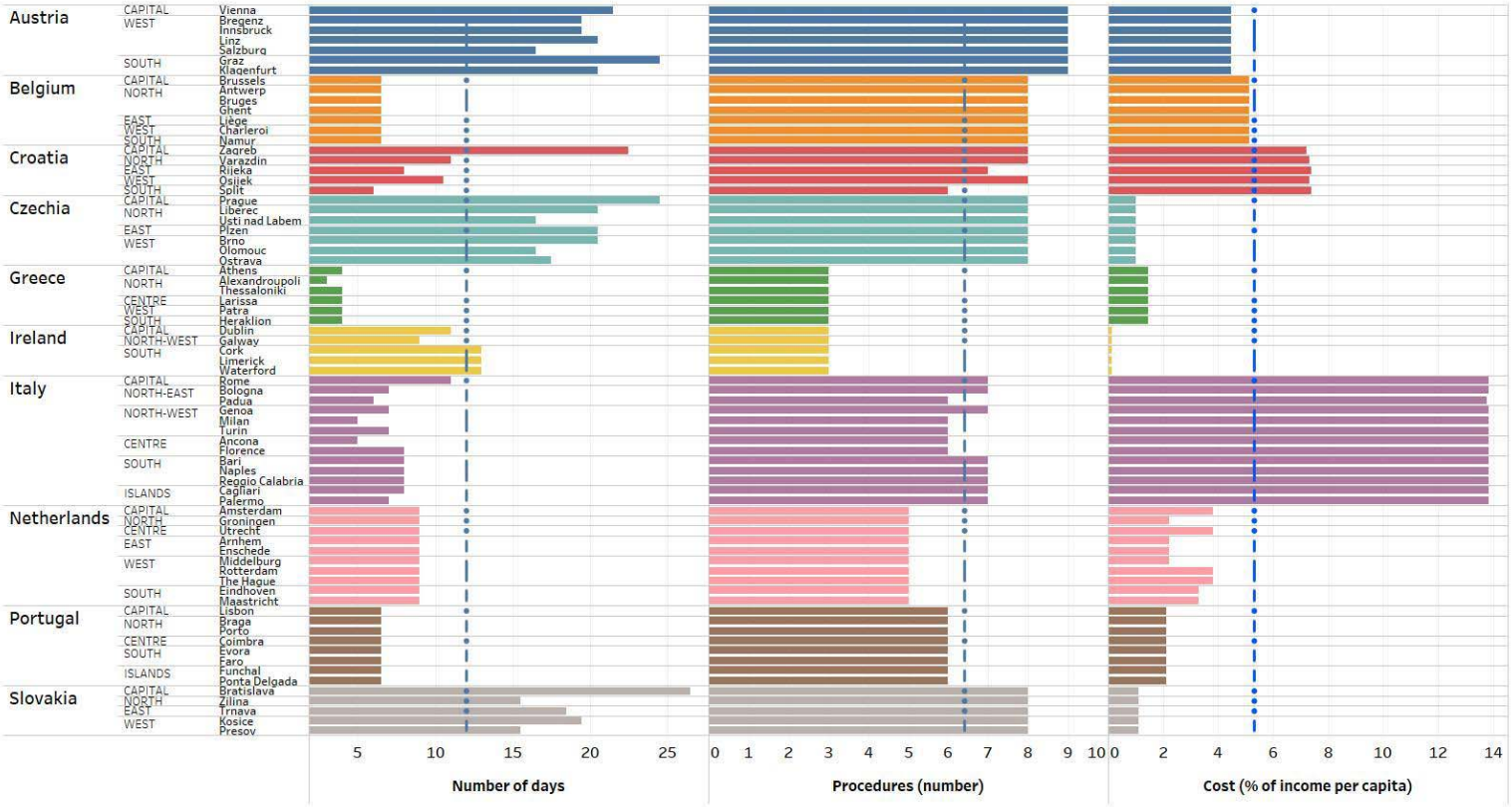
Figure 7. 8 Sub-national differences in starting a company, 2018/2021



Note: The vertical blue lines indicate the EU average for 2020 based on national data, computed as population-weighted average of 2020 country values, which relate to the capital city.

Source: DG REGIO calculations based on the World Bank Sub-National Doing Business Reports, years: 2021 (AT, BE and NL); 2020 (EL, IE and IT) and 2018 (HR, CZ, PT and SK).

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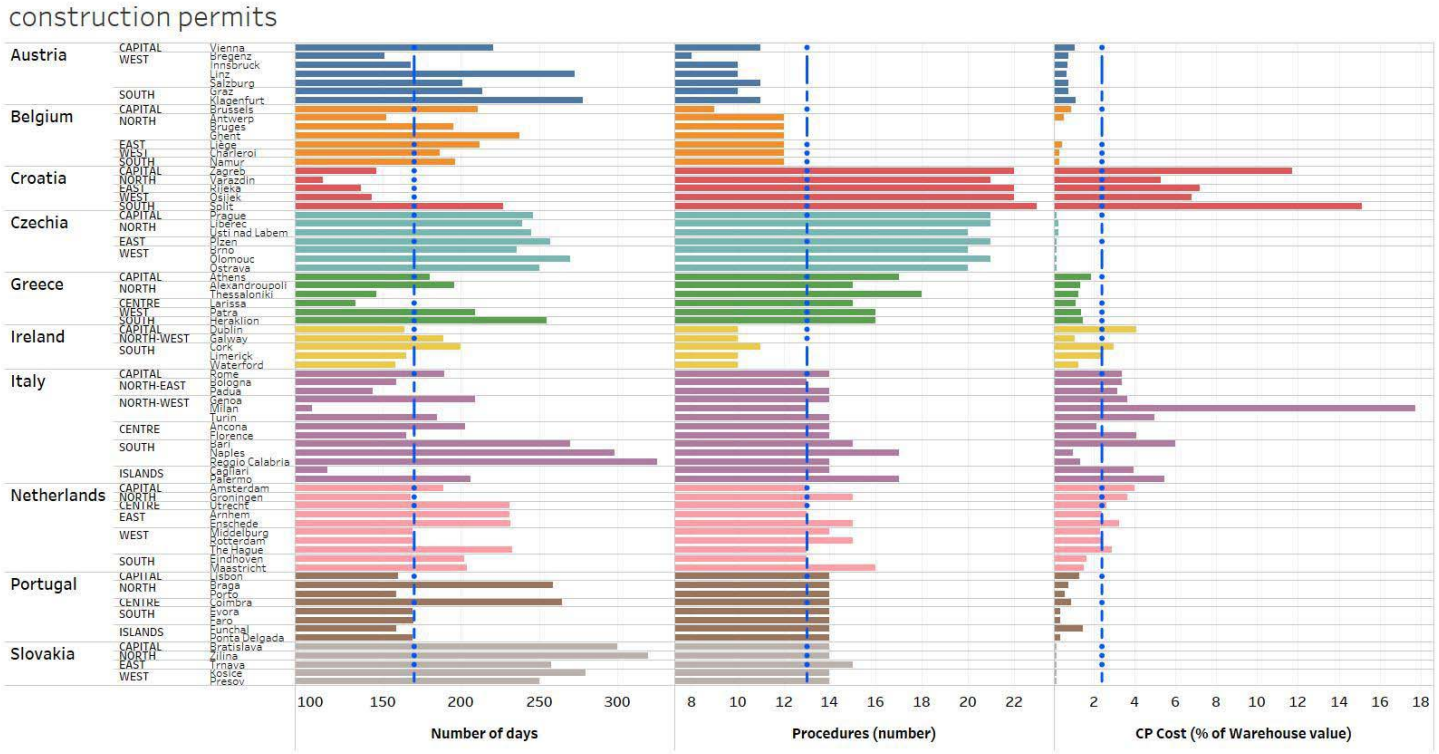
Figure 7. 9 Sub-national differences in dealing with construction permits, 2018/2021



Note: The vertical blue lines indicate the EU average, computed as population-weighted average of 2020 country values, which relate to the capital city.

Source: DG REGIO calculations based on the World Bank Sub-National Doing Business Reports – years: 2021 (*AT, BE and NL*); 2020 (*EL, IE and IT*) and 2018 (*HR, CZ, PT and SK*).

7. E-Government as a means of increasing transparency and accountability

Public authorities can increase their efficiency and improve their relationship with the public through e-Government, which is the use of technology to improve and facilitate government services, for example to request birth certificates or submit tax declarations online. Wider and easier access to public services ultimately increases their transparency and accountability, while reducing red tape and corruption. For some time, ICT has offered a range of tools to meet the needs of e-Government and in 2020 over half of people in the EU aged 16-74 (57%) used the internet to interact with public authorities. While there are considerable differences in usage between Member States, inter-regional differences are, in most cases, small (Map 7.6, left). In the Nordic Member States, the Netherlands and Estonia, 80% or more of people used the internet to interact with public authorities and in most of

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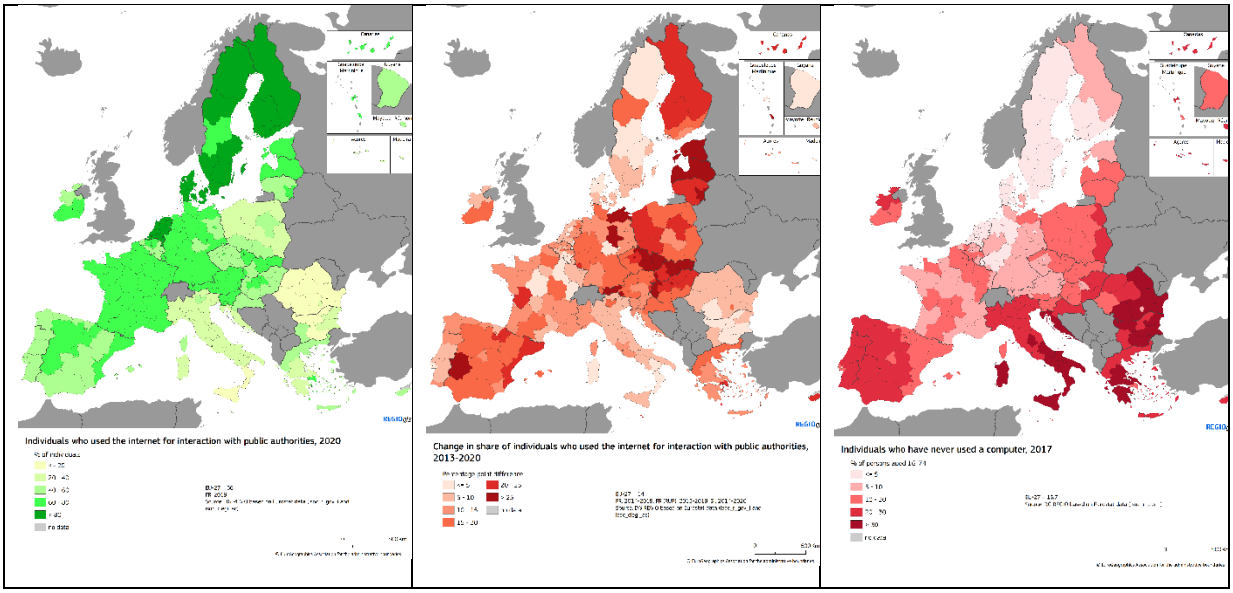
French regions, apart from Corse and the outermost regions, this was true for over 70% of the survey respondents. By contrast, the share was less than 20% in southern Italy and Romania, except for the capital region where it was around 30%[25]. The share of internet users of government services is also small in the rest of Italy and most parts of Bulgaria and the increase since 2013 has been marginal (Map 7.6, centre).

Low usage of e-Government services is likely to be linked to lack of internet access and/or low levels of technological readiness, which is a feature of some regions in the EU. In particular, in 2020, over 30% of people in the south-east of Romania reported that they did not have any access to the internet, whether by mobile phone, computer or other device[26]. A third of people in southern Italy, western Croatia and most regions in Romania and Bulgaria reported never having used a computer in their lives (Map 7.6 – right). Being able to use at least one of devices such as computer, laptop, tablet, mobile or smartphone is a necessary skill to be able to benefit from e-Government services. The development of the information society is critical for creating the necessary conditions for a modern, competitive economy and strengthening economic resilience.

Map 7.6 Internet and computer use in the EU, 2020 and 2013-2020 **The following go as titles to the 3 maps *Interaction with public authorities via the internet in the previous 12 months (% population) (left). Change in interaction with public authorities via the internet, 2013-2020 (Percentage point change) (centre). Individuals who have never used a computer (% population) (right).***



Source: DG REGIO based on Eurostat data (datasets: isoc_r_gov_i; isoc_ciegi_ac and isoc_r_cux_i)[27].

[25] NUTS2 level data for Italy and France relate to 2019.
[26] Gallup World Poll ad-hoc 2020 regional survey.
[27] Data for Germany, Greece and Poland are available only at the at NUTS1 level.

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How can more people be encouraged to use the internet to interact with public authorities? Increasing e-Government usage can be seen as a virtuous circle: if most government services can be readily accessed online, more people will be inclined to use them and if public demand is high, authorities will be pushed to develop better digital services. The yearly e-Government Benchmark reports give an insight into the availability and usability of public e-services in the EU[28]. They indicate how countries perform in four key e-Government areas:

1. User-centricity, which indicates the availability and usability of public e-services.
2. Transparency, which indicates the intelligibility of government operations, service provision procedures and the level of control users have over their personal data.
3. Cross-border mobility, which indicates the availability and usability of services for people and businesses located abroad.
4. Key enablers, which indicate the availability of five functions, such as e-ID cards.

The assessment in each area is based on responses to questions on the quality and quantity of e-Government services provided. The average score over the four areas represents the overall e-Government performance of a country, on a scale from 0%, the worst, to 100%, the best performance over the four sets of indicators. Over the period 2016-2017 to 2018-2019[29], the provision of digital public services improved in all EU countries, but at different rates (Figure 7.10). Malta remained the top performer, followed by Estonia, with a score above 90% in 2018-2019. In terms of the change in e-Government performance, Croatia, Greece, Hungary, Ireland, Italy, Luxembourg and Slovenia all improved their score by more than 10 pp, especially Luxembourg (from 59% to 79%).

[28] Van der Linden et al. (2020).
[29] For methodological reasons, the e-Government Benchmark results are published as biennial averages: https://ec.europa.eu/digital-single-market/en/news/egovernment-benchmark-2020-egovernment-works-people .

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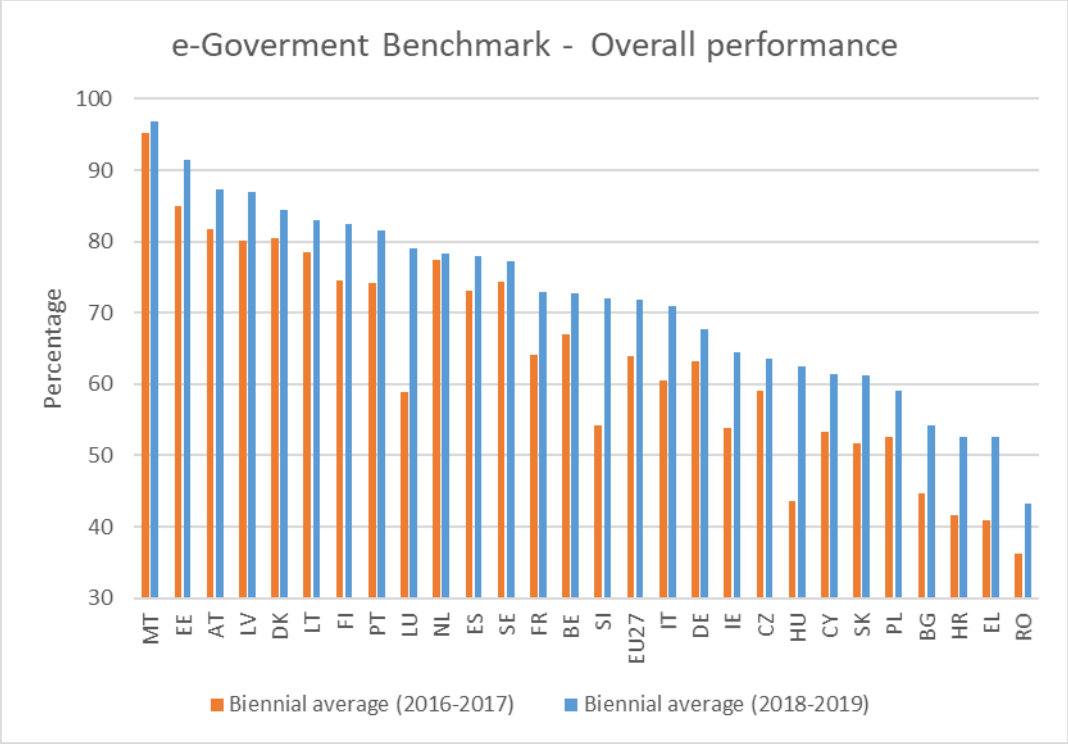
Figure 7. 10 Overall e-Government country performance, from 0% (worst) to 100% (best), 2016-17 and 2018-19



Note: Benchmark computed as the average score over the four e-Government sets of indicators. Countries ordered from best to worst by the score in 2018-2019.

Source: e-Government Benchmark report (Van der Linden et al., 2020).

The overall e-Government score shows the aggregate picture, but countries perform differently across the four areas (Figure 7.11) and the dispersion around the average score tends to widen as the country performance worsens (right-hand side of Figure 7.11). User centricity improved in all Member States, implying that public services became more available online, more mobile-friendly and with more online support available. People living abroad generally struggle to access and use online services in their home country, as highlighted by the low scores on the cross-border mobility indicator, which is a weak point for all EU countries. A major bottleneck is the difficulty people abroad have in accessing services requiring authentication. In 2018-2019, only 9% of the services usually accessed by residents via a domestic electronic identity document – eID –could equally be accessed using a foreign national eID.

To improve cross-border interoperability of national online identification systems, the European Commission has proposed a new regulation on digital identity. The European Digital Identity[30] will be

[30] https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity_en

available to EU citizens, residents, and businesses who want to identify themselves or provide confirmation of certain personal information. The 2030 Digital Compass sets out the milestones towards fully reaping the benefits of a digital EU, including improving e-Government. In particular, by 2030, all key public services should be available online, all citizens should have access to electronic medical records, and 80% of the population should be able to use electronic identification.

Figure 7. 11 Country performance in e-Government areas, 2018-19

Note: Countries ordered from worst to best (reading from top) by their average performance across the four areas.

Source: e-Government Benchmark report (Van der Linden et al., 2020).

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PART 14/16

COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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Chapter 8 NATIONAL INVESTMENTS AND COHESION

Highlights

- In the 2014-2020 programming period, cohesion policy funding made a major contribution to sustaining public investment in the EU in the context of fiscal consolidation following the economic and financial crisis; this was especially so in Cohesion countries.
- While EU Member States in many cases have significant nationally-financed policies to tackle regional disparities, cohesion policy is the main source of financing for regional development policies in less developed countries.
- Public investment, whether from the EU or national sources, is essential for regional development especially when it triggers additional private investment to reinforce the process.
- Policies that shift economic activity into higher value-added sectors and improve productivity and competitiveness, together with investment in human capital, transport infrastructure and improved governance, seem most effective in reducing regional disparities.
- Public finances improved steadily across the EU from the aftermath of the economic crisis up until 2019. However, the restrictions imposed to control the COVID-19 pandemic necessitated extraordinary policy measures to counter the economic downturn induced and to safeguard jobs, worsening the budget balance in all countries.
- At the onset of the COVID-19 crisis, public investment in the EU was lower than before the financial crisis of 2008-2009, particularly in many Cohesion countries, raising concerns about the effect on their long-term growth potential and convergence towards GDP per head in the rest of the EU.
- Regional and local authorities executed almost a third of the total general government expenditure and the majority of public investment in the EU (58% in 2019), though there are marked differences between Member States.
- Regional and local autonomy indicators suggest that spending and investment decisions are more centralised in Cohesion countries than in the rest of the EU. Although the difference narrowed between 1990 and 2010, it has widened again over the past decade.

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8.1 Introduction

This chapter examines nationally-financed policies to tackle territorial disparities in a subset of Member States. It then overviews national and sub-national public finances across the EU, focusing on government expenditure and investment trends over recent years and the differences between countries.

Section 8.2 starts by indicating the importance of cohesion policy in supporting public investment, especially in the less developed parts of the EU. It then presents the results of a study that analyses nationally-financed policies to tackle territorial disparities, which complement cohesion policy interventions.

Section 8.3 examines national public finances. It overviews trends in general government budget balances and debt, expenditure and revenue, focusing on developments in public investment and the functional categories of spending, including the apparent effects of the COVID pandemic and the response to this.

Section 8.4 focuses on sub-national public finances and examines expenditure and investment undertaken by state, regional and local governments in relation to the differing levels of decentralisation which exist across the EU.

Section 8.5 finally provides a summary of the main conclusions.

8.2 Cohesion policy, investment and national policies addressing territorial disparities

8.2.1 Cohesion policy and government capital investment

Cohesion policy is the EU's main investment policy, providing funding equivalent to 14% of government capital investment (from both national and EU sources) in the EU-27 over the period 2014-2020. Although not all cohesion policy funding goes to capital investment, particularly as regards the ESF and the YEI, the figure gives a rough indication of the importance of cohesion policy for Member States, especially the less developed ones. In Non-Cohesion countries, the figure was lower (just under 6%), but in Cohesion countries it was over 50%. The importance of cohesion policy increased between the 2007-2013 and the 2014-2020 programming periods, with most of the increase occurring in Cohesion countries (Figure 8.1).[1]

Restricting the comparison to the ERDF and CF, which mainly go to financing investment gives a more realistic view of the weight of cohesion policy in funding government investment in Member States – though some of the ERDF goes to financing businesses rather than public investment. This shows that the ERDF and CF in 2014-2020 amounted to around 10% of the total public investment carried out across the EU. The ERDF and CF jointly allocated a level of financing equivalent to about 3.6% of

[1] Note that, unless otherwise specified, the cut-off date for the Eurostat data used in this chapter was November the 30th 2021.

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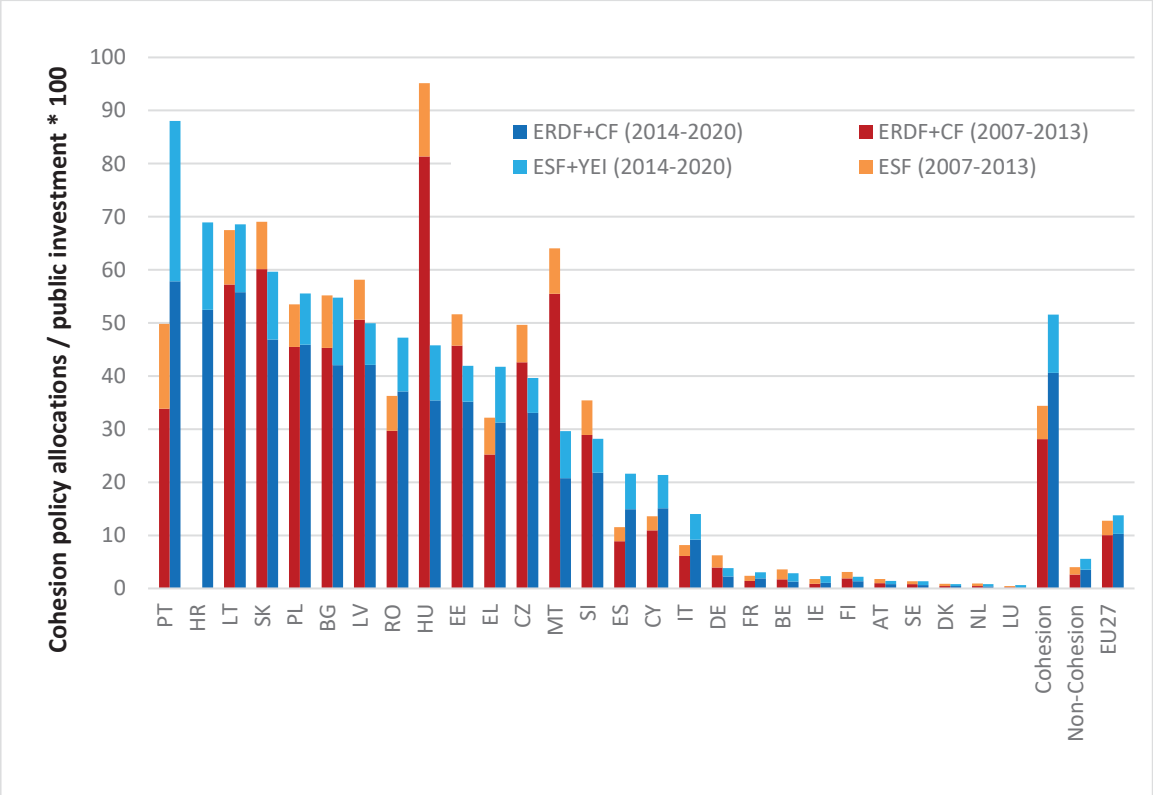
total public investment in Non-Cohesion countries and 40.6% in Cohesion countries, up 1 pp from the previous period for the former, and up more than 12 pp for the latter.

These figures suggest that cohesion policy has made a major contribution to sustaining public investment in the EU after it was reduced in the aftermath of the Great Recession of 2008-2009 and the sovereign debt crisis of 2011 (between 2008 and 2012, public investment declined by 20% in Cohesion countries and by 9% in Non-Cohesion countries).

Figure 8.1 Cohesion policy funding relative to government investment in Member State in the 2007-2013 and 2014-2020 programming periods [Y-axis label: % of government investment]



Source: Eurostat gov_10a_main, and https://cohesiondata.ec.europa.eu

8.2.2 National policies addressing territorial disparities

A study carried out by the European Commission in 2019[2] analysed policies entirely financed by national resources to tackle territorial disparities in 11 Member States, all except Italy and Spain,

[2] European Commission (2019), *Study on National Policies and Cohesion - Final Report Contract No 2017CE16BAT125*, Luxembourg: Publications Office of the European Union. The study is available at this link: https://ec.europa.eu/regional_policy/en/information/publications/studies/2020/study-on-national-policies-and-cohesion. It

Cohesion countries.[3] Around 60 measures were identified, involving a range of policy instruments targeted at different aspects of development, such as urbanisation, connectivity, labour force skills, mobility, trade, innovation, and the business environment. The most common types of measure were direct support to business development and innovation, transport infrastructure projects, and tax incentive schemes to support trade and improve the business environment.

The vast majority of the nationally-financed policies concerned have an explicit spatial focus, targeting regions with particular economic problems, such as high unemployment. Most measures, however, are designed and implemented at national level, with limited involvement of regional authorities. This is especially the case in countries where sub-national authorities execute only a small share of public expenditure (as in Bulgaria, Croatia, Hungary, Portugal, Romania and Slovenia).

In the countries covered, cohesion policy is by far the main source of financing for territorial policies. Only Romania and Italy have a significant budget for national policies for regional development, but then only equivalent to slightly over a third of the total funding available to cohesion policy programmes. In the other Member States covered, the corresponding figure is below 10%.

There are two main ways in which nationally-funded measures complement the ESIF. They either provide additional funding in national priority areas where cohesion policy funding is considered insufficient or they support activities that are not eligible for EU funding.[4]

The study shows that policies to improve productivity in general and to shift the structure of economic activity away from low value-added sectors appear to be effective in reducing regional disparities. Investment in human capital, transport infrastructure, and in building up administrative capacity and skills to improve governance is found to be an essential part of measures aimed at bringing about such a shift.

8.3 Developments of national public finances

8.3.1 Public finances improved steadily until 2019, but the COVID-19 crisis reversed the trend

The Seventh Cohesion Report[5] described a significant improvement in Member State public finances in the years following the Great Recession of 2008-2009 and the sovereign debt crisis of 2011. Gradual fiscal consolidation, aided by economic recovery from 2015 was responsible for this. However, this trend was reversed abruptly in 2020 because of the COVID-19 pandemic and the measures taken in response to it (Figure 8.2).

---

was carried out by a consortium of Prognos AG (lead), Politecnico di Milano and Technopolis Group SPRL. It is based on a combined analysis of statistical data, case studies, and stakeholder interviews.

[3] The other 9 countries were Bulgaria, Croatia, Czechia, Hungary, Poland, Portugal, Romania, Slovakia and Slovenia.

[4] The study also found that effective implementation of territorial cohesion policies at both national and regional level is frequently undermined by a lack of adequate monitoring systems, or by a failure to use the systems that do exist.

[5] Available at this link: https://ec.europa.eu/regional_policy/en/information/cohesion-report/.

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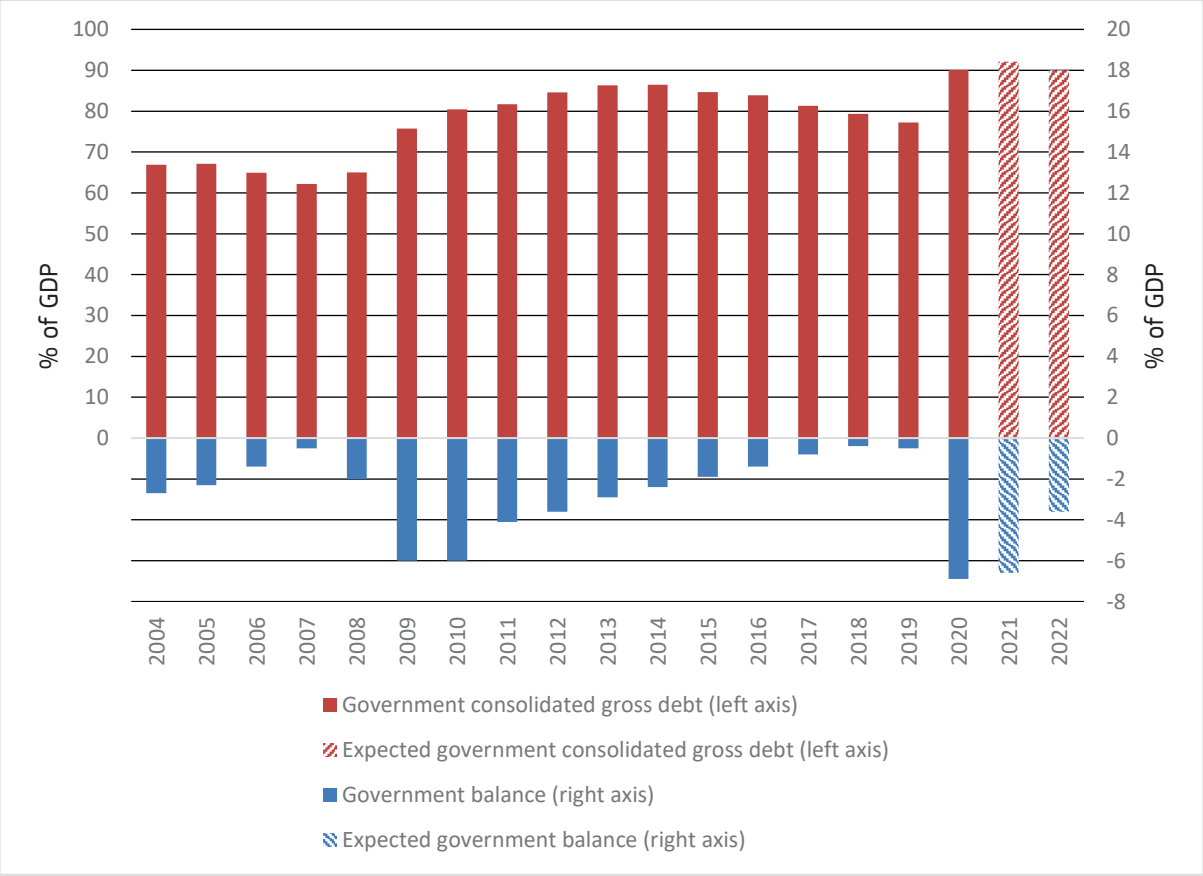
After peaking at 6% of GDP in 2009 and 2010, the government deficit in the EU-27 fell to 2.4% in 2014 and further to 0.5% in 2019, the same level as in 2007. In 2020, the deficit increased sharply to 6.9% of GDP, as a consequence of both the extraordinary fiscal measures taken by Member States in response to the economic downturn induced by the pandemic and the automatic stabilisers it triggered.[6] The deficit is estimated to decline slightly to 6.6% in 2021 and is expected to fall further to 3.6% in 2022.[7]

A similar counter-cyclical pattern is evident for public debt. The government consolidated gross debt of the EU-27 rose from 62.2% of GDP in 2007 to 86.5% in 2014 before falling gradually to 77.2% in 2019. In 2020, it increased markedly to 90.1% and is estimated to reach a new high in 2021, before declining again in 2022.

Figure 8.2 General government balance and debt, EU-27, 2004-2022



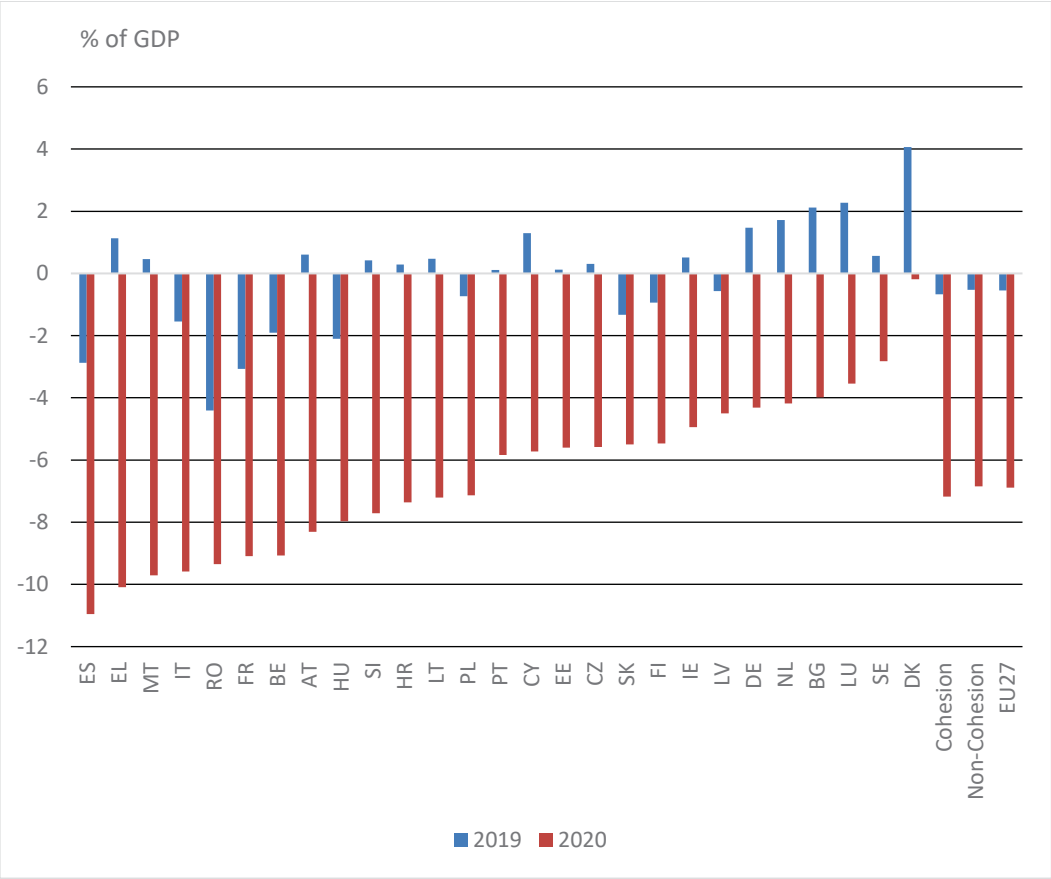
Source: Eurostat gov_10dd_edpt1 for 2004-2020, and European Commission's 2021 Autumn Economic Forecast for 2021-2022

[6] Automatic stabilisers are features of the fiscal system which result in reduced tax revenue and increased public spending in an economic downturn without discretionary government action.
[7] European Commission (2021), "European Economic Forecasts - Autumn 2021", European Economy Institutional Paper n. 160, Directorate-General for Economic and Financial Affairs, November; available at this link: https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/autumn-2021-economic-forecast_en.

The general government balances of EU Member States in 2019 and 2020 reflect the changes in public finances induced by the pandemic (Figure 8.3).

In 2019, there were 17 Member States with a fiscal surplus, and only France and Romania had a deficit greater than 3% of GDP. In 2020, all EU countries had a deficit, which was above 3% of GDP in 25 of the 27 cases, with Spain (11%) and Greece (10.1%) having the largest. The outlook of the budget balance in Cohesion countries does not appear to be substantially different from that in Non-Cohesion ones, suggesting that the stage of economic development did not determine the scale of fiscal response to the pandemic.

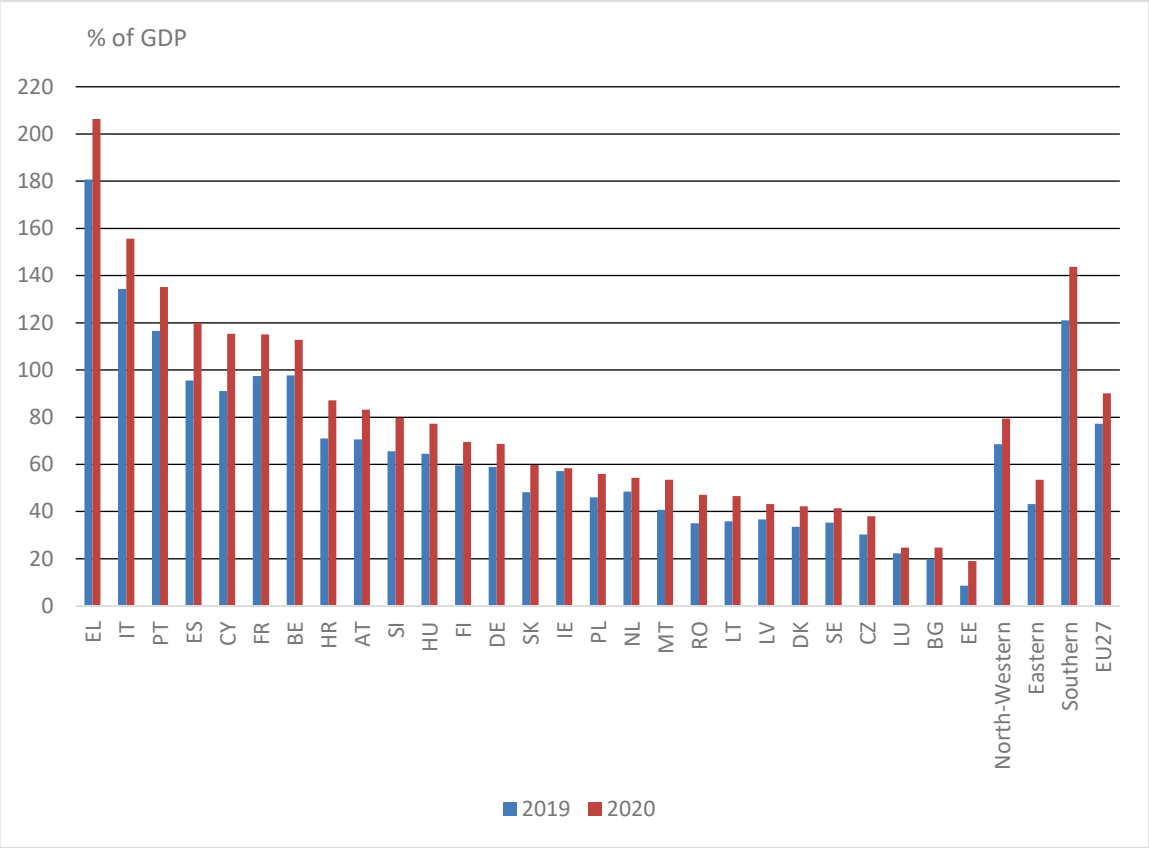
Figure 8.3 General government balance, 2019 and 2020



Source: Eurostat gov_10dd_edpt1

The effect of the pandemic is equally evident in public debt levels. In 7 countries (Greece, Italy, Portugal, Spain, Cyprus, France and Belgium), this was over 100% of GDP in 2020 as compared with only three countries (Greece, Italy and Portugal) in 2019 (Figure 8.4). The debt level was highest in the southern EU countries, (144% of GDP) and lowest in the eastern EU (53%). In 17 Member States, public debt increased by more than 10 pp in 2020 and in four of these (Greece, Spain, Cyprus, and Italy), by over 20 pp.

Figure 8.4 General government debt, 2019, 2020



Source: Eurostat gov_10dd_edpt1

8.3.2 Government expenditure peaked in 2020 as a consequence of the COVID-19 crisis

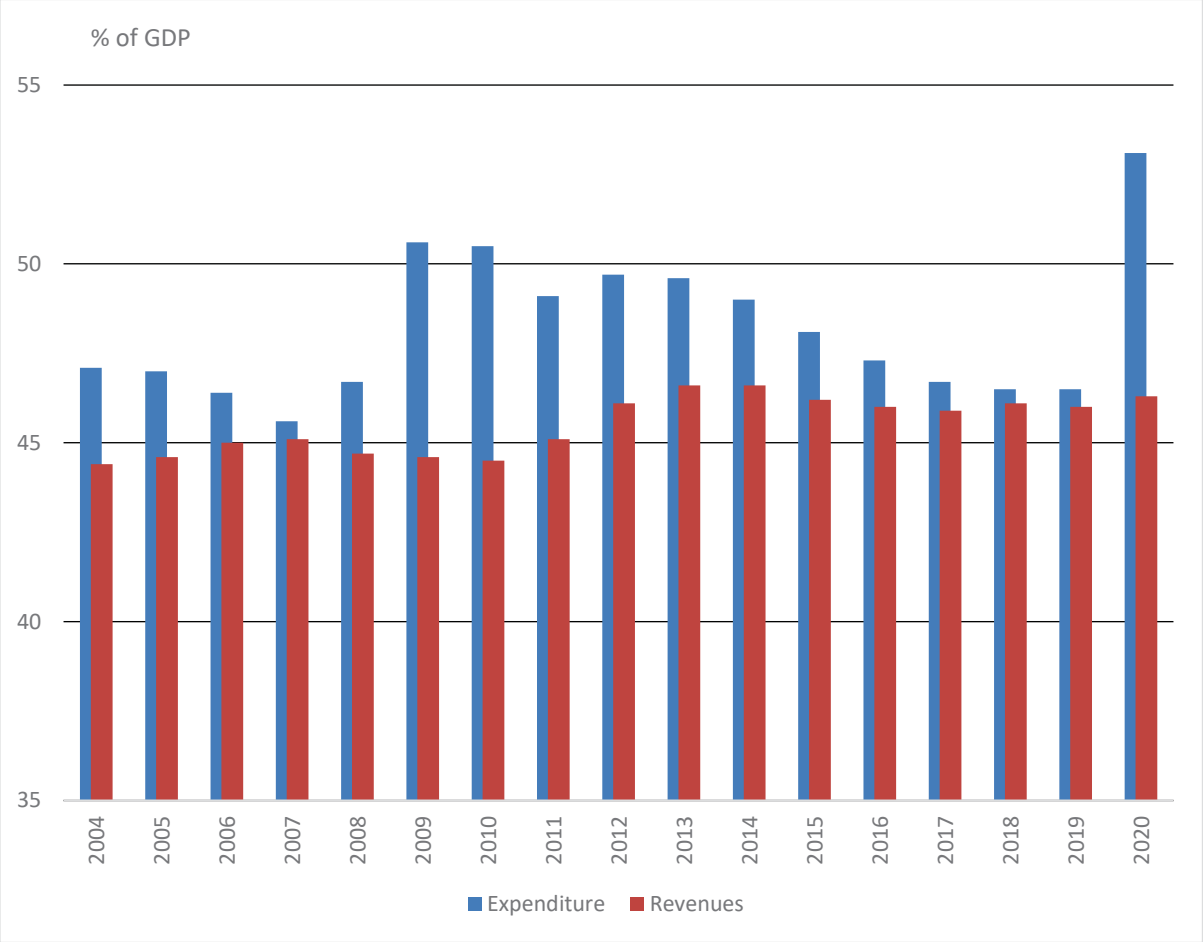
The widening of the fiscal deficit in 2020 was largely due to a sharp increase in government expenditure relative to GDP, while the revenue to GDP ratio remained broadly unchanged.[8] In the previous economic crisis in 2009 and 2010, government expenditure in the EU-27 rose to just over 50% of GDP. It declined to 46.5% of GDP in 2018 and 2019, but then increased to 53.1% in 2020 due to the combined effect of a reduction in GDP and an increase in expenditure in absolute terms (Figure 8.5). The swift rise in public expenditure occurred in all Member States, although it varied

[8] In general, during a downturn, revenue in absolute terms tends to decline in line with GDP, resulting in its ratio to GDP remaining unchanged. By contrast, government expenditure in absolute terms tends to increase, because of the greater social and other support needed, which accordingly adds to the ratio of expenditure-to-GDP, already pushed up by the reduction in economic output. See: Mourre, G., A. Poissonnier and M. Lausegger (2019), "The Semi-Elasticities Underlying the Cyclically-Adjusted Budget Balance: An Update & Further Analysis", European Economy Discussion Paper n. 098, Directorate-General for Economic and Financial Affairs, May.

considerably in scale, ranging from an increase of 3.2 pp in Ireland, to one of over 10 pp in Greece and Spain.

As the pandemic emergency comes under control and the economic situation improves, a progressive reduction in expenditure relative to GDP is expected as a result of both the withdrawal of the extraordinary measures put in place to contain the spread of the pandemic and the rebound in GDP (see Box 8.1 for a review of the effects of public expenditure and expansionary fiscal policy in general during the recent recessions).

Figure 8.5 General government expenditure and revenue, EU-27, 2004-2020



Source: Eurostat gov_10a_main

Box 8.1 The effects of government expenditure on growth during recessions

Calculating the impact of public expenditure on economic activity in the short-to-medium term involves estimating the 'fiscal multiplier', first conceived by John Maynard Keynes and defined as the change in output resulting from a given change in government expenditure, taxes or a combination of the two. The Great Recession of 2008-2009 sparked renewed interest in estimating the size of this multiplier. Interest was revived further by the recent pandemic-induced recession, the policy response and possible future developments.

Estimates of the multiplier vary over time and between economies and depend on the type of model applied and the assumptions incorporated in it.[1] In broad terms, the size of the multiplier seems to be affected by factors such as the presence of financial frictions, the credibility of the policy action concerned and its permanent or temporary nature, the composition of public spending, the presence or absence of market rigidities, the size of automatic stabilisers, the type of monetary policy in force, the degree of openness of the economy and the exchange rate regime.[2]

Most recent models suggest that the multiplier may be larger in periods of economic downturn than during economic expansion, as high as 2.5 compared to 0.6.[3] This is also corroborated by several empirical studies.[4]

This would imply not only that an expansionary fiscal policy is more effective in stimulating growth during a recession than previously thought, but also that fiscal consolidation at such times entails bigger downward pressure on economic activity. Furthermore, recent research highlights the importance of negative cross-border spill-over effects from fiscal consolidation through trade linkages which reinforce the negative impact of fiscal tightening on output.[5]

Both in 2008 and 2020, at the onset of the Great Recession and the COVID-19 crisis respectively, fiscal policy in the EU turned markedly expansionary, with public deficits increasing sharply in order to stimulate growth. In the years following the Great Recession, in the presence of a still depressed economy during the European sovereign debt crisis (from 2010 onwards), the fiscal policy stance in the EU reverted to being contractionary. Research suggests that this reduced output not only in the short term but also in the medium term, effectively prolonging and deepening the crisis.[6]

In the face of a sudden downturn, such as the one experienced as a consequence of the COVID-19 pandemic, an increase in public spending can have a significant effect on economic activity. This is particularly true in situations where the monetary policy stance is already expansionary (as it has been in the euro area since the Great Recession, and in particular from mid-2014 onwards), and therefore there is limited room for counteracting the crisis through further relaxing the policy.

In this context, in 2020, in reaction to the COVID-19 pandemic-induced recession, the EU and national governments injected a substantial amount of public resources into the economy, driving up public spending to historically high levels, and generating a large government deficit. In 2021, with the continued activation of the General Escape Clause, Member States could provide targeted and temporary fiscal support, while safeguarding fiscal sustainability in the medium term. As the pandemic emergency comes under control, they should gradually shift from a protective emergency response to measures that facilitate reallocation of resources, and support the recovery. When economic conditions allow, fiscal policies should aim at restoring prudent medium term fiscal positions and ensuring debt sustainability, while enhancing investment.

[1] See for instance: Perotti, R. (2005), "Estimating the effects of fiscal policy in OECD countries", CEPR Discussion Paper n. 4842, Centre for Economic Policy Research; Blanchard, O. and R. Perotti (2002), An empirical characterisation of the dynamic effects of changes in government spending and taxes on output, *The Quarterly journal of Economics*, 117(4):1329–1368; Beetsma, R., M. Giuliodori and F. Klaassen (2008), The effects of public spending shocks on trade balances and budget deficits in the European Union, *Journal of the European Economic Association*, 6(2-3):414–423; Barro, R. J. and C. J. Redlick (2011), Macroeconomic effects from government purchases and taxes, *The Quarterly Journal of Economics*, 126(1):51–102; Beetsma, R. and M. Giuliodori (2011), The effects of government purchases shocks: Review and estimates for the EU, *The Economic Journal*, 121(550):F4–F32.

[2] European Commission (2012), "The Quality of Public Expenditures in the EU", Occasional Papers n. 125, Directorate-General for Economic and Financial Affairs, December.

[3] Auerbach, A. and Y. Gorodnichenko (2013), Output spillovers from fiscal policy, *American Economic Review*, 103(3):141–146.

[4] See for instance: Corsetti, G., A. Meier and G. Müller (2012), What determines government spending multipliers?, *Economic Policy*, 27(72):521–565; Auerbach, A. and Y. Gorodnichenko (2012), Measuring the output responses to fiscal policy, *American Economic Journal*, 4(2):1–27; Baum, A., M. Poplawski Ribeiro and A. Weber (2012), "Fiscal Multipliers and the State of the Economy", IMF Working Papers n. 12/286, International Monetary Fund, December.

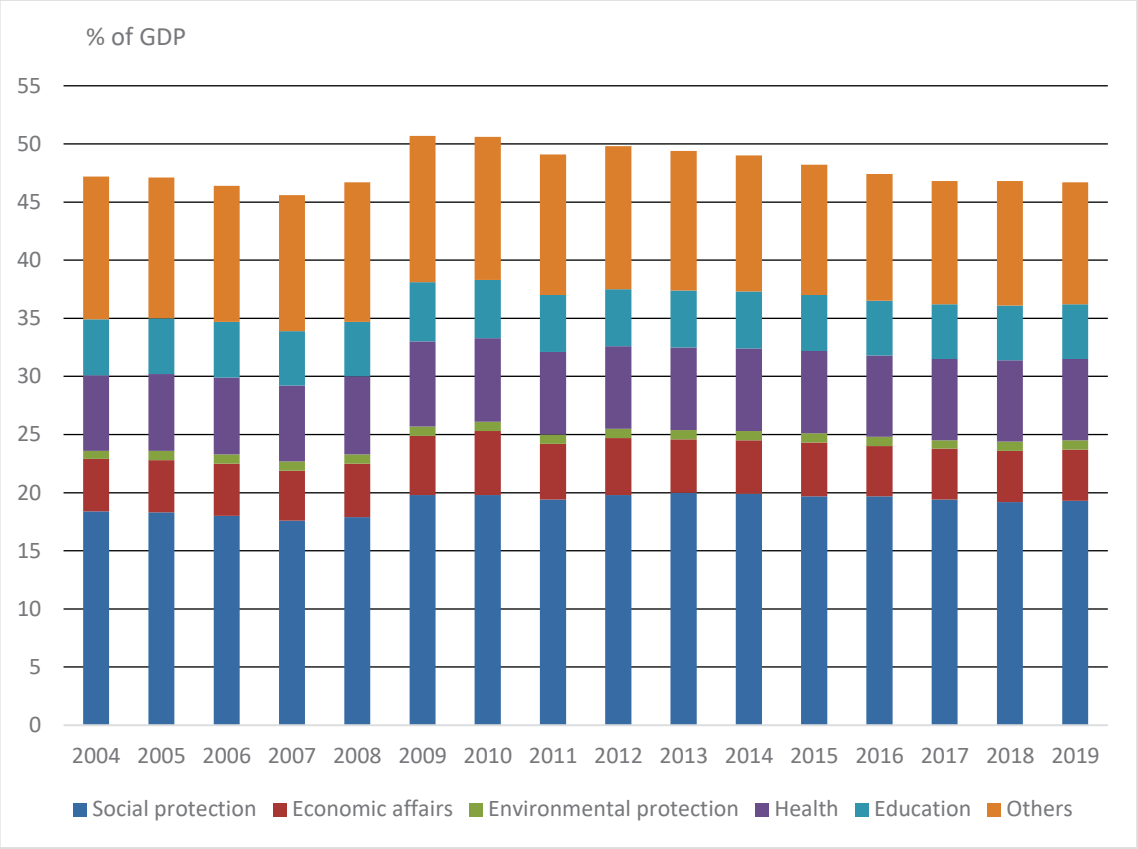
[5] See for instance: Goujard, A. (2017), Cross-Country Spillovers from Fiscal Consolidations, *Fiscal Studies*, 38(2):219–267; Poghosyan, T. (2020), Cross-country spillovers of fiscal consolidations in the euro area, *International Finance*, 23(1):18–46.

[6] DeLong, J. B., L. H. Summers, M. Feldstein and V. A. Ramey (2012), Fiscal Policy in a Depressed Economy [with Comments and Discussion], *Brookings Papers on Economic Activity*, SPRING 2012:233–297; Fatás, A. and L. H. Summers (2018), The permanent effects of fiscal consolidations, *Journal of International Economics*, 112:238–250; Fatás, A. (2019), Fiscal Policy, Potential Output, and the Shifting Goalposts, *IMF Economic Review*, 67:684–702; Gechert, S., G. Horn and C. Paetz (2019), Long-term Effects of Fiscal Stimulus and Austerity in Europe, *Oxford Bulletin of Economics And Statistics*, 81(3):0305–9049.

Turning to the composition of public spending by function and its evolution over time (see Box 8.2 for a description of the breakdown in government expenditure by function), it is notable that social protection expenditure accounts for the largest share in the EU-27 (Figure 8.6). In 2019 (the latest year for which complete data are available), it amounted to over 40% of total spending and just over 19% of GDP, almost 2 pp more than in 2007 (immediately before the Great Recession). The pandemic has undoubtedly led to an increase in social protection expenditure, but by how much remains to be seen.

Expenditure on economic affairs (including investment in transport and communications, in particular) remained relatively unchanged between 2007 and 2019, at just over 4% of GDP. The same is true of expenditure on education (just under 5% of GDP in 2019), and environmental protection (just under 1% of GDP throughout the period). By contrast, expenditure on health increased from around 6.5% in 2007 to 7% in 2019.

Figure 8.6 General government expenditure in selected policy areas, EU-27, 2004-2019



Source: Eurostat gov_10a_exp

Box 8.2 Methodological note: the Classification of Functions of Government (COFOG)

The Classification of Functions of Government (COFOG) was developed by the OECD and is applied to government expenditure and the net acquisition of non-financial assets (outlays). The Eurostat COFOG guide describes in detail the contents of each functional category.[1]

There is a 3-level classification with 10 'divisions' at the top level, each of which is broken down into 6-9 groups, which in turn are partly sub-divided further into 'classes'.

In this report, the 10 top-level divisions are re-grouped into the following 6 categories: Economic affairs (COFOG division 04); Environmental protection (division 05); Health (division 07); Education (division 09); Social protection (division 10), and Others (comprising divisions 01 'General public services', 02 'Defence', 03 'Public order and safety', 06 'Housing and community amenities', and 08 'Recreation, culture and religion').

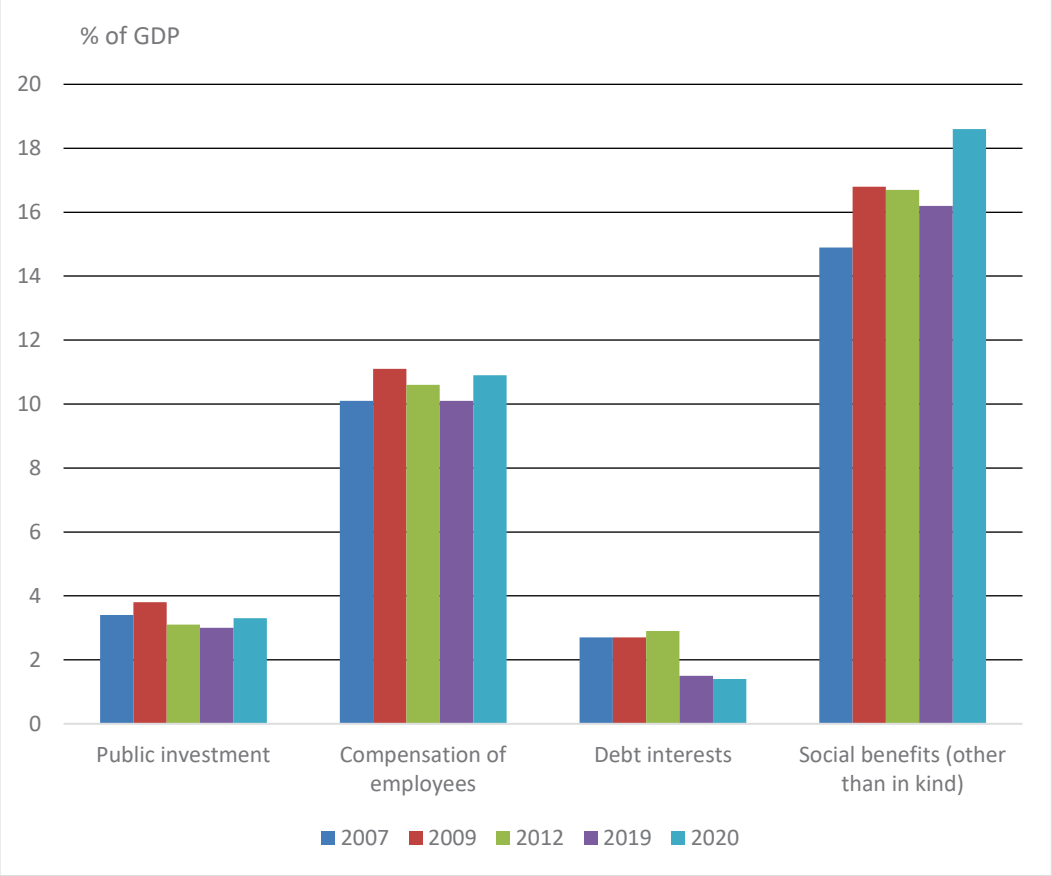
In addition, in some of the analysis, the COFOG Economic affairs division is sub-divided into the following 7 categories: Agriculture, forestry, fishing and hunting (COFOG group 04.2); Fuel and energy (04.3); Mining, manufacturing and construction (04.4); Transport (04.5); Communication (04.6); R&D Economic affairs (04.8); and Other (groups 04.1 'General economic, commercial and labour affairs', 04.7 'Other industries', and 04.9 'Economic affairs n.e.c.').

[1] Eurostat (2019), *Manual on sources and methods for the compilation of COFOG statistics – 2019 edition*, Luxembourg: Publications Office of the European Union.

Government expenditure can also be divided into current and capital expenditure. The former includes compensation of employees (wages and salaries), current transfers (such as social benefits) and interest payments on public debt. Capital expenditure mainly consists of gross fixed capital formation, or investment, though also capital transfers, primarily to support businesses.

Between 2007 and 2019, three main changes in the composition of expenditure occurred (Figure 8.7). First, spending on debt interest almost halved relative to GDP, mainly due to low interest rates but also to the reduction in government debt, and it declined even further in 2020. Second, expenditure on social benefits increased by 1.3 pp as a share of GDP, and rose by over 2.4 pp in 2020 reflecting the effects of the pandemic. Third, by contrast, government investment declined by 0.4 pp relative to GDP. In 2020, public investment rose again, and the expectation is that it will continue to increase, at least in the short-term, both in real terms and relative to GDP.

Figure 8.7 Selected categories of general government expenditure, EU-27, 2007, 2009, 2012, 2019 and 2020



Source: Eurostat gov_10a_main

8.3.3 Public investment evolved unevenly across Member States, and it has not recovered yet from the financial crisis of 2008-2009

There is consensus in the economic literature that efficient regulation, an effective and well-functioning public administration, and well-targeted public investment are all essential for the functioning of modern economies by providing critical infrastructure and public services, ensuring respect for the rule of law and enforcing property rights. Services such as healthcare and education and the related infrastructure and facilities, as well as investment in transport, environmental protection and support for R&D are important for sustainable and inclusive growth over the long term. All of these are likely to experience either a socially inequitable allocation of resources or significant under-spending if left to market forces.

Public investment has a particularly important role in growth as it contributes to increasing and renovating the stock of fixed assets (such as buildings, infrastructure and facilities to deliver services) that will affect the trajectory of economic development, and growth prospects, over the long-term.

Public investment can act as an important stimulus to the economy during a period of recession when the private sector is reluctant to invest. It also can have significant cross-border effects on growth, with trade linkages in the single market spreading economic gains across the EU economy. A reduction in public investment is, therefore, a cause for concern. Cohesion policy funding increases public investment in Member States, especially less developed ones that may have less fiscal space for expenditure, in compliance with the principle of additionality (see Box 8.3). It is, accordingly, an important lever for post-crisis economic rebalancing and recovery.

Box 8.3 The principle of additionality in ESI Funds

Definition

The ESIF regulations for 2014-2020 stipulate that the support they provide should be additional to, and not replace, public or equivalent structural expenditure by Member States (i.e. nationally-funded government gross capital formation or investment). Over the entire programming period, therefore, Member States need to maintain a level of public or equivalent structural expenditure at least equal to the reference level set in the Partnership Agreement at the beginning of the period. Going forward, this holds true also for the new generation of cohesion policy funds 2021-2027.

Member States subject to verification in 2014-2020

The regulations also stipulate that the verification of the additionality principle shall only take place in those Member States in which less developed regions cover at least 15% of the total population, because of the scale of the financial resources allocated to them. In Member States in which less developed regions cover at least 65% of the total population, the verification is to take place at national level. In those where they cover more than 15% and less than 65%, it is to take place at regional level. Meaning, it is focused on the regions receiving most support.

In the period 2014-2020, 11 Member States were subject to additionality verification at national level (Bulgaria, Czechia, Estonia, Croatia, Latvia, Lithuania, Hungary, Poland, Portugal, Romania, and Slovakia), and three Member States at regional level (Greece, Italy, and Slovenia).

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Verification process

The verification of the additionality principle takes place at three different times over the 2014-2020 funding cycle: (i) at the time of submission of the Partnership Agreement (ex-ante verification), (ii) in 2018 (mid-term verification), and (iii) in 2022 (ex-post verification).

The planned profile of public structural expenditure needs to be included in the Partnership Agreements. Once approved, the figures concerned are taken as the reference level of expenditure to be maintained over the 2014-2020 period. In sum, the verification procedure consists of comparing the average level of gross fixed capital formation as a percentage of GDP, as reported in the Stability and Convergence programmes submitted as part of the European Semester, with the reference levels reported in the Partnership Agreements (where verification occurs at the regional level, the level of gross fixed capital formation in the less developed regions is used). A Member State is deemed to have complied with the principle of additionality if the annual average structural expenditure is equal to or higher than the reference level.

The mid-term verification is purely for monitoring purposes; no financial corrections are foreseen at this stage should non-compliance with the additionality principle be detected. Member States that are found not to comply are invited by the European Commission to step up public investment in order to comply ex post. The Commission can also revise the reference level of public structural expenditure in the Partnership Agreement, in consultation with the Member State concerned, if the economic situation has changed significantly from that estimated at the time of adoption of the Partnership Agreement.

In case of non-compliance ex post, the Commission can decide to implement a financial correction, which has not to exceed 5% of the funding originally allocated to the less developed regions concerned for the programming period.

State of play

Mid-term verification of the additionality principle for the period 2014-2020 took place between 2018 and 2019. At the end of the process, Bulgaria, Italy, and Romania were deemed not to be compliant. As a consequence, in autumn 2019, the Commission informed the respective authorities that they would have to increase public investment to reach the levels needed. The ex-post verification in 2022 will take account of any significant changes in the economic situation since the mid-term verification, including as a result of the COVID-19 pandemic-induced recession and the public policy responses.

With the exception of 2009, which was the peak of efforts to moderate the economic downturn, there was a general decline in public investment relative to GDP over the period 2008 to 2019 (Figure 8.8). This suggests that public investment never recovered from the 2008-2009 financial crisis, giving cause for concern about the consequences that depressed levels of investment might have on growth over the medium and longer-term. The pandemic may well have reduced public investment further.

Public investment declined more over the 2008-2019 period in Cohesion countries (from 4.9% of GDP to 3.8%) than in Non-Cohesion countries (from 3.3% to 2.9%). This implies that countries most

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in need of the investment are the ones reducing it most, with potential adverse consequences for the pace and sustainability of their convergence towards the EU average level of GDP per head.

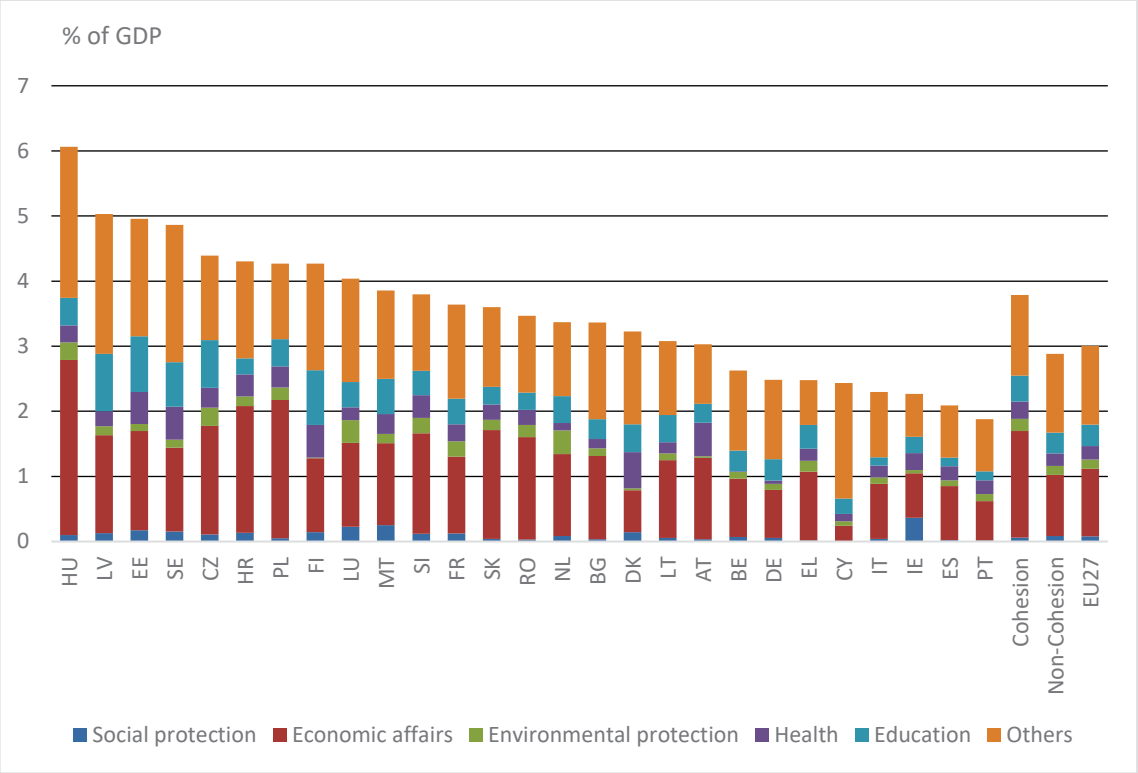
In geographical terms, the largest decline in public investment was in the southern countries (by 1.7 pp relative to GDP), followed by the eastern countries (0.7 pp); while there was less change in north-western ones, except for Ireland. In Greece, Romania and Ireland, the decline was about 3 pp; in Spain, Lithuania, and Bulgaria, over 2 pp. The high level of public debt may have contributed to constraining public investment in Greece and Spain, but in the other countries listed, debt was considerably lower.

Figure 8.8 Total general government investment, 2008, 2012, 2016, and 2019

Source: Eurostat gov_10a_main

A third of total government investment in the EU goes to the COFOG category of economic affairs (covering energy, transport, and communications in particular), which alone amounted to 1% of GDP in 2019 (Figure 8.9). In Cohesion countries, the figure is significantly larger - 1.6% of GDP, though varying from 2.7% of GDP in Hungary to just 0.2% in Cyprus.

Figure 8.9 Total public investment in selected policy areas, 2019



Source: Eurostat gov_10a_exp

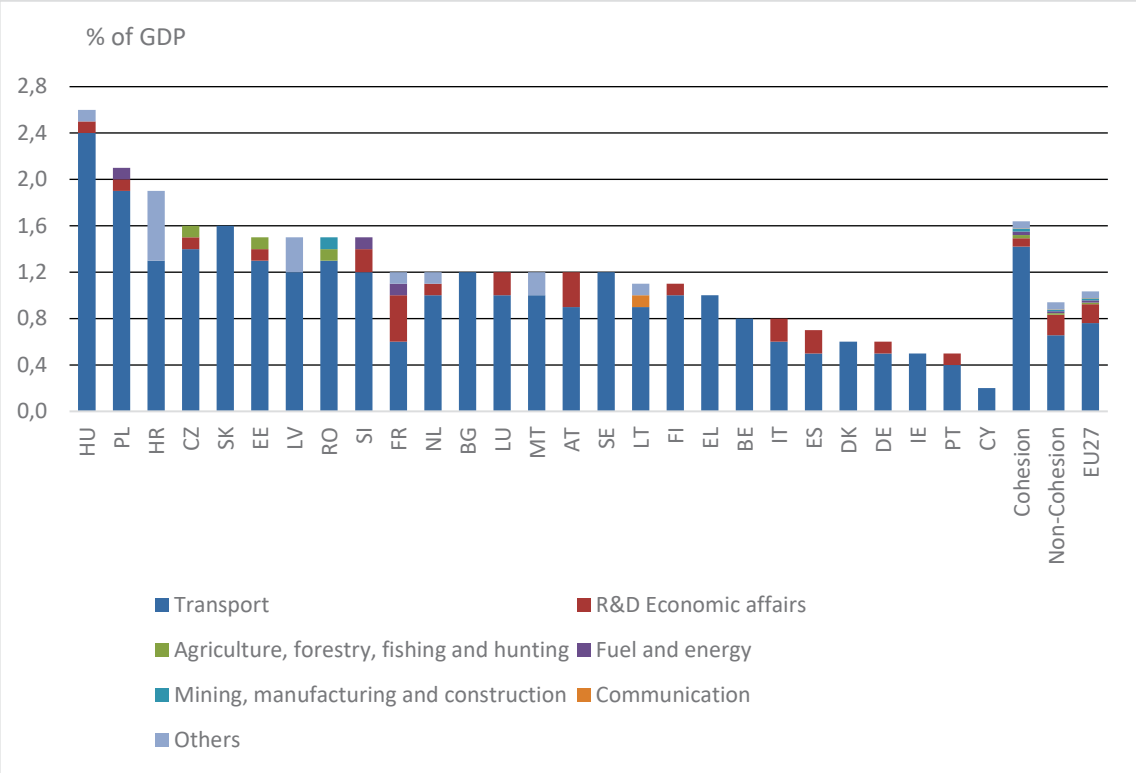
Within the economic affairs category, a large part of the investment goes to transport, amounting to 0.8% of GDP in 2019 in the EU); and in all Member States, it was the largest area of investment in the category, ranging from 2.4% of GDP in Hungary to 0.2% in Cyprus (Figure 8.10).

In Cohesion countries, transport investment accounted for just under 1.4% of GDP, twice the figure in Non-Cohesion ones, reflecting ongoing construction of transport networks, which should support economic development and convergence.

Public investment in R&D is an important growth-enabling factor and the second largest component of investment in the economic affairs category in the EU-27, at just under 0.2% of GDP in 2019. The largest expenditure was in France (0.4% of GDP), followed by Austria (0.3%).

In contrast to investment in transport, Non-Cohesion countries invested almost twice as much of their GDP in R&D as Cohesion ones (0.2% as against 0.1%). The relatively low level of investment could be detrimental to their innovation capacity and their ability to sustain growth in the medium and long term.

Figure 8.10 General government investment in selected areas in the Economic affairs category, 2019



Source: Eurostat gov_10a_exp

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Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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8.1 Sub-national public finance and decentralisation

8.1.1 Sub-national governments implement a large share of public expenditure, but with marked differences across the EU

This section focuses on government expenditure and revenue at the sub-national level – i.e. by regional and local authorities, and state governments in federal Member States – and the changes that have occurred in recent years, including in relation to the COVID-19 pandemic.

When considering sub-national finances, it is important to note that the figures for public investment or other expenditure carried out by sub-national governments and the revenue they collect include the amounts channelled through them by other general government sub-sectors, namely the central government. The authorities concerned may be responsible for managing spending or collecting revenue but may have limited autonomy over the underlying policy, investment or taxation decisions. A separate section below assesses the extent of autonomy which regional and local authorities have.

Similarly to the trends observed for government finances as a whole, the expenditure executed by or channelled through sub-national authorities in the EU behaves in a counter-cyclical way relative to GDP and tends to increase as the latter falls. Apart from the recession years, sub-national public spending appears to have been relatively stable over the period 2004-2019 at 15-16% of GDP (Figure 8.11). It increased sharply, however, in 2020, jumping by 1.6 pp relative to GDP as an immediate consequence of the pandemic. All Member States, except Hungary, experienced a rise, and it was particularly pronounced in Spain (over 3 pp relative to GDP), Germany and Belgium (over 2 pp) between 2019 and 2020.

Sub-national revenue was equally stable over the period 2009-2019 at around 9-10% of GDP, a much lower level than expenditure, a difference that is reduced at least partially by transfers from the central government. The overall revenue trend shows a slight increase since the years immediately preceding the Great Recession. This may reflect a small increase in the decentralisation of revenue-collection, a possible increase in fiscal autonomy of sub-national authorities, or an increase in the tasks delegated to them.

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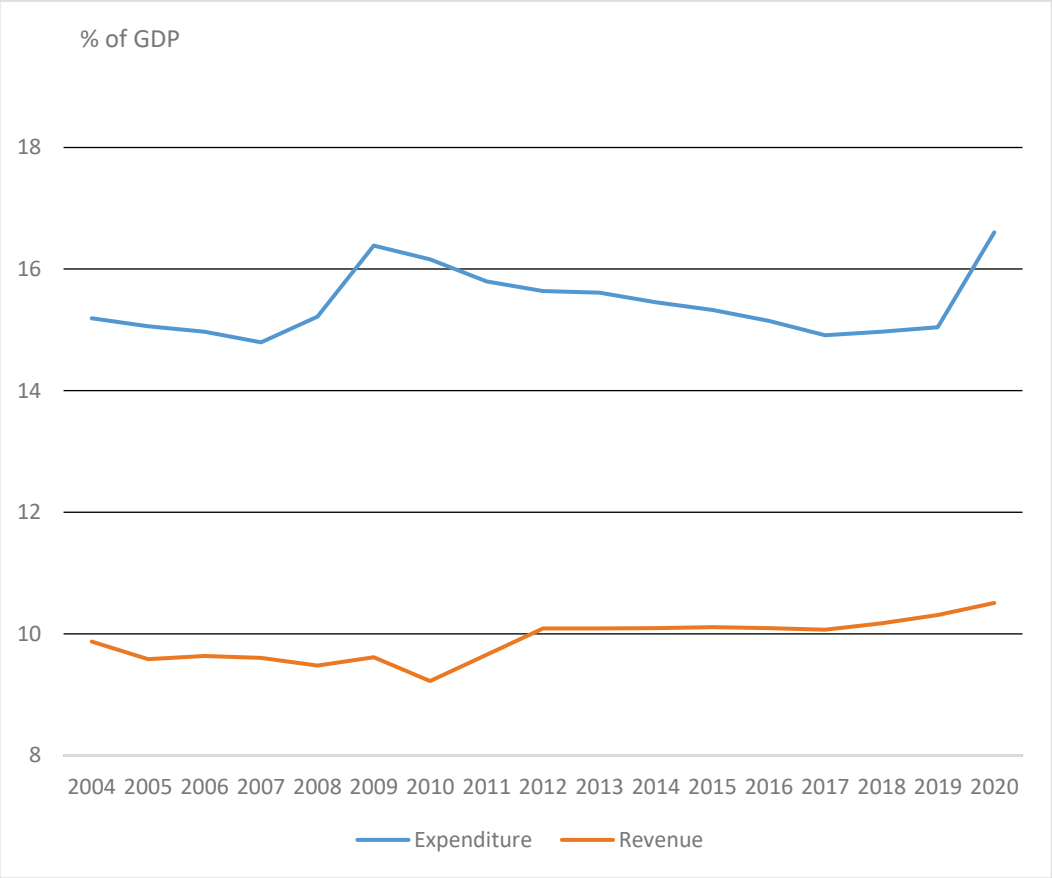
Figure 8.11 Sub-national expenditure and revenue, EU-27, 2004-2020



Source: Eurostat gov_10a_main

A significant proportion of public expenditure is executed by sub-national authorities across the EU (Figure 8.12). In the EU-27, in 2019, it was around one third (32%) and it was broadly unchanged over the preceding 11 years.

There are, however, considerable variations between Member States, reflecting differences in the institutional setting. The proportion of expenditure executed by sub-national authorities is largest in federal countries (Austria, Belgium and Germany) and in countries where government is highly decentralised (Spain, Denmark, Finland, and Sweden). In Denmark, 65% of expenditure was executed by sub-national authorities in 2019, while it was over 50% in Sweden, and over 40% in Spain, Belgium, Finland and Germany. By contrast, in Cyprus and Malta, sub-national authorities executed less than 5% of expenditure and in Greece, Ireland and Luxembourg, only about 10% or less.

Although the proportion of expenditure executed by sub-national authorities has been relatively stable over time in most countries, there are some exceptions. Between 2008 and 2019, the proportion increased by more than 8 pp in Belgium, more than 4 pp in Sweden, more than 3 pp in Poland, while it fell by more than 2 pp in 7 Member States of which by more than 8 pp in Hungary and 6 pp in Ireland. More recently, between 2016 and 2019, it increased by around 3 pp in Poland, Czechia and Slovakia, and it fell by over 3 pp in Romania, the only country where it declined significantly over this period.

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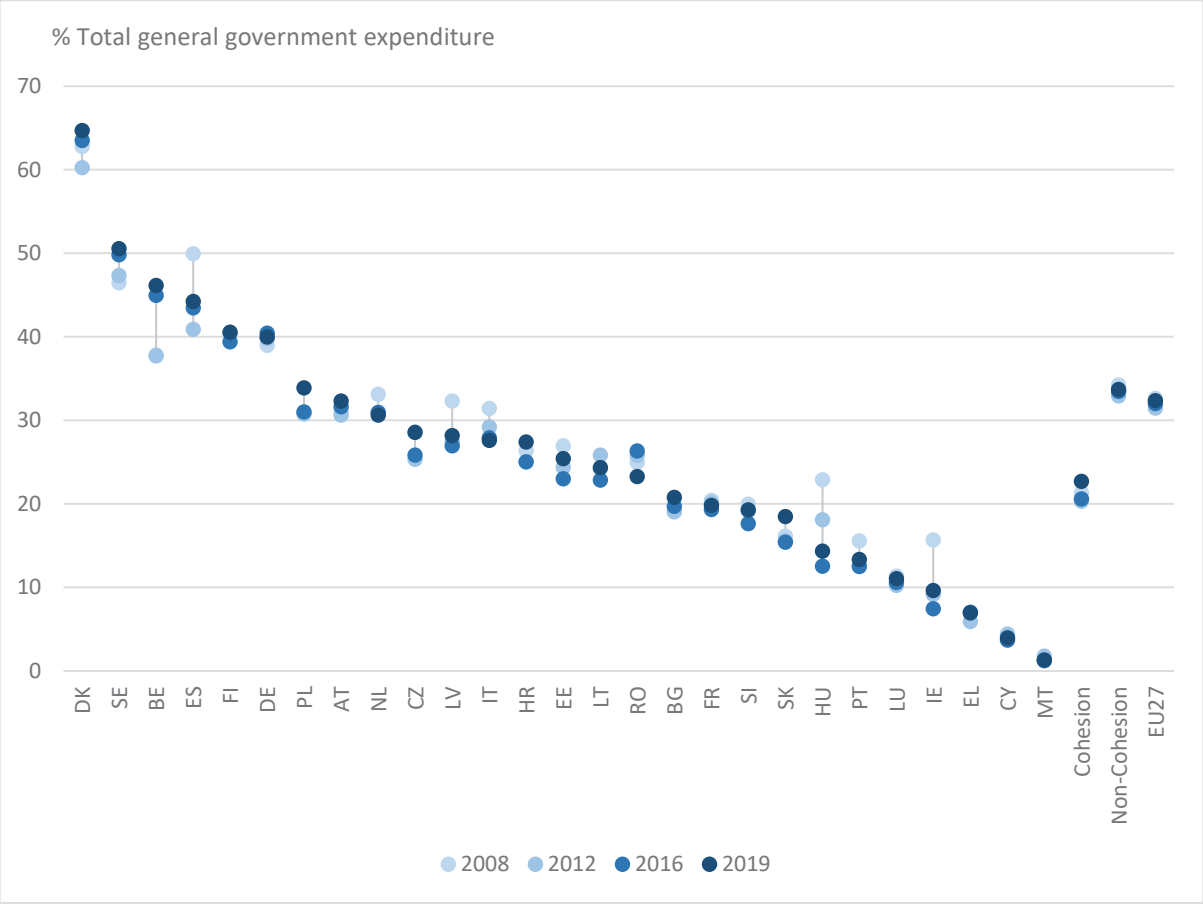
Figure 8.12 Sub-national government expenditure, 2008, 2012, 2016, 2019



Source: Eurostat gov_10a_main

Overall, there tends to be markedly less decentralisation of expenditure in Cohesion countries than Non-Cohesion ones (the share of sub-national expenditure being 23% in the former in 2019 as against 34% in the latter). However, there are signs of a possible increase in decentralisation, with the proportion of sub-national expenditure in Cohesion countries rising by 2.1 pp in the three years up to 2019 (as against a rise of just 0.2 pp in Non-Cohesion ones).

The expenditure of sub-national authorities is concentrated in particular policy areas. In the EU as a whole, in 2019, almost 50% went to education, health, environmental protection and economic affairs (predominantly transport) compared with 36% in the case of total government expenditure.[1] There are again significant variations between Member States. In Estonia, Lithuania, Croatia, Czechia, Slovenia and Italy, over 65% of sub-national expenditure went to the areas listed above, while relatively little did so in Malta and Cyprus.

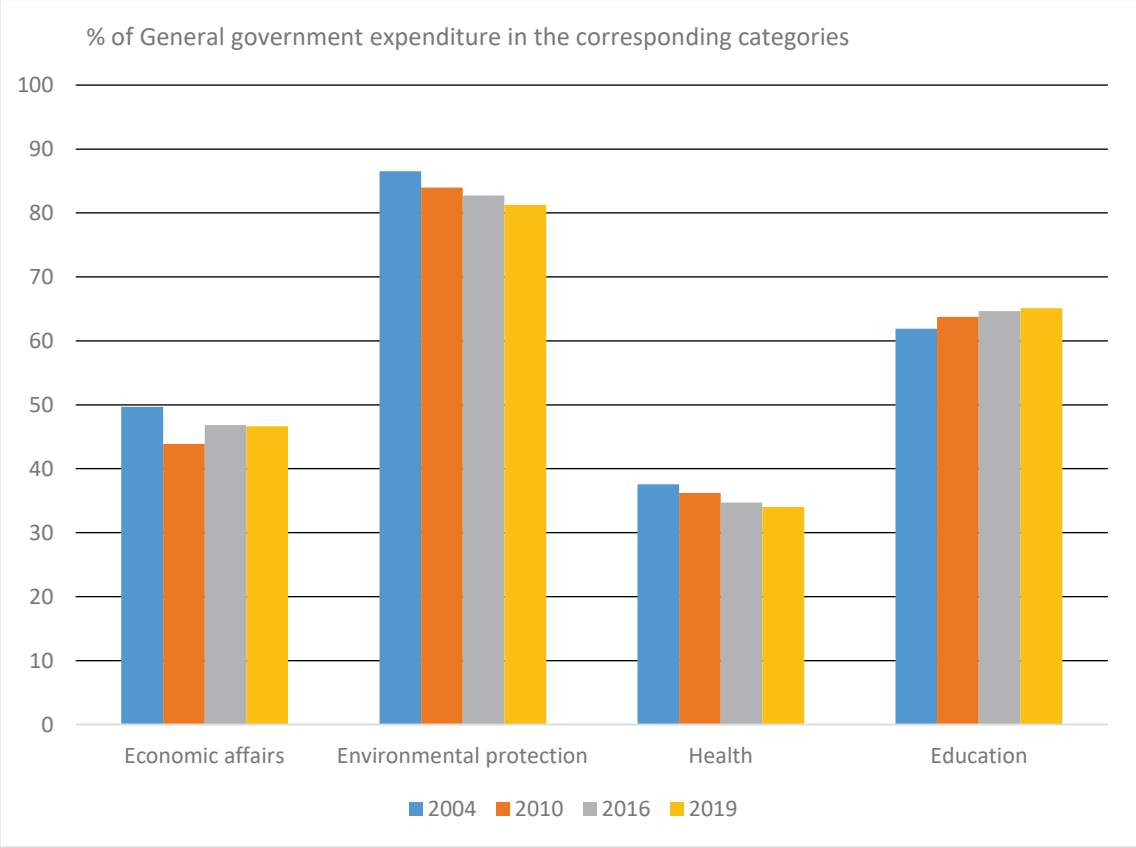
[1] Note that, in the COFOG classification used in the analysis, transfers of a general nature between government sub-sectors are included within division 01 'General public services' included under the category Others.

In 2019, sub-national authorities executed over 80% of public spending on environmental protection, and over 65% of education expenditure, as well as 47% of spending on economic affairs, and over a third of expenditure on healthcare (Figure 8.13).

In some Member States, public expenditure in these areas is almost entirely executed by sub-national authorities. In particular, over 90% of expenditure on environmental protection occurred at the sub-national level in 2019 in Italy, the Netherlands, Spain and Lithuania, over 90% of spending on healthcare in Italy, Denmark, Sweden and Spain, and over 90% of education expenditure in Belgium, Germany and Spain.

Between 2004 and 2019, sub-national expenditure on environmental protection and healthcare declined as a share of total public spending in these areas, though the total increased as a share of GDP, indicating more expenditure being carried out by the central government. At the same time, however, the sub-national share of expenditure on education increased by over 3 pp.

Figure 8.13 Sub-national government expenditure in selected policy areas, EU-27, 2004, 2010, 2016, 2019



Source: Eurostat gov_10a_exp

As at the overall level, social protection was the largest area of expenditure executed by or channelled through sub-national authorities in the EU-27 in 2019, at 3.5% of GDP, followed by education, 3%, healthcare and economic affairs, each just over 2%. Expenditure on environmental protection amounted to just 0.6% of GDP (Figure 8.14).

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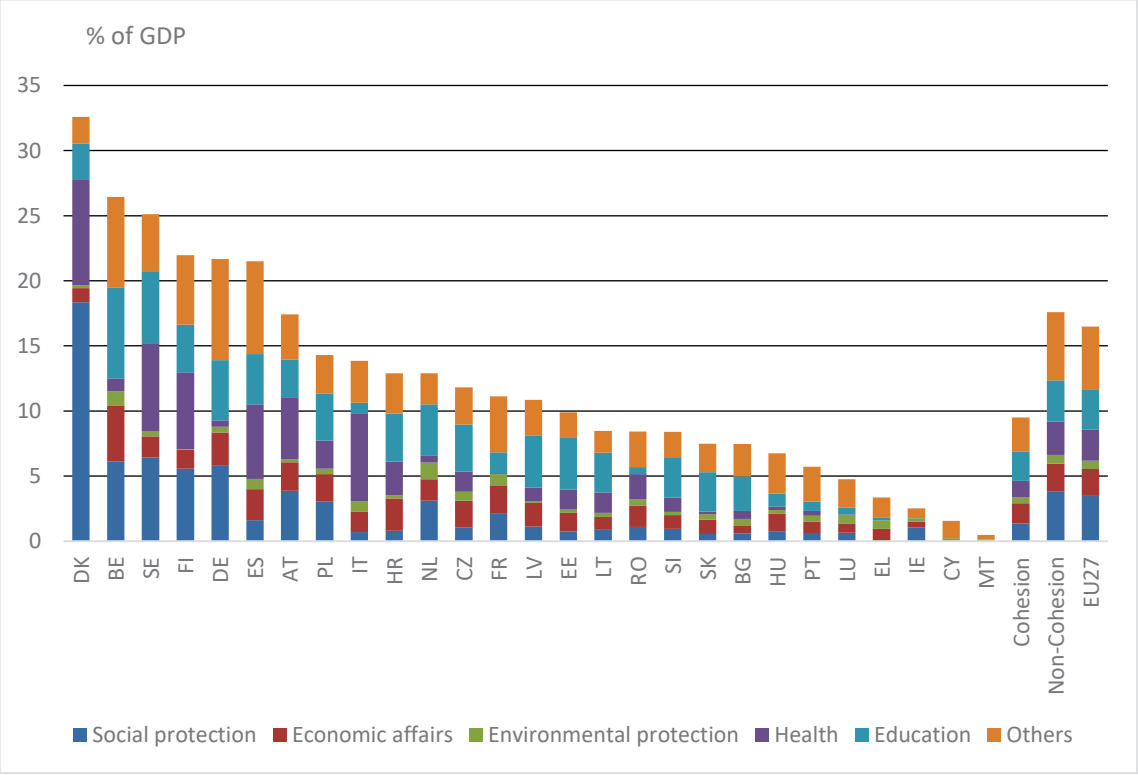
There is again considerable variation between Member States. Overall, the expenditure executed by sub-national authorities was over 8 pp lower relative to GDP in Cohesion countries (9.5%) than in Non-Cohesion ones (17.6%). Spending in all areas was lower in the former, especially on social protection (2.4 pp lower), healthcare (1.3 pp lower), and education (0.9 pp lower).

In individual countries, sub-national expenditure on social protection ranged from over 18% of GDP in Denmark, close to 6% in Sweden, Belgium, Finland, and Germany to only around 1% or below in 16 Member States and zero in Malta and Cyprus. Education expenditure by sub-national authorities was close to 7% of GDP in Belgium, and 4% or above in Sweden, Germany, Latvia, the Netherlands, Estonia and Spain, but well below 1% in Hungary, Italy, Portugal, Luxembourg, Romania, Greece and Ireland, and again zero in Cyprus and Malta. Healthcare expenditure was around 6% of GDP in Denmark, Sweden, Italy, Finland, and Spain, but well below 1% in Bulgaria, Germany, the Netherlands, Portugal, Hungary and Slovakia, France and Luxembourg and zero in Ireland, Greece, Cyprus, and Malta. These variations reflect both the differing responsibilities of sub-national authorities for spending in different areas and differing structures of governance.

Figure 8.14 Sub-national government expenditure in selected policy areas, 2019



Source: Eurostat gov_10a_exp

8.1.2 Sub-national governments undertake the majority of public investment

Sub-national authorities have a major role in carrying out public investment. In 2019, their spending on investment (gross fixed capital formation) was 1.7% of GDP in the EU-27, or 58% of total public investment (Figure 8.15).

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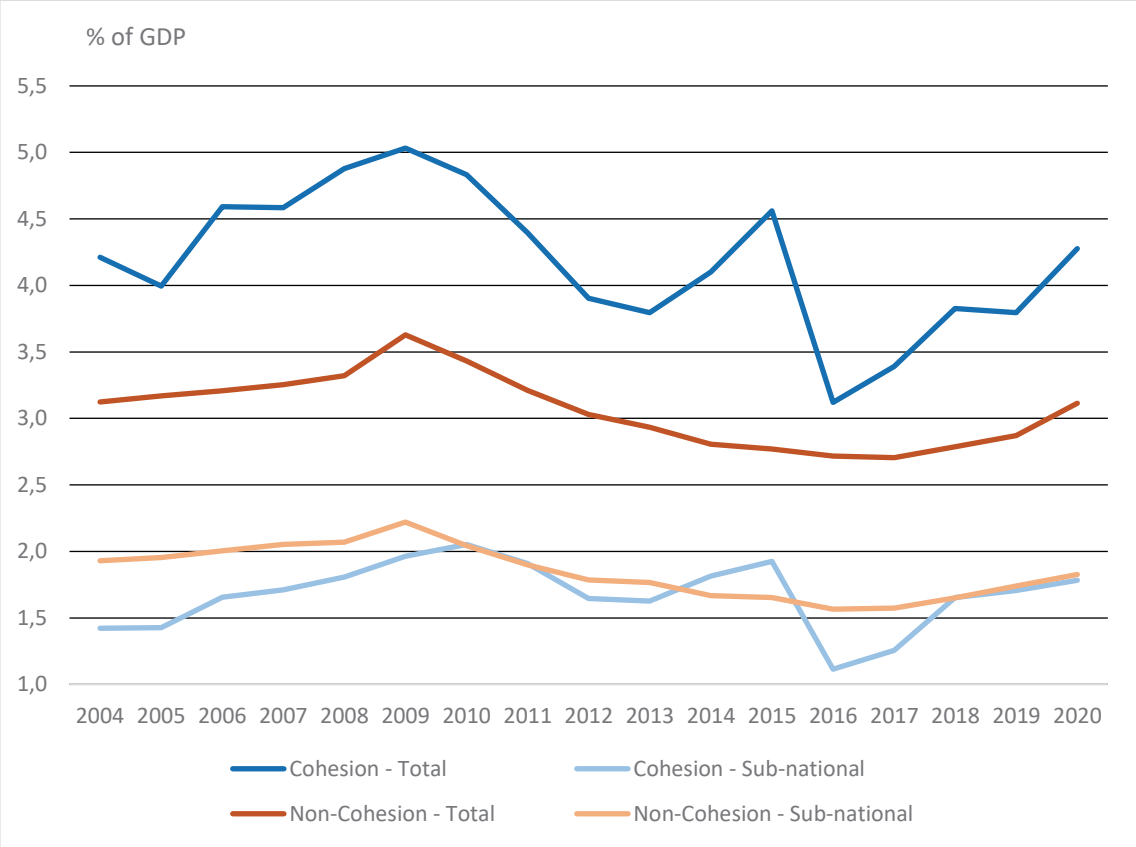
While their spending on investment has generally varied pro-cyclically in relation to GDP, declining during economic downturns as in the case of overall government investment, the variation has been more pronounced in Cohesion countries than in Non-Cohesion ones.

Sub-national expenditure on investment was approximately the same relative to GDP in both Cohesion and Non-Cohesion countries in the three years 2018-2020, increasing in the former back to the same level as in 2004 and in the latter remaining slightly below the level. At the same time, the sub-national share of public investment is much smaller in Cohesion countries, though the difference progressively narrowed by almost a half between 2004 and 2020.

Figure 8.15 Sub-national and total public investment, 2004-2020



Source: Eurostat gov_10a_main

In 2019, public investment carried out by sub-national authorities was particularly high relative to GDP in Sweden and Finland (just under 3% in both); over 2% in 7 other Member States (Latvia, Croatia, France, Poland, Belgium, Czechia and Romania), but below 1% in Portugal, Ireland, Greece, Cyprus and Malta. In general, countries with relatively low sub-national investment levels also have low total expenditure at the sub-national level (Figure 8.16).

In 16 Member States, sub-national public investment was lower relative to GDP in 2019 than in 2008; most notably in Ireland (2.3 pp lower) and Spain (1.6 pp lower) and to only a slightly lesser extent in Latvia, Portugal and Lithuania. It was higher in 2019 in 11 Member States, especially in

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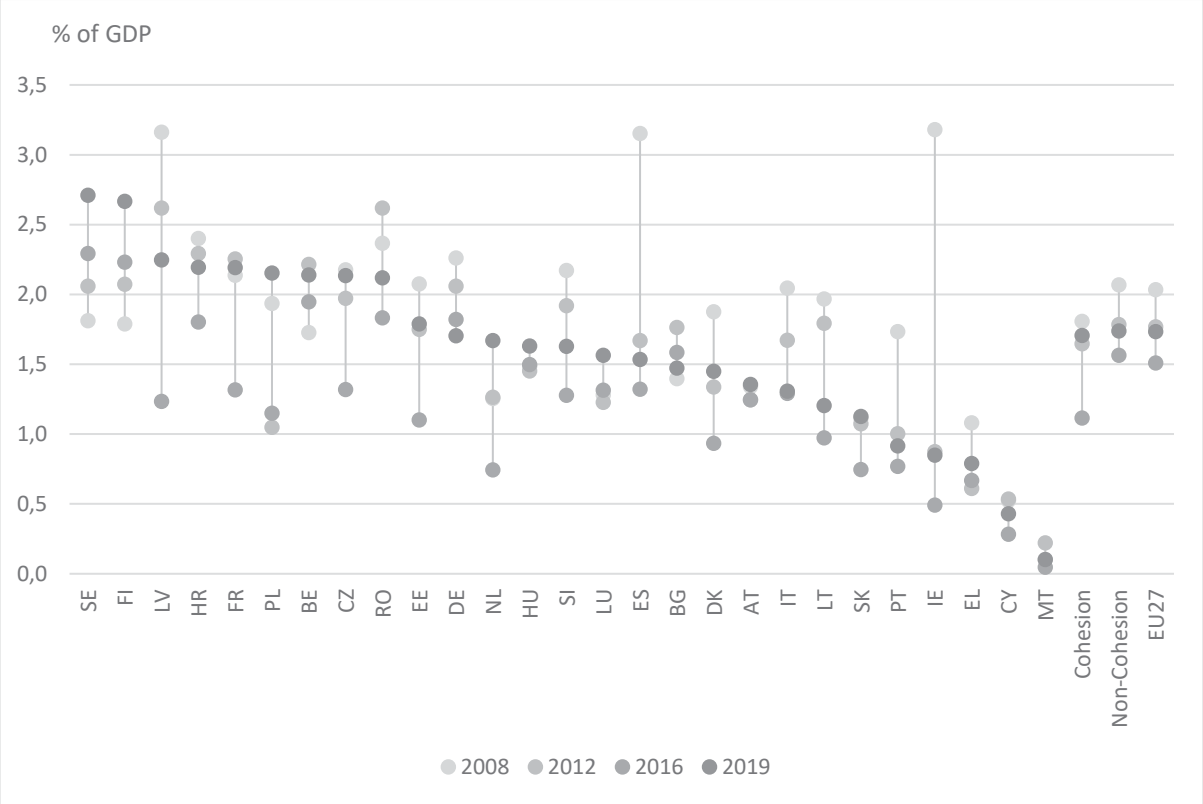
Sweden and Finland. Box 8.4 reports the results of a pilot project on regional (NUTS2) public investment.

Figure 8.16 Sub-national government public investment, 2008, 2012, 2016, 2019



Source: Eurostat gov_10a_main

Box 8.4 Measuring regional public investment: a pilot project

Public investment plays a key role in reducing regional disparities. It is essential to the smooth functioning of modern economies by providing essential public infrastructure and public services. These will not be supplied by the private sector and they are key factors of long-term growth. Transport infrastructure, for example, is almost entirely financed through public investments. Public investment includes support to R&D and innovation which are important engines of growth. Public investment is also needed to address challenges linked to climate change, demographic change, urbanisation and digitalisation. Overall, public investment shapes people's choices about where to live and work, influences the nature and location of private investment, and affects quality of life.

Public investment can help less developed regions catch up. These regions typically lag behind in terms of basic infrastructure, R&D and innovation performance, capacity to mitigate the impact of climate change, and capacity to attract private investment. As a result, measuring regional public investment is crucial to support territorial development policies, such as cohesion policy. That is why a Eurostat pilot project was launched in 2020 to test the feasibility of collecting those data. The overall aim is to agree on a harmonised methodology and produce annual data on public investment per NUTS2 region.

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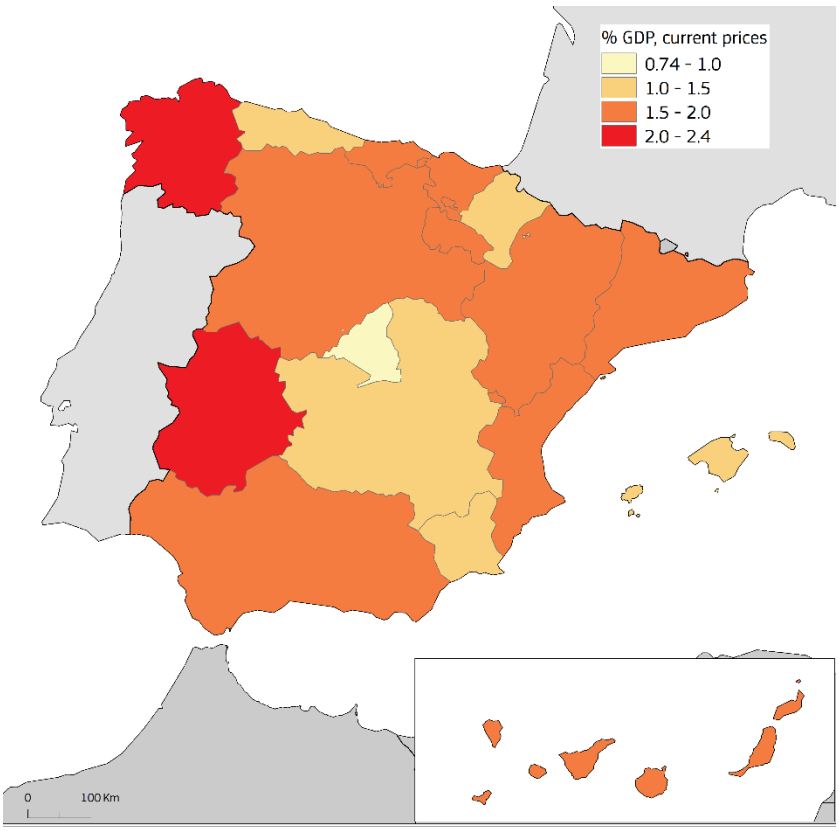
As part of this project, a regional breakdown of public investment (gross fixed capital formation) by regional and local governments, but not central government, was collected for Spain (Map 8.1). These figures show that public investment by these two levels of government varies widely from one region to another. It is the lowest at 0.7% of GDP in the capital region of Madrid and the highest in the less-developed region of Extremadura at 2.4%. The transition regions in north-eastern Spain tend to have relatively high investment levels, while some of the less developed regions in the centre and south of the country exhibit below average values.

Map 8.1 Gross fixed capital formation by state and local governments in Spain, average 2014-2017



Gross fixed capital formation by state and local governments in Spain, average 2014-2017

Source: Eurostat pilot project on regional public investments and Eurostat data (nama_10r_2gdp)

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For Poland (Map 8.2), a regional breakdown of the public investment by all levels of government is available. Public investment varies between 6.8% of GDP in the north-east region of Warmińsko-Mazurskie and 3.2% in the Warsaw capital region. In general, public investment as a share of GDP is markedly higher in less developed regions than in more developed ones, but with some nuances; for instance, less developed regions in the south-east of the country have less public investment than comparatively more advanced regions in the north-west.

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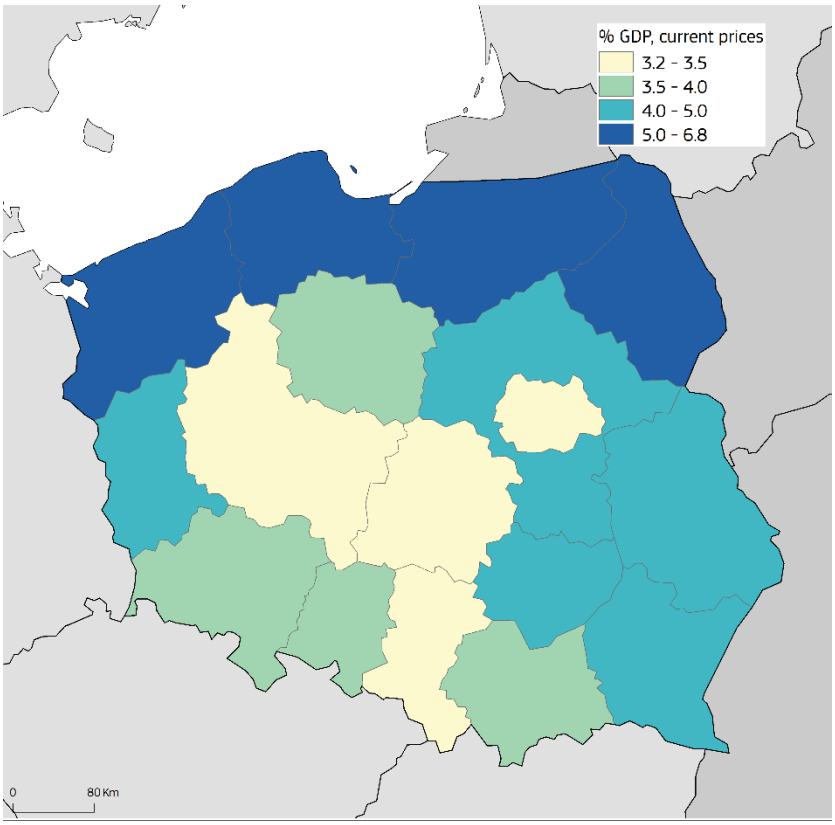
Map 8.2 General government gross fixed capital formation in Poland, average 2016-2018



General government gross fixed capital formation in Poland, average 2016-2018

Source: Eurostat pilot project on regional public investments and Eurostat data (nama_10r_2gdp)

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8.1.3 Regional and local autonomy

As emphasised above, the amount of expenditure undertaken by sub-national authorities and the amount of revenue collected is not necessarily a reflection of their autonomy in policy-making. Regional and local autonomy is an important factor in promoting place-based policies.

Two indicators, derived from the Regional Authority Index (RAI) and the Local Autonomy Index (LAI), provide a better gauge of this by measuring the extent of regional and local "self-rule".[2] The indicators, one for regional authorities and one for local, cover five dimensions: institutional autonomy; policy autonomy; fiscal autonomy; borrowing autonomy; representation or organisational autonomy.[3] A specific indicator for metropolitan regions is calculated separately (see Box 8.5).

[2] The RAI measures the extent of self-rule and shared rule exercised by regional governments in their countries (Hooghe, L., G. Marks, A. H. Schakel, S. Niedzwiecki, S. Chapman Osterkatz and S. Shair-Rosenfield (2016) (eds.), *Measuring Regional Authority. A Postfunctionalist Theory of Governance, Volume I*, Oxford: Oxford University Press); the LAI measures the extent of self-rule and interactive rule exercised by local authorities (Ladner, A., N. Keuffer H. and Baldersheim (2015), *Local Autonomy Index for European countries (1990-2014). Release 1.0*, Brussels: European Commission). Both indexes are based on expert judgement. The indicators used in this section reflect only the self-rule components of RAI and LAI.

[3] Institutional autonomy is the extent to which a regional or local government is formally autonomous with respect to higher levels of government; policy autonomy relates to the range of policies (or functions) for which a regional (local) authority is responsible; fiscal autonomy is the extent to which a regional or local government can independently levy

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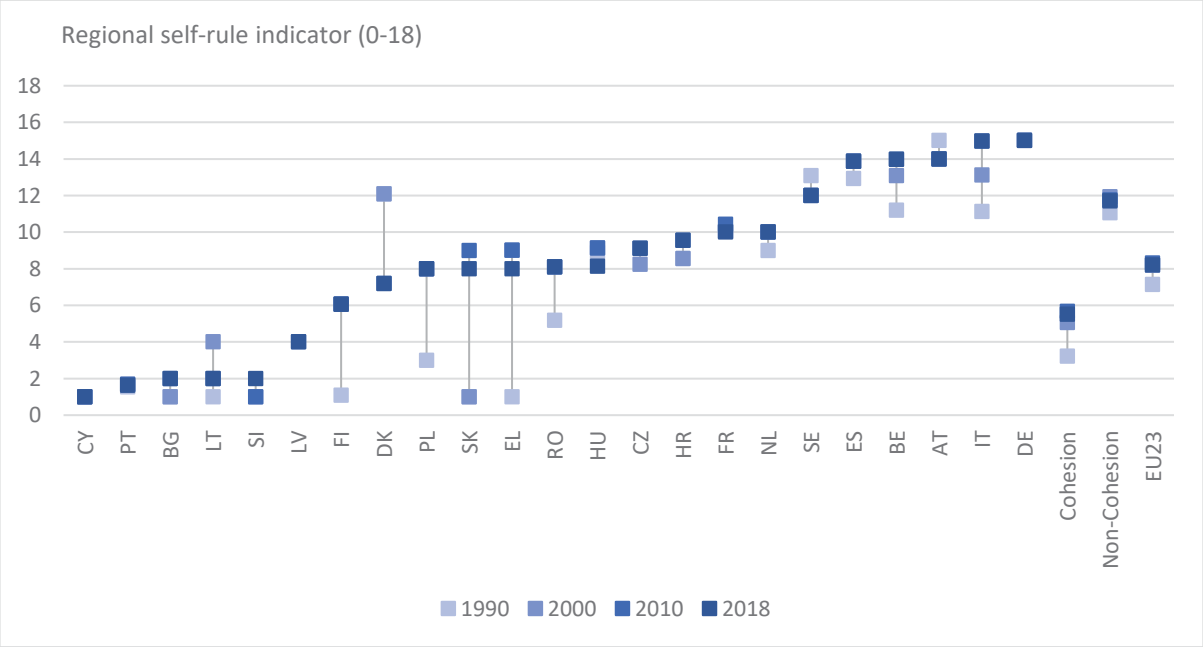
In the 23 EU Member States with regions as defined in the regional self-rule indicator (see note to Figure 8.17), the level of regional autonomy has increased on average over the past three decades, with most of the increase occurring between 1990 and 2000.

Between 1990 and 2018, the indicator increased in 14 Member States, with Lithuania, Slovakia and Greece showing some reduction over the past decade after increasing earlier. The indicator remained broadly unchanged in 5 Member States (Cyprus, Portugal and Latvia at relatively low levels, and France and Germany at high levels), and declined in the remaining four, with small reductions in Sweden, Austria and Hungary between 2000 and 2010 and a more marked decline in Denmark.

The Member States with most regional autonomy are the federal countries (Austria, Belgium and Germany), together with the highly devolved states of Spain and Italy (all of which score 14 or 15 out of 18 on the indicator). At the other end of the scale are the unitary states of Cyprus, Portugal, Bulgaria, Lithuania and Slovenia (with a score of just 1 or 2 out of 18), with Latvia having a slightly higher level of regional autonomy (with a score of 4).

Decentralisation helps to support integrated place-based policies, which are particularly important in large countries with significant internal disparities. Cohesion countries, to some extent reflecting their generally smaller size, have, on average, a much lower level of regional autonomy than Non-Cohesion ones (their average score is 6 out of 18 in 2018, as against 11.5 for the latter). The difference narrowed between 1990 and 2010, but then widened slightly from then until 2018.

Figure 8.17 Regional self-rule indicator, 1990, 2000, 2010, 2018



taxes; borrowing autonomy is the extent to which a regional or local government can borrow; representation relates to the extent to which a region has an independent legislature and executive, and organisational autonomy, in the case of local authorities, is the extent to which they are free to decide about their own organisation and electoral system. Each indicator assumes values ranging from 0 to 18.

Source: DG REGIO calculations based on RAI v.3.1 scores for the highest regional authority tier in a country (https://garymarks.web.unc.edu/data/regional-authority-2/)
Note: MT, IE, LU and EE have no regions as defined by the RAI; the first year is 1991 for BG and RO, 1993 for HR, 1995 for LT and 1996 for SK.

Box 8.5 Self-rule authority in metropolitan regions

The regional self-rule indicator, which measures the authority exercised by a regional government over those who live there, is calculated separately for metropolitan regions in the EU. This throws further light on the multi-level government architecture of EU Member States, in addition to the conventional categories of regional and local authorities already described in this section.

For purposes of calculating the self-rule indicator, a metropolitan region is defined as a contiguous, general-purpose jurisdiction that combines one, two, or more cities and their surrounding municipalities to deal with issues stemming from 'conurbanisation' (i.e. the fact that several towns tend to merge with the suburbs of a central city forming an extended urban area). A region is coded as metropolitan if it meets the following criteria: (i) it exists between the local level of government and the national level; (ii) it has a population of at least 150 000; and (iii) the jurisdiction is codified in law.[1] Note that this definition differs from the one used by Eurostat for metro-regions.

The indicator presented in Figure 8.18 is an aggregate measure of the scores obtained by the metropolitan region authorities for the following aspects: institutional depth, policy scope, fiscal autonomy, borrowing autonomy, and representation.

The number of individual metropolitan regions (e.g. the capital city of Wien in Austria) and metropolitan regional categories (e.g. 'Stadtstaaten' in Germany, comprising the cities of Berlin, Bremen, and Hamburg) has increased over time. In 1990, there were only 12 such administrative entities in only five countries (in Austria, Belgium, Germany, France and Hungary), whereas in 2018, the latest year for which data are available, there were 23 in 15 countries, comprising (i) capital city regions in Austria, Belgium, Germany, Croatia, Czechia, France, Portugal, Romania, Slovakia and Slovenia, (ii) large metropolitan areas in Germany, Spain, Italy and Portugal, and (iii) regional categories each with several individual cities in Germany, France, Hungary, Ireland and Poland. Most of the increase in number occurred between 1990 and 2000, when metropolitan regions were introduced in a number of eastern and southern Member States.

Alongside longstanding examples of metropolitan regions established in Austria, Belgium, France and Germany, there are some relatively short-lived ones. For instance, the Greater Copenhagen Authority ('*Hovedstadens Udviklingsråd*') in Denmark (2000-2006), the '*plusregio's*' in the Netherlands (2006-2015), and the union of 11 municipalities that formed the capital city of Warsaw ('*miasta stołecznego Warszawy*') in Poland (1994-2002) were all discontinued, though in some cases (e.g. in Warsaw) the municipalities concerned were merged afterwards. This illustrates the differing strengths of political commitment to this type of entity and how this may change over time. While a number of metropolitan regions have been abolished altogether, in some cases they have been replaced by different entities and forms of cooperation between local authorities, as in the case of the metropolitan area of Barcelona ('*Área Metropolitana de Barcelona*') which replaced the former '*Entitad Municipal Metropolitana de Barcelona*' with increased autonomy.

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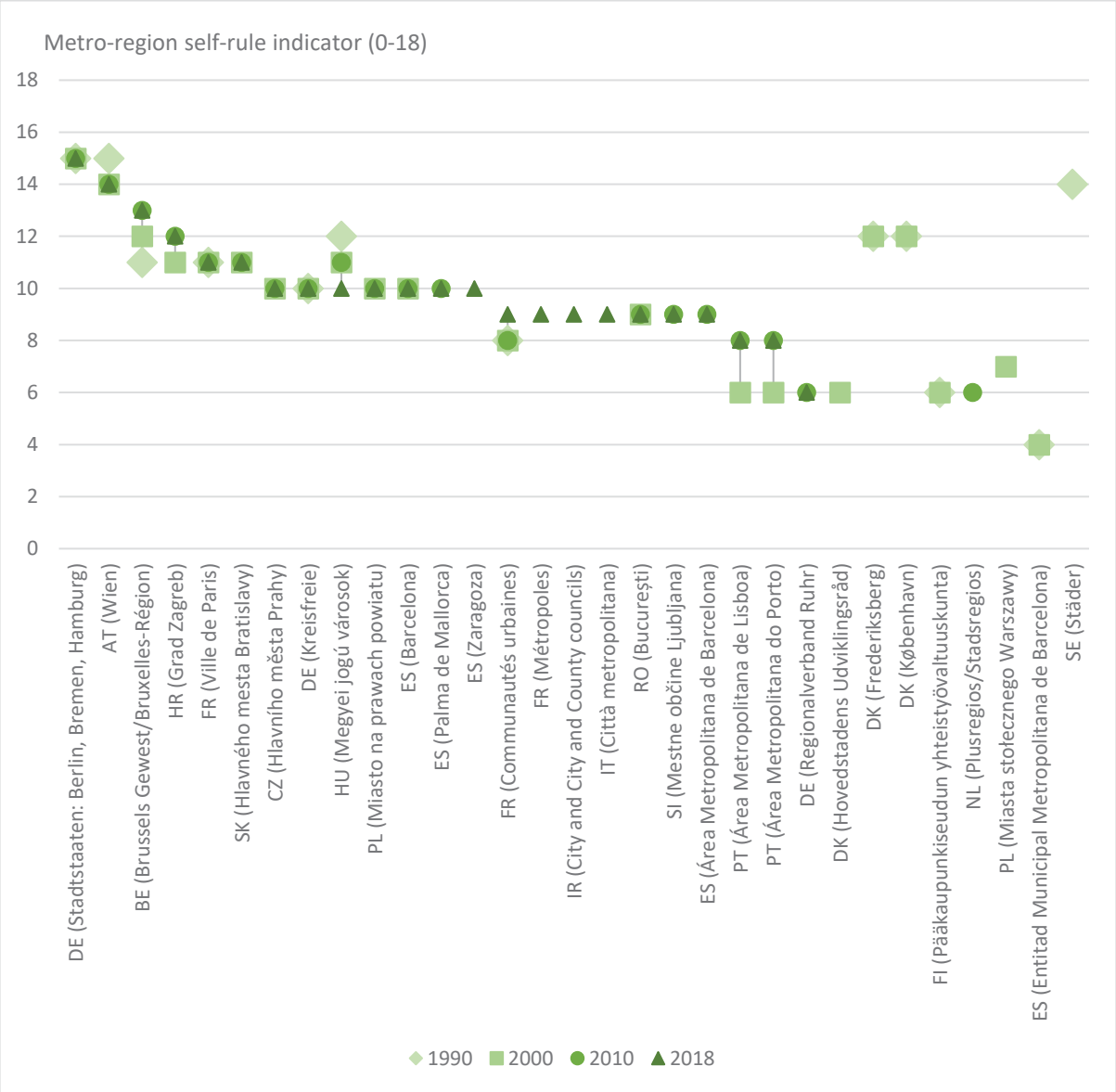
The metropolitan regions established most recently are '*Zaragoza*' in Spain, in 2018, the metropolitan city ('*città metropolitana*') category in Italy in 2015, the 'city' and 'city and county councils' categories in Ireland in 2014, and the '*métropole*' category in France (2010).

Figure 8.18 Metropolitan regions' self-rule indicator, 1990, 2000, 2010, 2018



Source: DG REGIO calculations based on RAI v.3.1 scores for metropolitan regions (https://garymarks.web.unc.edu/data/regional-authority-2/)

In terms of the degree of administrative autonomy, as measured by the self-rule indicator, there is generally not much variation over time for individual entities once they have been established. However, some increase in autonomy seems to have occurred for the Brussels-Capital Region in Belgium, the two Portuguese metropolitan areas, the French '*Communautés urbaines*', and the '*Grad Zagreb*' region in Croatia. The only case of an appreciable decline in autonomy occurring is the urban counties ('*Megyei jogú városok*') in Hungary.

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In 2018, the self-rule indicator showed the highest scores in metropolitan regions located in the federal states of Germany (with the city-states of Berlin, Bremen, and Hamburg scoring 15 out of 18, in line with the score for conventional regions), Austria (with Vienna scoring 14, again as for conventional regions), and Belgium (with Brussels scoring 13, slightly lower than the average for conventional regions). The next highest scores were for capital city regions in Croatia, France and Slovakia (all more than for conventional regions in the respective countries). By contrast, the association of cities and districts in the Ruhr region in Germany scored only 6 out of 18 in terms of autonomy and the two Portuguese metropolitan areas of Lisbon and Porto, only slightly more (8 out of 18), with most other metropolitan regions having scores of 9 or 10.

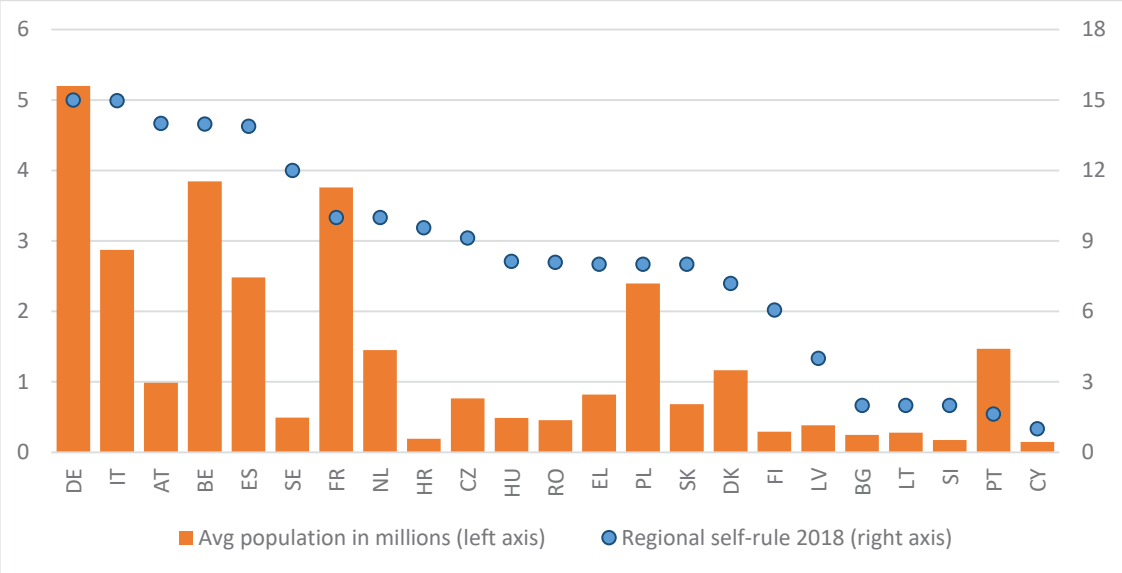
The level of autonomy of metropolitan regions as compared with conventional ones is especially high in Slovenia and Portugal, where they have scores of almost 7 points more than the latter, which have relatively low scores. In some cases, however, metropolitan regions have a lower level of autonomy than conventional ones, as in Italy and Spain, and partly in Germany.

[1] Hooghe, L., G. Marks, A. H. Schakel, S. Niedzwiecki, S. Chapman Osterkatz and S. Shair-Rosenfield (2016) (eds.), *Measuring Regional Authority. A Postfunctionalist Theory of Governance, Volume I*, Oxford: Oxford University Press.

Relating the regional self-rule scores to population size shows that the Member States with larger regions on average tend to have a higher level of regional autonomy (Figure 8.19). Seven of the 8 Member States with a regional self-rule score of more than 10 have regions with average populations of over one million. In contrast, 6 of the 7 Member States with the lowest regional self-rule scores (lower than 6) have regions with an average population of less than 400 000.

North-western and southern Member States tend to have large regions (2.1 million inhabitants on average in the former; 1.6 million in the latter) with a relatively high level of administrative autonomy (with an average score of 11 in the former and 8 in the latter). By contrast, eastern Member States tend to have smaller regions (0.6 million on average) with moderate or low administrative autonomy (with an average score of 6 and all countries with a score below 10).

Figure 8.19 Population size of regional authorities and regional self-rule, 2018-2019

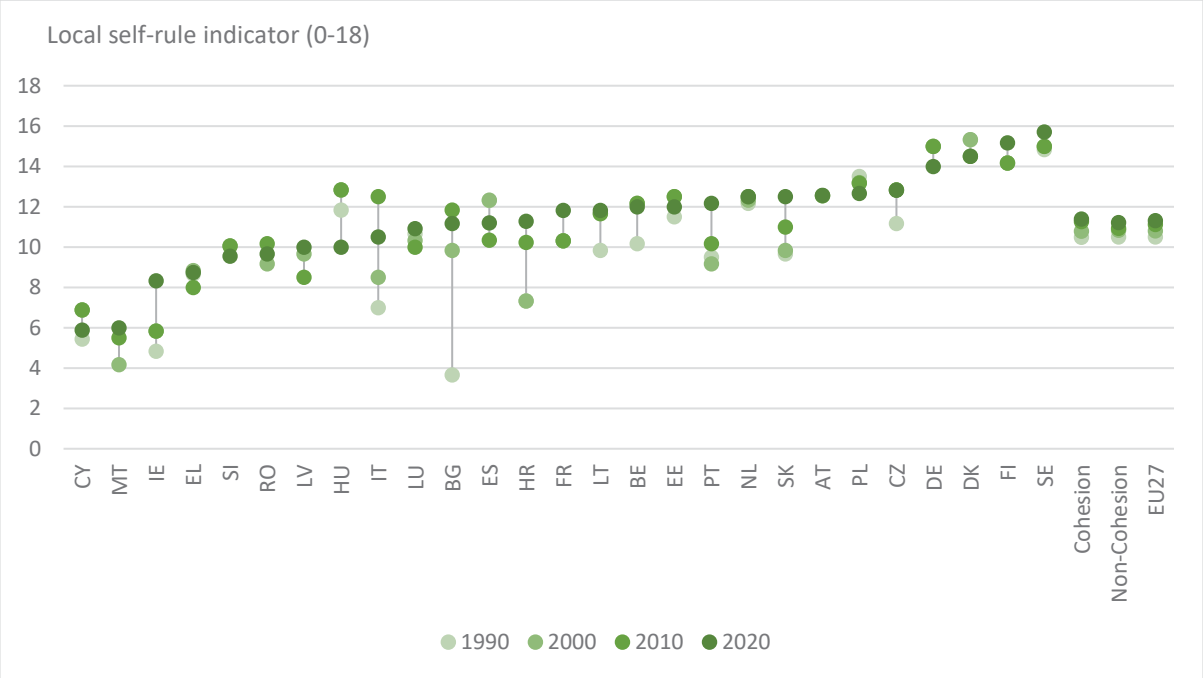


Source: DG REGIO calculations based on RAI v.3.1 scores for the most authoritative regional tier in a country (https://garymarks.web.unc.edu/data/regional-authority-2/)

As regards local self-rule, the indicator shows that the degree of autonomy in the EU at this level on average increased steadily, if moderately, between 1990 and 2020 (Figure 8.20). An increase occurred in the majority of Member States (16 of the 27). It remained broadly unchanged in Cyprus, Greece, Luxembourg, Austria and the Netherlands, while it declined slightly in Denmark, Poland and Slovenia, and more markedly in Hungary, Spain and Germany. In 5 of the 16 countries in which it increased over the period, however, it fell over the last 10 years (2010 to 2020), most especially in Italy, Bulgaria, Romania, Estonia and Belgium.

The Nordic countries are ranked as having the highest level of local autonomy, Sweden, Finland and Denmark having a score higher than 14 out of 18 in 2020, followed by Germany (with 14). At the opposite end of the scale, Cyprus, Malta, Ireland and Greece, all have scores below 9, with Slovenia and Romania having scores only slightly above this. Contrary to the case of regional autonomy, Cohesion countries are assessed as having a marginally higher level of local autonomy than Non-Cohesion ones (with an average score of 11.4 as against 11.2), a difference which has existed since 2000.

Figure 8.20 Local self-rule indicator, 1990, 2000, 2010, and 2020



Source: DG REGIO calculations based on LAI 2.0

The degree of local autonomy does not seem to be related to the size of a country, being relatively high in both large and small Member States. The same is true with respect to the size of local authorities within countries (Figure 8.21). For example, all authorities in Ireland are in the largest size class, but they have, on average, much less autonomy than Danish ones, which are almost

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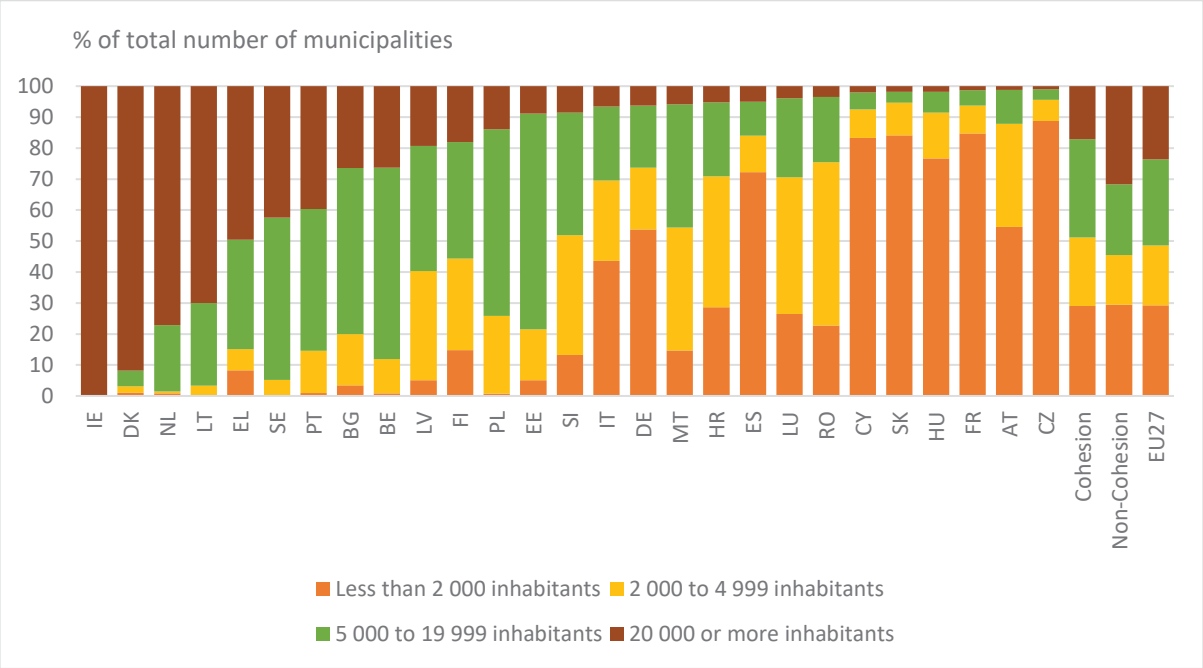
equally as large on average. In general, smaller local authorities tend to have fewer resources than larger ones and less staff, which may mean that the investments the carry out require cooperation with neighbouring authorities and/or more support for capacity building.

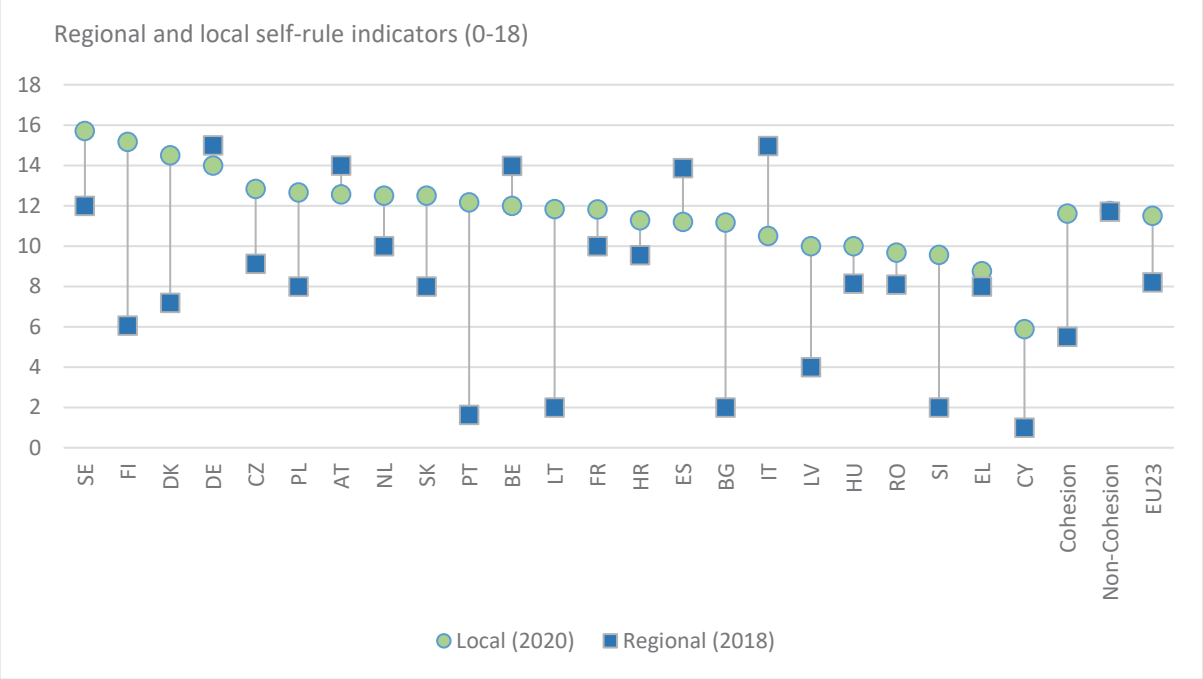
Figure 8.21 Municipalities by population size class, 2018



Note: Data may relate to earlier years for some countries (based on last available census); aggregates are unweighted averages of the country values
Source: OECD (2018), *Key data on Local and Regional Governments in the European Union* (brochure), OECD, Paris; available at: www.oecd.org/regional/regional-policy.

On average, local autonomy tends to be higher than regional autonomy (Figure 8.22). This is the true for both Cohesion and Non-Cohesion countries. Regional autonomy, however, is much lower than at the local level in Cohesion countries, reflecting the relatively weak nature of regional authorities. Local autonomy is assessed as being higher than at regional level in 18 Member States, particularly in Portugal, Bulgaria, Lithuania and Finland, and only slightly less so in Slovenia and Denmark. The 5 countries where regional autonomy is higher than local have either a federal system of government (Germany, Austria and Belgium) or are highly devolved (Spain and Italy).

Figure 8.22 Comparison between regional and local self-rule indicators for latest year



Source: own elaborations based on RAI v.3.1 and LAI 2.0
Note: MT, IE, LU and EE have no regions as defined by the RAI.

8.2 Conclusions

When compared to government capital investment, the importance of cohesion policy for the Member States, especially the less developed ones, has increased markedly during the last programming period. Although not all cohesion policy funding goes to public capital investment, the evidence suggests that in the past decade, cohesion policy has effectively contributed to recovering and sustaining public investment levels in the EU after the reduction occurred in the aftermath of the Great Recession of 2008-2009 and the sovereign debt crisis of 2011.

Case study evidence shows that EU Member States have several nationally-mandated and exclusively nationally-financed policies addressing regional disparities. Nevertheless, cohesion policy is by far the main source of financing for regional development policies. Although territorial in scope, most national policy measures tend to be designed and implemented by central governments, with limited involvement of regional authorities, while cohesion policy requires a partnership with regional and local governments.

Public funding for investment, whether from the EU or national sources, is important for shaping regional development especially when it triggers private investment. Policies to improve productivity and to shift economic activity away from low-value-added sectors, such as investment in human capital, transport infrastructure, and improved governance, appear to be effective in reducing regional disparities.

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Public finances in EU Member States improved steadily from the aftermath of the Great Recession in 2008-2009 up until 2019, but the onset of the COVID-19 pandemic and the economic downturn it induced required extraordinary policy measures, increasing the budget deficit in 2020 in all countries.

At the onset of the COVID-19 crisis, public investment in the EU was still lower than before the financial crisis of 2008-2009, particularly in many Cohesion countries, raising concerns about the consequences of the depressed levels of investment on economic convergence and longer-term development.

Sub-national authorities execute almost a third of the total expenditure of the general government in the EU, with large differences between Member States. This difference, however, has been slowly narrowing over time, suggesting increasing decentralisation of responsibilities, at least for carrying out expenditure.

Sub-national authorities undertake a significant amount of public investment in the EU, around 58% of total public investment in 2019, again with large differences between Member States. Sub-national authorities in Cohesion and Non-Cohesion countries executed similar levels of public investment relative to GDP in the period preceding the COVID-19 crisis, though there are marked differences between Member States, reflecting differences in institutional settings.

Indicators of regional and local autonomy over spending and investment decisions show that this is significantly lower in Cohesion countries than Non-Cohesion ones. Although the difference narrowed between 1990 and 2010, it has tended to widen again over the past decade.

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PART 16/16

COMMISSION STAFF WORKING DOCUMENT

Cohesion in Europe towards 2050

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the 8th Cohesion Report: Cohesion in Europe towards 2050

{COM(2022) 34 final}

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Chapter 9 The impact of cohesion policy

- EU funding for cohesion policy over the 2014-2020 period averaged EUR 112 a year per person in the EU and close to EUR 400 a year in some of the least developed regions.
- From 2014 to 2020, cohesion policy supported over 1.4 million enterprises. Projects selected indicate that this number could rise to over 2 million by the end of the programming period.
- Evaluations show that the support to enterprises produced tangible results. In the Czech Republic, for example, 90% of the companies supported by the "*Knowledge Transfer Partnerships*" programme have introduced product or process innovations.
- By the end of 2020, 11.3 million people had benefited from the flood protection measures co-financed by cohesion policy in the 2014-2020 period. When all selected projects are completed, 24 million people overall should be better protected.
- Thanks to cohesion policy, 1 544 km of railway lines had been laid or upgraded from 2014 to the end of 2020 and a further 3 500 km will be by 2023, once the projects selected are completed.
- Investment in the construction of new roads and the upgrading of others have increased road safety and reduced the number of accidents – the latter by 54% in Poznań and 74% in Lublin in Poland, for example – while reducing journey times and air pollution in cities.
- From 2014 to 2020, programmes helped 45.5 million participants to integrate into the labour market and receive education and training and 5.4 million people had been helped to find a job.
- Over the same period, the healthcare facilities constructed or improved with the support of the ERDF, mainly in the central and eastern Member States, provided an improved service for 53.3 million people.
- Some 15.2 million square metres of open space had been created or rehabilitated from 2014 to 2020 and the completion of the projects selected would bring this up to 53.4 million.
- By the end of 2023, it is estimated that the investment financed by cohesion policy in the 2014-2020 period will have increased GDP in some of the least developed regions in Europe by up to 5%.
- Macroeconomic model simulations show that in the long-run all EU regions benefit from cohesion policy. Every 1 euro spent on cohesion policy in the 2014-2020 period is estimated to generate a return, 15 years after the end of the period, of 2.7 euros in the form of additional EU GDP.

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0. INTRODUCTION

Cohesion policy is the EU's main source of investment in economic and social development across the Union. It is financed by three funds, the European Regional Development Fund (ERDF), the Cohesion Fund and the European Social Fund (ESF). The ERDF, the largest of the three, is allocated to regions (at the NUTS 2 level) on the basis of their GDP per head and other indicators, such as the unemployment rate, less developed regions, defined as those with a level below 75% of the EU average receiving the most, Transition regions, with a level between 75% and 90%[1] of the average, the next largest amount, and more developed regions – the remaining ones – the smallest amount (Map 9.1). In addition, some of the ERDF is also allocated to European trans-border cooperation (Interreg), providing support to border regions, large areas in the EU covering several countries, such as the Danube or Baltic Sea regions, and regions in different Member States adopting a joint approach to tackle common issues.

The Cohesion Fund, allocated at the national level, is restricted to Member States with Gross National Income (GNI) below 90% of the EU average and is limited to financing investment in transport, environmental infrastructure and energy. The ESF, the main source of finance for investment in people, is also allocated at the national level to Member States, taking account of their population, unemployment and levels of education. This was supplemented in 2014-2020 by the Youth Employment Initiative (YEI) to provide support to young people under 25 not in employment, education or training (NEETs) living in regions where youth unemployment was over 25% in 2012.

In 2014-2020, the investment financed by the three Funds was aimed at supporting 11 broad priorities, or Thematic Objectives:

- strengthening RTDI
- enhancing access to, and use and quality of, ICT
- enhancing the competitiveness of SMEs
- supporting the shift towards a low-carbon economy
- promoting climate change adaptation, risk prevention and management
- preserving and protecting the environment and promoting resource efficiency
- promoting sustainable transport and removing bottlenecks in key network infrastructures
- promoting sustainable and quality employment and supporting labour mobility
- promoting social inclusion, combating poverty and discrimination
- investing in education, training and vocational training for skills and lifelong learning
- enhancing institutional capacity of public authorities and efficient public administration

The ERDF was targeted at the first 7 objectives but also financed infrastructure investment in the other four. ,The first four objectives accounted for between 50% and 80% of total ERDF expenditure, depending on the level of regional development (more going on these objectives in the more developed regions). The ESF was concentrated on financing expenditure under the last four objectives, though it also supported (current) spending under the other 7.. The outbreak of Covid-19, however, was followed quickly by two Commission initiatives (CRII and CRII+) to allow governments substantial flexibility to divert unspent cohesion policy funding to finance pandemic-related expenditure, such as on medical equipment and support to jobs and businesses hit by the restrictions put in place to arrest the spread of the virus.

[1] For the 2021-2027 programming period, transition regions are defined as those with a GDP per head between 75% and 100% of the EU average.

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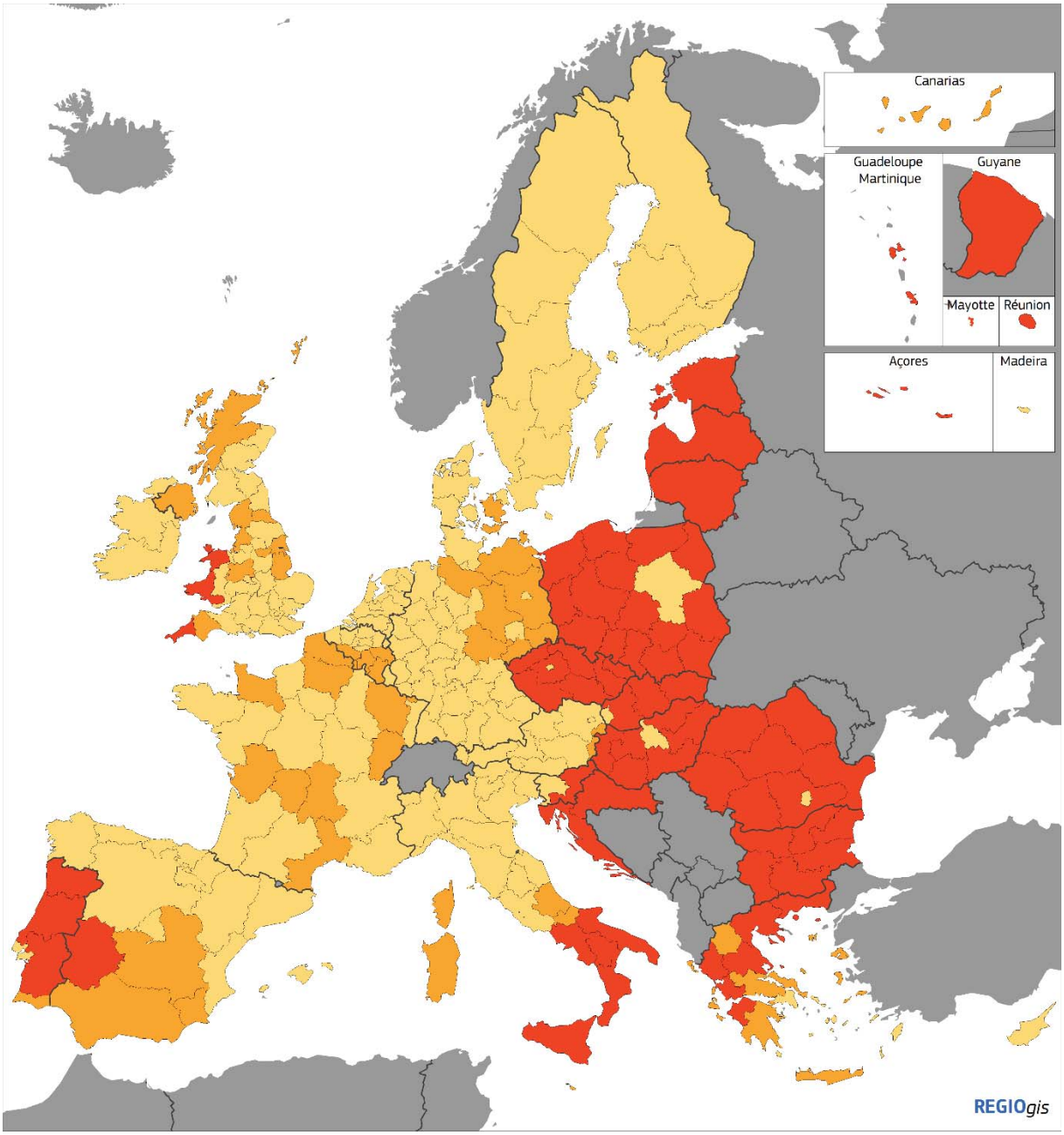
Map 9.**1 Eligibility of regions for cohesion policy funding (ERDF + ESF), 2014-2020**



Structural Funds (ERDF and ESF) eligibility, 2014-2020

Category

- Less developed regions
- Transition regions
- More developed regions

Source: DG REGIO

0 500 Km

© EuroGeographics Association for the administrative boundaries

This chapter is divided into two parts. First, it sets out the monitoring and evaluation evidence on the results of cohesion policy funding for the 2014-2020 period, examining the allocation of funding between broad investment

objectives, the progress made in spending the funding allocated, the output and results so far achieved and the findings from evaluations carried out up to now by Member States. Note that the expenditure financed under the 11 Thematic Objectives listed above is reorganised under the 5 Policy Objectives (POs) for 2021-2027 so as to enable the allocation of funding in the two periods to be directly compared[2].

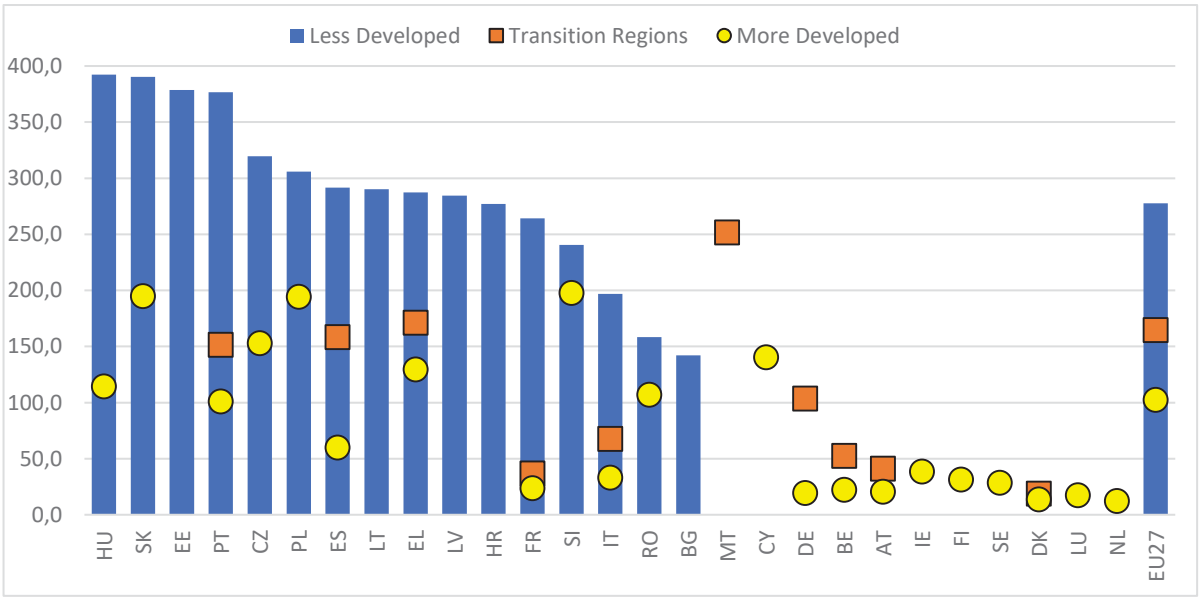
Secondly, it considers the impact of funding over this period on GDP across EU regions using a macroeconomic model to attempt to capture the full and wider effects, indirect as well as direct.

The chapter also includes a number of boxes on other EU initiatives and policies whose remits are close to cohesion policy, notably regional state aid, Horizon 2020, the Just Transition Fund, the Common Agricultural Policy and the Connecting Europe Facility.

1. Part 1 Monitoring and Evaluation Evidence

Some EUR 355 billion was allocated by the EU to cohesion policy for the 2014-2020 period, with national financing increasing this to EUR 482 billion. Overall, EU funding for cohesion policy over this period amounted to an average each year of EUR 112 for each person in the 27 Member States. The average, however, varied markedly between regions across the EU as well as between countries. It was largest per head of population in less developed regions in Hungary and Slovakia, at around EUR 390 and was just under EUR 380 in both Estonia and less developed regions in Portugal (Figure 9.1). On the other hand, it was under EUR 200 in Italy and around EUR 150 in Romania and Bulgaria.

Figure 9.1 Cohesion policy funding per head of population by type of region, 2014-2020 (annual averages, EUR at current prices)



Note: Cohesion policy funding includes the ERDF, Cohesion Fund, ESF and YEI. The Cohesion Fund is assumed to be allocated evenly across countries in relation to population. The same is the case for the YEI and European Transnational Cooperation funding under the ERDF. Funding for interregional cooperation under the latter is excluded from the Figure. This was very small, amounting to much less than EUR 1 per person on average. Countries are ordered in terms of the funding going to less developed regions relative to their population and then by the funding going to transition and more developed regions per head of population, according to which is the largest.

[2] The annual summary report 2021 – COM(2021) XXX of xx.12.2021 – adopted under Article 53 of the Common Provisions Regulation reports on implementation using the original eleven thematic objectives set for the ESI Funds in 2014-2020.

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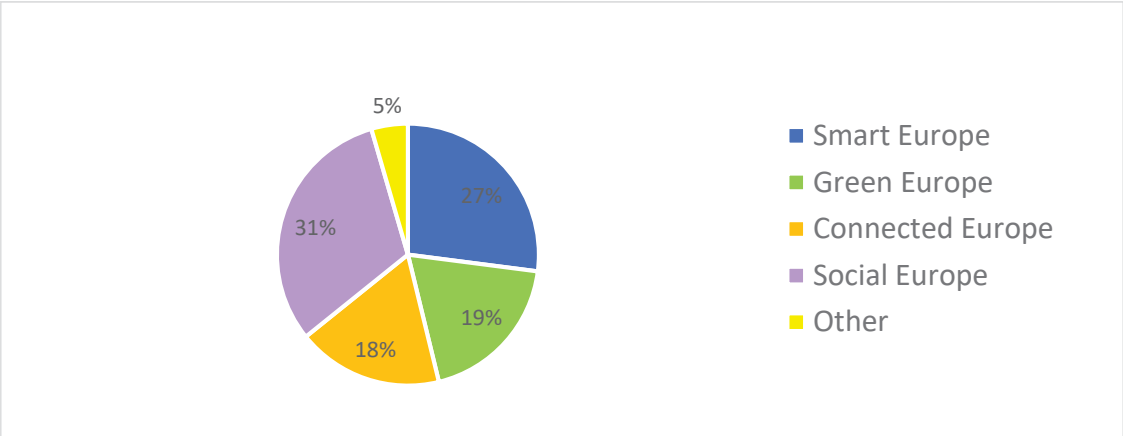
Funding going to the Outermost regions, which is relevant for Spain, France and Portugal, is excluded, as is the funding going to the Northern sparsely-populated regions, which is relevant for Finland and Sweden. In each case, this amounted to EUR 33.6 per person living in these regions.

Source: DG REGIO calculations.

Funding per person in transition regions was around half or less of the average in less developed regions in most countries, while also varying between countries according to their level of GDP per head. Funding going to more developed regions was smaller again, though relatively large in relation to population in the regions concerned in Slovakia, Poland and Slovenia. In each case, this is partly because of the amounts received from the Cohesion Fund, which are assumed to be the same per person in these regions as in less developed ones. As in the case of the funding going to the transition regions, the amount varies markedly between countries, reflecting their relative levels of prosperity.

In terms of the kinds of investment financed, almost a third of EU funding went to pursuit of the Social Europe objective in support of inclusion measures and just over a quarter to Smart Europe in support of investment in R&D, innovation and competitiveness, while just under 20% went to both 'Green Europe' and 'Connected Europe' (Figure 9.2).

Figure 9.2 EU cohesion policy budget (2014-2020) by major Objective



2014-2020 EU allocations mapped to 2021-2027 policy objectives		EU funding planned EUR million 31/12/2020	% of total cohesion budget	EU funding spent EUR million 31/12/2020	% of EU funding 31/12/2020
PO1	Smarter Europe	95,903.2	27.0%	51,549.5	54%
PO2	Greener Europe	68,662.0	19.4%	29,158.0	42%
PO3	Connected Europe	64,106.8	18.1%	36,871.1	58%
PO4	Social Europe	111,115.8	31.3%	59,598.1	54%
	Other (i.e. technical assistance)	14,992.3	4.0%	7,228.5	48%
	Cohesion policy total		**100.0%**		**52%**
	Of which: *PO5 Europe Closer to citizens*	*31,000.0*		*12,000.0*	*39%*

Note: The funding allocated to the 11 Thematic Objectives for 2014-2020 is approximately mapped to the 5 Policy Objectives for 2021-2027. The 'Europe closer to the citizens' objective covers a number of integrated territorial measures included under various Thematic Objectives and the funding involved can only be roughly estimated.

Source: Cohesion Open Data – https://cohesiondata.ec.europa.eu/d/aesb-873i

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The monitoring of cohesion policy expenditure was strengthened significantly in the 2014-2020 period compared to the previous one (2007-2013). More detailed, and more structured, financial data are available three times a year, together with a more complete set of common output indicators for the support provided by the ERDF, ESF and Cohesion Fund and common result indicators for ESF support showing the direct achievements of expenditure. Transparency and accountability have also been improved by the regular publication of monitoring data on the ESI Funds Open Data Platform[3].

When interpreting the financial data and common indicators, it is important to bear in mind that

- Expenditure financed by 2014-2020 funding can continue up to the end of 2023, so that in many cases, projects or measures were still ongoing at the end of 2020, which the indicator values relate to, implying that the outcomes that are so far evident give a very incomplete picture of the full achievements of the programmes concerned.
- Much of the ERDF and Cohesion Fund expenditure is on infrastructure projects and on measures, such as support for RTDI, which take time to produce their full effects. The output and monitoring indicators, as well as the evaluations carried out so far, therefore, tend to understate the effects of the expenditure undertaken up to now, in many cases considerably.
- The focus here is on the long term strategic priorities set before the COVID-19 response was implemented in 2020 and 2021 under the Coronavirus Response Investment initiatives (CRII and CRII+). The main reason for this is that full information on the reprogramming involved is not yet available [4].
- The overview here does not cover the additional EUR 50 billion for Next Generation EU/REACT which the EU made available during 2021. Implementation of the investment funded by this is still at an early stage[5].

(The Commission presents annual reports to the EU institutions on the implementation of the 2014-2020 cohesion policy programmes under Article 53 of the Common Provisions Regulation. The 2021 report adopted in December 2021 and previous reports are available online[6].)

Box 9.1 Cohesion policy confronting the Covid crisis: a fast, flexible and effective response

When facing the socio-economic crisis caused by the Covid pandemic, cohesion policy has been the in the forefront of the EU response, responding, in particular, to the two main immediate effects of this unprecedented shock: the major strain on the healthcare sector and the substantial liquidity risk to business, notably small businesses, forced to cease their activities, with millions of jobs at stake, together with an irreversible loss of skills and capacity.

In record time, the European institutions adopted two new regulations– the two Coronavirus Response Investment Initiatives, enlarging the eligibility of cohesion policy funds and increasing the flexibility offered to programming authorities. Over EUR 20 billion was reallocated by the end of 2020 to secure vital personal protective equipment, ventilators and ambulances. Businesses were able to benefit from emergency grants and low-interest rate loans, which allowed them to stay afloat during lockdowns. New employment measures, in particular short-time work arrangements, were put in place to make sure people did not find themselves without income from one day to another. In parallel, simplification measures have been promoted, easing audit procedures and relaxing reporting deadlines, enabling Member States to cope with the workload by first addressing the urgent needs of the community, while reporting on the achievements at a later stage.

[3] Explore the 2014-2020 programmes using open data here: https://cohesiondata.ec.europa.eu/

[4] The COVID-19 reprogramming decided to date is presented in detail on the Cohesion Policy Coronavirus dashboard (https://cohesiondata.ec.europa.eu/stories/s/CORONAVIRUS-DASHBOARD-COHESION-POLICY-RESPONSE/4e2z-pw8r). The separate ESI Funds Annual summary report 2021 makes a first assessment of the initial implementation of the CRII/CRII+ measures.

[5] The REACT-EU allocations decided can be tracked in detail on the REACT-EU dashboard (https://cohesiondata.ec.europa.eu/stories/s/REACT-EU-Fostering-crisis-repair-and-resilience/26d9-dqzy).

[6] https://ec.europa.eu/regional_policy/en/policy/how/stages-step-by-step/strategic-report/

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To assist with dealing with the pressure on public budgets, Member States were allowed exceptionally to keep EUR 7.6 billion in unspent cohesion policy funds in their national budgets and use it immediately for the worst affected sectors. 100% EU co-financing for a larger share of projects has been introduced and, again exceptionally, it became possible to finance completed projects that directly helped to tackle the crisis. 188 cohesion policy programmes made use of this possibility, accelerating the absorption of funds by disbursing an additional €12.6 billion.

The recovery process has been further consolidated through the introduction of the REACT-EU initiative, which has been the first to mobilise resources under Next Generation EU. Thanks to its high rate of pre-financing, Member States have already been able to start working on new projects to help medical institutions, business owners, employees and vulnerable people. This injection of EU funds will allow the resumption of projects previously halted in favour of emergency needs. Moreover, special attention has been given to green and digital priorities, which are essential for a smart, sustainable and resilient recovery, consistent with the EU's broader political agenda.

REACT-EU resources are designed to target the geographic areas and cities most affected by the impact of the Covid pandemic, without being required to be broken down by category of region, so hence increasing the speed and effectiveness of the recovery process.

Lessons from the crisis have also been drawn in the delivery mechanisms of cohesion policy for 2021-2027. In particular, the Commission has been empowered to take implementing decisions for limited periods of time, if unexpected adverse economic events occur. The adaptability of the policy has also been reinforced, including through the mid-term review, enabling Member States to accommodate new challenges and unexpected events. Lastly, the effectiveness of smart specialisation strategies has been strengthened, allowing Member States and regions to further diversify their economies and so reduce their vulnerability to shocks.
Overall, cohesion policy has proved to be agile and effective in adapting rapidly to the crisis, providing Member States, regions and cities with a comprehensive and tailored toolkit to address the uneven territorial social and economic effects of the pandemic..

While the financial data and common output and result indicators used to monitor expenditure cover the whole EU, the evaluation evidence on the 2014-2020 period comes so far from the evaluations commissioned by national and regional Managing Authorities in Member States. This evidence, therefore, relates to the measures or projects carried out in individual countries or regions, or, in the case of Interreg programmes, in two or more Member States.

Accordingly, the evidence is inevitably specific to the countries or regions concerned and cannot necessarily be assumed to apply elsewhere. Nevertheless, in many cases, much the same findings on the effects of the measures supported emerge from evaluations carried out in different contexts, so it is reasonable to consider them applicable more generally[7].

Expenditure under each of the Policy Objectives is considered in turn below, in each case, examining:

i) the extent to which the funding available for the 2014-2020 period has been spent up to now, what it has been spent on and the immediate results according to the common indicators for which data are reported annually for national and regional programmes;

ii) typical evidence from the evaluations so far carried out in Member States on the effects of the expenditure concerned on policy objectives.

1.1 PO1 SMARTER EUROPE

1.1.1.Progress in investment and monitoring of key outputs

In 2014-2020, EUR 96 billion of the ERDF for the period, or 27% of total cohesion policy funding, was devoted to 'Smarter Europe' objectives, for support to research, technological development and innovation (RTDI), ICT and SME competitiveness. Up to the end of 2020, the funding for the projects selected for support amounted to around 114%

[7] It should be noted that a full EU wide ex post evaluation of the 2014-2020 programmes will be carried out by the Commission by the end of 2024.

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of the total EU allocation – i.e. more than the sum available (reflecting a policy of allowing for the likelihood that at least some projects will not actually go ahead) - while an estimated EUR 52 billion of funding, 54% of the total available, had been spent.

The common indicators give an indication of the immediate outputs from this expenditure as well as how these relate to the targets set. The indicators under the Smarter Europe objective show that over 610 000 enterprises received support up to the end of 2019 and that another 480,000 or so will receive support if the projects selected are completed (Table 9.1). They also show that 17 500 enterprises receiving support had introduced new products and another 18 000 will do so by the end of 2023 if all projects selected are undertaken. They show, in addition, that the targets set are likely to be reached, or exceeded, by the end of 2023 in all cases, except for population with access to broadband. In this case, support is concentrated in Spain, Italy and Poland, where progress in implementation has been relatively slow in aggregate and so the population given broadband access amounted to only 46% of the 2023 target by the end of 2020. However, the target will almost be reached if the projects selected for funding are completed.

Table 9.1 'Smarter Europe' indicators: 2023 targets and achievements up to end-2020

	2023 target	Projects selected	Implemented, number and % of target
The number of enterprises cooperating with research institutes	62 000	78 000	44 800 *72%*
The number of enterprises introducing new products to the market	30 250	40 600	23 900 *79%*
The number of researchers benefiting from RTD infrastructure	85 400	112 000	44 800 *52%*
The number of enterprises receiving support	1 780 000	2 011 000	1 442 333 *81%*
The number of jobs created in the enterprises supported	361 900	451 700	238 300 *66%*
New enterprises supported	178 000	195 000	124 900 *70%*
Population with access to broadband	11 900 000	11 550 000	5 518 000 *46%*

Source: Cohesion Open Data https://cohesiondata.ec.europa.eu/d/aesb-873i

1.1.2.Examples of thematic evaluation findings in Member States

1.1.2.1.Support for knowledge transfer, business innovation and cooperation between enterprises and research centres

Much of the support for research and innovation has been directed to increasing collaboration between companies, particularly SMEs, and universities and other research centres. This has been achieved through both the creation of new links and the expansion of existing ones. Successful examples of support leading to increased collaboration of this kind are evident across the EU, such as in the Czechia where the measures financed greatly exceeded the targets for firms supported and cases of collaboration between companies and research centres. Some 70% of companies have launched further joint research initiatives after support came to an end, demonstrating the long-term sustainability of the links established.

Such sustainability is also evident in respect of the Germany-Netherlands Interreg OP where support has led to the creation and development of cross-border technology transfer networks, as well as in Austria, where measures supporting investment in technology and R&D in SMEs have resulted in increased knowledge transfer and strengthened the innovation environment. In addition, in Nordrhein-Westfalen, in Germany, support provided has led

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to a deepening of existing collaboration between enterprises and research centres and to the creation of new networks, which, as a consequence, has helped to increase the capacity of firms to enter new markets.

Direct support for R&D and innovation has boosted the capacity of enterprises to develop new products and processes across the EU. In Dolnośląskie in Poland, for example, the measures financed have increased R&D activities in SMEs, as well as strengthening employee competences and, in Śląskie, increasing the scale of operations, employment and profitability. In Germany, measures funded by the Sachsen OP led to new products and services being introduced by SMEs and existing products being improved, which, in turn, increased turnover and employment. In the Czech Republic, 90% of the companies supported by the "*Knowledge Transfer Partnerships*" programme have introduced product or process innovations. In the Czech Republic too, the financing provided to increase the availability of infrastructure for enterprises (the Real Estate programme) has enabled recipients to expand production, to innovate and to enlarge the number of products.

In many cases, support for RTDI has focused on furthering the pursuit of Smart Specialisation Strategies and on helping to develop a more innovative and competitive economy. This is the case, for example, in Wielkopolskie in Poland, where such support has helped to eliminate barriers to innovation, especially by increasing investment outlays and reducing the costs involved, while in Portugal, Valencia in Spain and Puglia in Italy, the companies supported have increased exports and .their participation in international markets.

Evidence from evaluations carried out on the 2007-2013 programmes, which have had longer to produce their effects, confirm these positive findings. in Latvia, for example, support for research institutes helped to improve cooperation with industry and to increase the active participation of researchers in international projects. A similar increase occurred in Poland as a result of the support provided under the Innovative Economy OP.

1.1.2.2.SME competitiveness

The support from the ERDF for R&D and innovation has the ultimate objective of increasing competitiveness and so the growth potential of regions and firms. Indeed, in the case of SMEs, the funding concerned often has the dual aim of increasing their capacity to innovate and of strengthening their competitiveness, especially in international markets. .This applies to the support going to companies in Portugal, Valencia and Puglia, mentioned above, where the investment financed has achieved both aims.

In Portugal, the support which was provided under the 2007-2013 programme led to growth in both national and international markets, while in Puglia, the measures financed in this earlier period resulted in a significant growth of exports.

In Poland, the more general support to SMEs for investment provided by the 16 regional OPs has led to an increase in productivity and exports, but has also helped to increase output and employment. Similarly, in Piemonte in Italy, support for the development of innovation poles over the 2010-2015 period led to increased value-added, productivity and employment, especially in manufacturing. In Thüringen, in Germany, the start-up fund and the growth fund created for SMEs in their first years have enabled firms to access additional capital and have led to an increase in their competitiveness and improved their access to new markets. In addition, the *Thuringia Invest* programme, designed to strengthen the competitiveness of SMEs, has accelerated their investment and/or led to larger projects being undertaken in 75% of cases

In Estonia too, there is evidence of the beneficial effects of the 2007-2013 programme in the form of the creation of a large number of start-ups in knowledge-intensive service sectors and an increase in the number employed, the return on sales and value-added per employee in the companies supported.

1.1.2.3 ICT development

Cohesion policy funding for digitalisation has led to the development of ICT products and services, including e-government ones by public authorities. For example, in Mazowieckie, in Poland, the implementation of the e-services supported has been followed by 68% of residents and 72% of businesses in the region making use of them. This, in turn, has increased the transparency of public sector activities and people's awareness of them as well as helping to reduce the extent of digital exclusion among older people. This continued the support provided to ICT in the earlier

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period, when in Podkarpackie, financing from the ERDF helped to construct 59 km of broadband network, and 206 km of local-area networks and to modernise a further 240 km, mainly in rural areas.

Other examples of the effects of funding for ICT in the 2007-2013 period are, in Latvia, an improvement in the overall efficiency of the public administration through digitalisation and a reduction in the administrative burden on individuals and businesses and, in Prague, the expansion of public broadband and e-government services which has similarly led to the city's administration becoming more efficient.

Box 9.2 State aid in support of regional development

Aim and scope of regional State aid

The Treaty on the Functioning of the European Union (Article 107(3)a and 107(3)c) provides for specific cases where State aid is considered compatible with competition in the internal market. Specifically, State aid must be exclusively aimed at promoting the economic development of outermost regions and areas where the standard of living is abnormally low or where there is serious underemployment or at facilitating the development of particular economic areas in the EU where aid does not significantly affect competition. These types of State aid are known as regional aid, regional aid schemes needing to form an integral part of a regional development strategy with clearly defined objectives.

For aid to be compatible with competition in the internal market, its adverse effects in terms of distorting competition and affecting trade between Member States must be limited and must not outweigh the positive effects to an extent that would be contrary to the common interest. The primary objective of State aid control in respect of regional aid is to ensure that aid for regional development and territorial cohesion does not adversely affect trading conditions between Member States to an undue extent.

As a general principle, Member States must notify regional aid to the European Commission, with the exception of measures that fulfil the conditions laid down in the General Block Exemption Regulation (GBER) for regional investment aid. The European Commission then assesses the aid notified according to the principles set out in the Guidelines on regional State aid[8]. These were issued as part of an ongoing review of competition rules to ensure they are fit for an evolving market environment.

Types of area for regional aid

In accordance with the prescriptions of the Treaty on the Functioning of the European Union, the Annexes to the Guidelines identify two types of area that qualify as a target for regional aid in the period 2021-2027 (Map 9.2):

- The 'a' areas which include the outermost regions, and NUTS2 regions where GDP per head in PPS is 75% of the EU27 average or less (based on the average of Eurostat regional data for 2016-2018).
- The predefined 'c' areas which include NUTS 2 regions formerly designated as 'a' areas in 2017-2020 and sparsely populated areas, i.e. NUTS 2 regions with fewer than 8 inhabitants per square km or NUTS 3 regions with fewer than 12.5 inhabitants per square km (based on Eurostat data on population density for 2018).

There is another category of 'c' areas, which is regions that a Member State may at its own discretion designate as being in nerd of support, though it has to demonstrate that they fulfil certain socioeconomic criteria (these are known as non-predefined 'c' areas). In this respect, the Guidelines state that the criteria used by Member States for designating 'c' areas should reflect the range of situations in which granting regional aid may be justified. The criteria should, therefore, relate to the socioeconomic, geographical or structural problems likely to be encountered in 'c' areas and should provide sufficient safeguards that granting regional State aid will not affect trading conditions to an extent contrary to the common interest.

[8] European Commission, C(2021) 2594 final.

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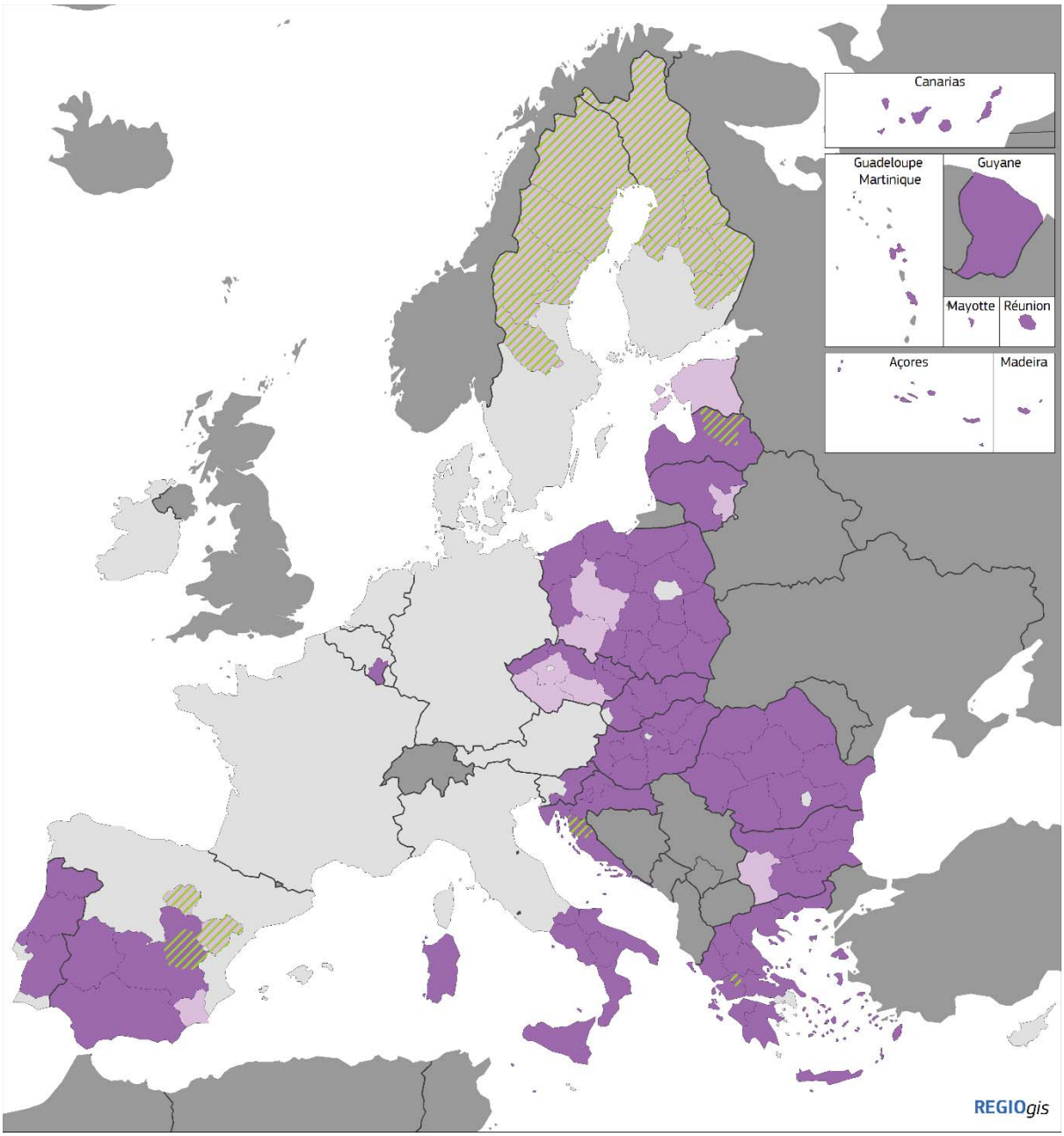
The overall maximum coverage of 'a' and 'c' areas is set at 48% of the EU-27 population in 2018.

For the period 2022-2027, eligible 'a' areas are mostly concentrated in eastern European countries and regions in southern Europe; predefined 'c' areas are mostly in the northernmost part of Sweden and Finland and central Spain where they coincide with sparsely-populated regions and in some eastern European countries.

In response to the economic disturbance created by the COVID-19 pandemic, the European Commission has put in place targeted instruments, such as the Temporary Framework for State aid measures. The pandemic may have more long-lasting effects in certain areas than in others., though at this point in time, it is too early to predict the its long-term impact and to identify which areas will be particularly affected. The Commission, therefore, plans a mid-term review of the regional aid maps in 2023, which will take into account the latest available statistics.

Map 9.2 Regional State aid areas, 2022-2027



Regional State aid areas, 2022-2027

Categories of areas

"a" areas

predefined "c" areas

sparsely populated areas

Source: Commission Communication on guidelines on regional State aid, 19/04/2021

0 500 Km

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Box 9.3 The HORIZON 2020 EU R&D Framework Programme

Horizon Europe is the EU's main funding programme for research and innovation with a budget of EUR 95.5 billion for the period 2021-2027. It is the successor to Horizon 2020 (2014-2020) which had a budget of nearly EUR 80 billion. The objective of both programmes is to support research excellence wherever it takes place via EU-wide calls for research proposals. The programmes do not use pre-determined national envelopes or otherwise differentiate their allocation of funding by regional, group or territory. Funding is far from being evenly distributed across EU Member States and regions (Map 9.3) and is generally in line with their expenditure on R&D. However, the 'Widening Participation and Spreading Excellence' activities under Horizon Europe,, with funding nearly three times greater than the equivalent support under Horizon 2020, should help to build research and innovation capacity in the countries lagging behind.

The main recipient regions from Horizon 2020 tended to be those in the north-west of Europe where capital cities (Paris, Brussels) or major universities are located, whereas regions in the east of the EU received much lower levels of funding. Germany and France, on average, received less funding per inhabitant than other countries in the north-west, but some of the regions in these countries are among the largest recipients.

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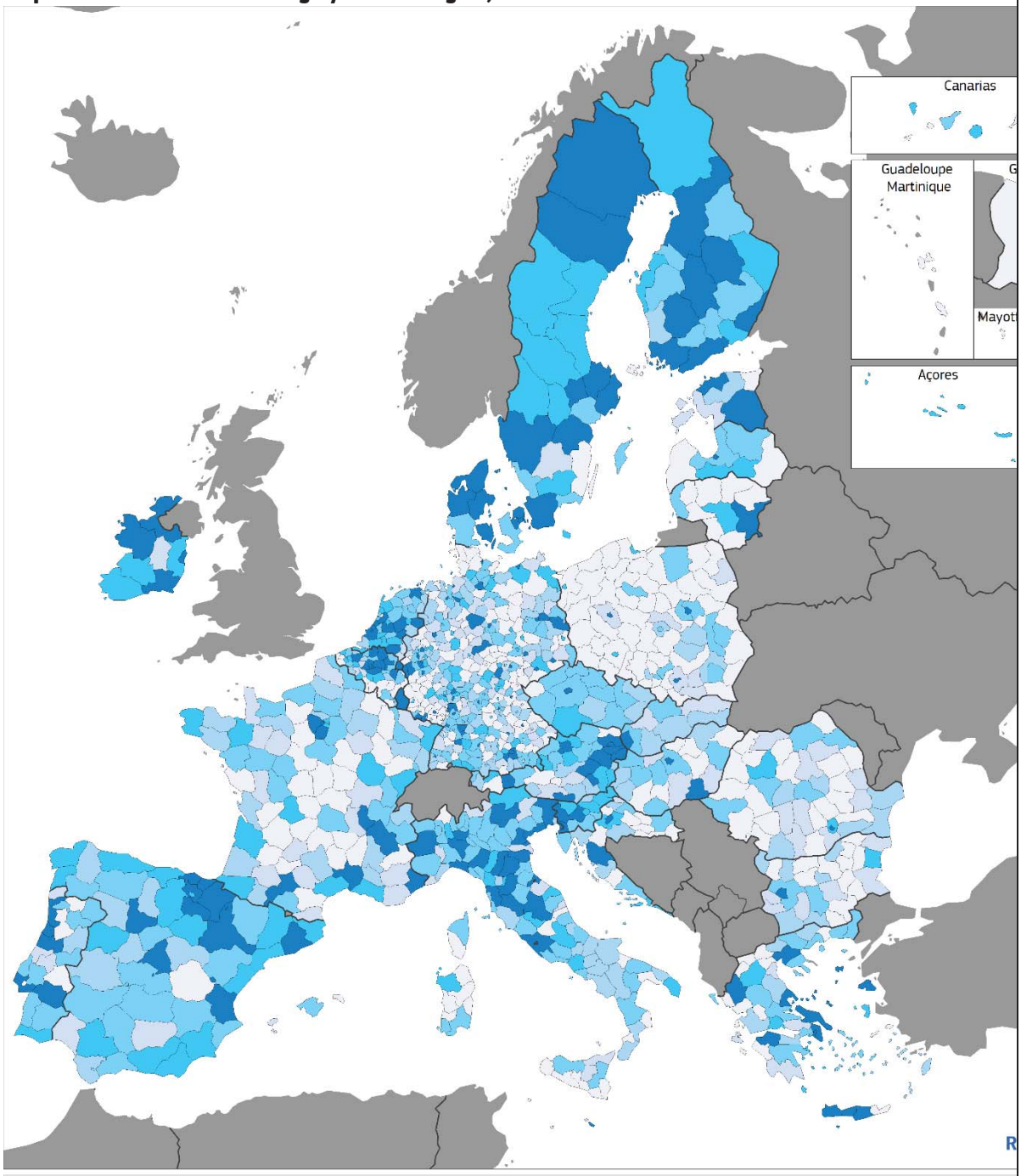
Map 9.3: Horizon 2020 funding by NUTS 3 region, 2014-2020



Horizon 2020 funding by NUTS3 region, 2014-2020

Euro per inhabitant

- 0.0 - 5.0
- 5.1 - 10.0
- 10.1 - 20.0
- 20.1 - 50.0
- 50.1 - 100.0
- > 100.0

EU-27 = 111.29
EU funding for projects approved between
14/05/2014 and 02/04/2021 (data extracted the 07/05/2021)
Source: European Commission

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1.2. PO2 GREENER EUROPE

1.2.1. Progress in investment and monitoring of key outputs

Total EU funding of EUR 68 billion from the ERDF and Cohesion Fund was devoted to "Greener Europe" objectives in 2014-20020, targeting increases in energy efficiency and renewable energy, improvements in environmental infrastructure, the development of the circular economy, mitigation of, and adaptation to, climate change, risk prevention, biodiversity and clean urban transport. The funding represents 19% of the total available under cohesion policy for the period.

At the end of 2020, funding for projects selected under these objectives exceeded the EU financing available by around 112 %, while an estimated €29 billion (42% of the total EU amount allocated) had been spent on investment projects.

Investment in sustainable energy was supported in the period in nearly all Member States, while that on environmental infrastructure (to improve water supply, wastewater treatment and waste management) and on risk prevention is concentrated mainly in developing Member States in eastern Europe and less developed and transition regions in the southern EU. Investment in clean urban transport (on metro lines and tramways) is supported in only a small number of countries. The common indicators reported relate to the same groups of countries and regions.

The indicators show, for example, that 11.3 million people had benefited from the flood protection measures supported by the end of 2020, 41% of the target for 2023, and that overall 42 million would benefit if the projects selected were all completed (implying that the projects still to be completed cover, on average, a much larger number of people than those already undertaken) (Table 9.2).

Table 9.2 'Greener Europe' indicators: 2023 targets and achievements up to end-2020

	2023 target	**Selected projects**	**Implemented, number and % of target**
Number of households with improved energy consumption classification	600 000	663 000	359 400 *60%*
Decrease of annual primary energy consumption of public buildings (gigawatt /hours)	6 480	7 069	1 892 *29%*
Renewables: Additional capacity of renewable energy production (megawatts)	6 618	7 404	2 734 *41%*
Estimated annual decrease of greenhouse gasses (million tonnes CO_2 equivalent)	20.8	23.4	4.4 *21%*
Total length of new or improved tram and metro lines (km)	478	542	137 *29%*
Population benefiting from flood protection measures	27 700 000	42 000 000	11 300 000 *41%*
Additional population served by improved water supply	14 900 000	19 500 000	3 500 000 *24%*
Additional population served by improved wastewater treatment	600 000	663 000	359 400 *60%*

Source: Cohesion Open Data https://cohesiondata.ec.europa.eu/d/aesb-873i

The indicators also show that, for many of them, outcomes at the end of 2020 were very much lower than the targets set (only 21% of the target in the case of the reduction in GHG emissions). This, in part, reflects the relatively slow implementation of projects, as implied by the relatively low rate of expenditure, but it also reflects the fact that the projects concerned predominantly consist of investment in infrastructure that takes several years to plan and several further years to carry out. It is only when the construction is completed and the infrastructure is operational that outcomes are reflected in the indicators.

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Two other factors might also play a role. The issue of the capacity of the environmental bodies concerned to secure funds, manage and implement multi-annual investments has been raised in evaluations for previous periods. More technically, some of the green indicators are being widely used for the first time in 2014-2020, which might mean there are delays in reporting on them (learning effects). The experience at the end of 2007-2013 was that significant achievements were reported for comparable indicators in the last two years of expenditure on projects (2014 and 2015). Indeed, the figures for projects selected suggest that if these are completed, then the targets set for 2023 will be met for four of the environmental indicators. However, for the indicator on reductions in GHG emissions, the two on energy efficiency and the one on renewables, there is a risk that outcomes will fall short of targets, though substantial achievements are still likely to be made.

Box 9.4 Just Transition Fund

The Just Transition Fund (JTF), as part of the Just Transition Mechanism (JTM) is one of the EU's key instruments set up to respond to the effects of the transition towards climate neutrality by 2050. Reaching this objective will require a transformation of both society and the economy Some Member States and regions , however, are likely to be more affected than others and the JTM is crucial to avoiding regional disparities increasing further and to ensure that no one is left behind. It is composed by three pillars: 1) the Just Transition Fund, 2) a dedicated Just Transition Scheme under InvestEU designed to pull in private investment and 3) a Public Sector Loan Facility to leverage additional public investment in cooperation with the European Investment Bank.

The JTF is implemented under shared management and is incorporated in cohesion policy. Though it does not contribute *per se* to the transition towards climate neutrality. Its objective is to alleviate the socio-economic costs resulting from tis. While all Member States could benefit from the JTF, support is focused on regions that are most likely to be affected by the transition, notably those that still rely heavily on mining and extraction activities (especially coal, lignite, peat and oil shale) and GHG-intensive industries. Some of these activities will need to be phased out or transformed to be more sustainable, and the JTF will be crucial in helping to diversify the local economies and alleviate the adverse effect on employment.

The fund is endowed with EUR 17.5 billion (at 2018 prices), of which: EUR 7.5 billion will be financed from the EU budget for 2021-2027 and EU 10 billion from the European Recovery Instrument within Next Generation EU, the latter being made available from 2021 to 2023.

In addition, Member States may, on a voluntary basis, transfer resources from their national allocations under the ERDF and the ESF plus to the JTF, provided that the total amount transferred does not exceed three times the JTF allocation. Spending from the EU budget will be supplemented by national co-financing according to cohesion policy rules. Overall, therefore, the Fund is expected to mobilise around € 55 billion of financing for investment.

The JTF will support productive investment in SMEs and the creation of new firms. It may also support investment in areas such as RTDI, environmental rehabilitation, clean energy, upskilling of workers, job-search assistance and the active inclusion of jobseekers, as well as the transformation of existing carbon-intensive installations, when these investments lead to substantial cuts in emissions and job protection.

The governance of the JTF and, more generally, the JTM is built on the Territorial Just Transition Plans (TJTPs) that Member States need to prepare in cooperation with relevant stakeholders and the European Commission. The plans are intended to identify eligible areas, corresponding to NUTS 3 regions or parts of them, which are affected most by the transition. The plans detail, for each area, an assessment of the needs and the socioeconomic challenges, linked to the conversion or closure of activities involving high GHG intensity, and the adaptation to the resulting changes in the labour market.

The preparation of the TJTPs is being guided by the analysis carried out by European Commission in the 2020 country reports, assessing the situation in the areas expected to be the most affected. The Commission is also channelling support to Member States for the preparation of the TJTPs, and a Just Transition Platform has been created to provide technical assistance and advice to help ensure that the best use is made of the JTM. In addition, each pillar of the JTM provides assistance for preparing operations that are eligible.

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1.2.2. Evaluation findings

1.2.2.1. Promoting energy efficiency and use of renewable sources and reducing greenhouse gas emissions

In 2014-2020, support for the shift towards a low-carbon economy in the EU focused on energy production from renewables and improving energy efficiency in enterprises and public and private buildings. While it is clear that in many countries significant expenditure was allocated to projects of these kinds, evidence on the impact of the measures concerned is yet limited because projects are still underway and results take time to materialise.

For example, in Nordrhein-Westfalen, the focus of investment support was on the development of new renewable technologies, which means that the results in terms of the energy sources used are so far relatively limited and visible only in the medium-to-long term. Indeed, in many German Länder , the global visible effects are limited because of emphasis on the use of the ERDF to finance innovative projects.. This is, for example, the case in Bayern, where such an emphasis almost inevitably means that tangible outcomes in terms of energy use or improvements in efficiency are not yet evident. In addition, in a number of cases, funding went to increasing energy efficiency in SMEs and although there is evaluation evidence that this has been effective in the firms concerned (such as for instance in Rheinland-Pfalz), the global visible effects are limited because of the small size of firms supported.

Promoting energy efficiency and use of renewable sources was also one of the objectives of many Interreg programmes. Under the Germany-Netherlands Interreg OP, for example, pilot projects were undertaken to reduce CO_2 emissions and this has helped raise awareness of the opportunities for trans-border cooperation as regards product and process innovation.

1.2.2.2. Promoting sustainable multimodal urban mobility

Support from cohesion policy programmes across the EU in 2014-2020 went to the development or improvement in transport systems in cities to make them more environmentally-friendly, more accessible and safer. In Poland, for example, EU-funded investment in public transport projects helped to improve traffic flow and road safety in cities, as well as the connections between different modes of transport, while reducing air pollution. The evaluation of a new tramway in Florence, for example, found that it has strengthened the attractiveness of the city as a business centre and, by speeding up journey times, has made it more possible for people to commute from the peripheral areas served to the centre. By the same token, it has reduced the use of private cars and increased that of public transport.

Similarly, in the 2007-2013 period, ERDF support helped to create a more sustainable and integrated urban environment in Prague by improving barrier-free access to the metro system, improving bus and metro services and constructing a network of cycle path, while In Hungary, investment in intelligent transport systems helped to improve environmental sustainability.

1.2.2.3. Supporting adaptation to climate change and preventing disasters

In a number of countries, support for investment focused on strengthening resilience to natural disasters and improving systems for managing the risks involved. In Romania, projects funded have helped to improve the monitoring of severe weather events and so to limit floods, reduce the damage from these and provide appropriate emergency equipment. In the Polish region of Świętokrzyski, funding have helped to develop a disaster recovery system and improve the Volunteer Fire Brigade.

Funding was also allocated to this broad area under many Interreg programmes. In particular, joint measures for managing climate change were implemented under the Italy-France (Maritime) programme and the joint risk management projects undertaken under the Czech Republic-Poland programme increased the capacity of the authorities concerned to tackle crises and emergency situations.

1.2.2.4. Preserving and protecting the environment

In several countries, funding also went to projects to protect and preserve the natural heritage, which, along with supporting the cultural heritage, have helped to boost tourism, such as in the Polish region of Malopolskie. At the same time, many projects with a similar aim were financed by Interreg. These have helped to create a new environmental management system in the Northern Periphery and Arctic area, to protect cross-border ecosystems

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through developing green infrastructure in the Italy-France Interreg (Maritime) area and to boost the development of the circular economy through the more efficient use of natural resources under the France-Belgium-Netherlands-UK programme.

In the 2007-2013 period too, there are many examples of the support provided improving the environment, such as in Slovakia and Lithuania, where investment helped to improve air quality, in Estonia, where investment in modernising the water supply network gave 454 000 people access to clean drinking water, in Friuli, Venezia, Giulia in Italy, where support led to an increase in the accessibility of natural areas and improved the conservation of flora and fauna, and in Romania., where support for environmental investment increased the attractiveness of the country as a tourist destination.

Box 9.5 The Common Agricultural Policy

About 8.8 million people worked in agriculture in 2019 which corresponds to just under 5% of total employment in the Union. While employment in agriculture is generally less than 3% in the most developed EU countries, it remains a big employer in others, particularly in Romania, where it accounts almost one person in every four employed (23% in agriculture, hunting and related service activities in 2019).

Within the EU, the farming sector operates under the common agricultural policy (CAP). The objectives of the CAP in the 2014-2020 period (which has been extended to cover the years 2021 and 2022) are to support farmers and improve agricultural productivity, to ensure a stable supply of affordable food and that farmers can make a reasonable living, and to keep the rural economy alive by promoting jobs in farming, agri-food industries and associated sectors. The CAP includes the following measures:

- income support through direct payments to ensure income stability;
- market measures to deal with difficult market situations such as a sudden drop in demand due to a health scare or a fall in prices as a result of a temporary oversupply on the market;
- rural development measures to address the specific needs and challenges facing rural areas.

The CAP is financed through two funds which are part of the EU budget:

- the European agricultural guarantee fund (EAGF) provides direct support and finances market measures. It is referred to the "first pillar" of the CAP.
- the European agricultural fund for rural development (EAFRD) finances rural development support. It is referred to the "second pillar" of the CAP.

The EAFRD is aimed at improving the competitiveness of agriculture, encouraging sustainable management of natural resources and action in response to climate change and achieving a balanced territorial development of rural economies and communities[9]. It helps rural areas in the EU to respond to a wide range of challenges and opportunities that face them in terms of economic, environmental and social development.

The main beneficiaries of the EAFRD are located in the eastern and southern EU, though also in Ireland and some regions of France, Finland and Sweden (Map 9.5).

[9] In 2014-2020, the EAFRD was part of the five European Structural and Investment (ESI) Funds, which are aimed at financing investment in sustainable economic development in the EU. Since the CAP reform is to be in place by 2023, the EAFRD will not be governed by the Common Provisions Regulation for 2021-2027, though certain provisions will still apply.

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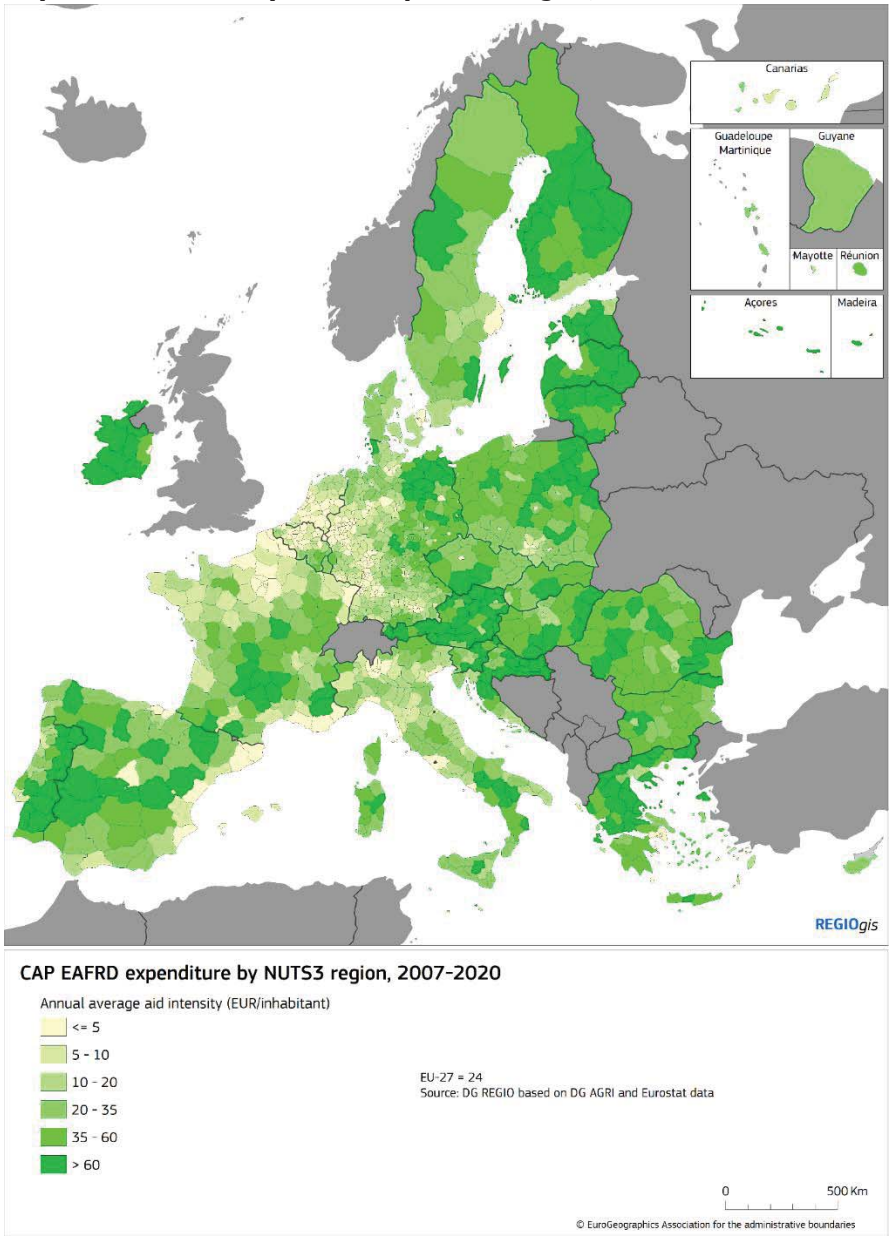
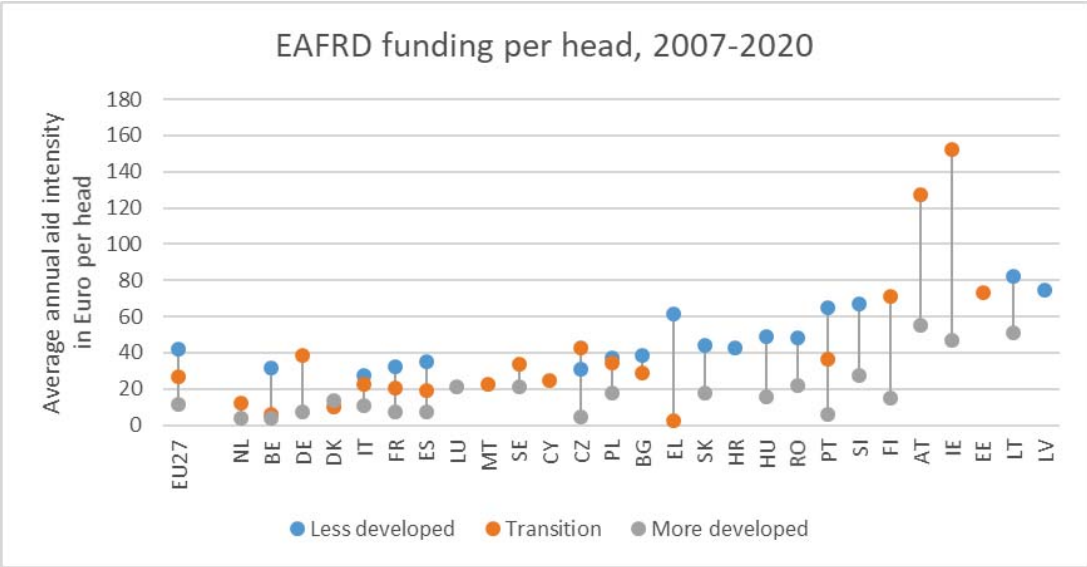
Map 9.4 CAP EAFRD expenditure by NUTS 3 region, 2007-2020



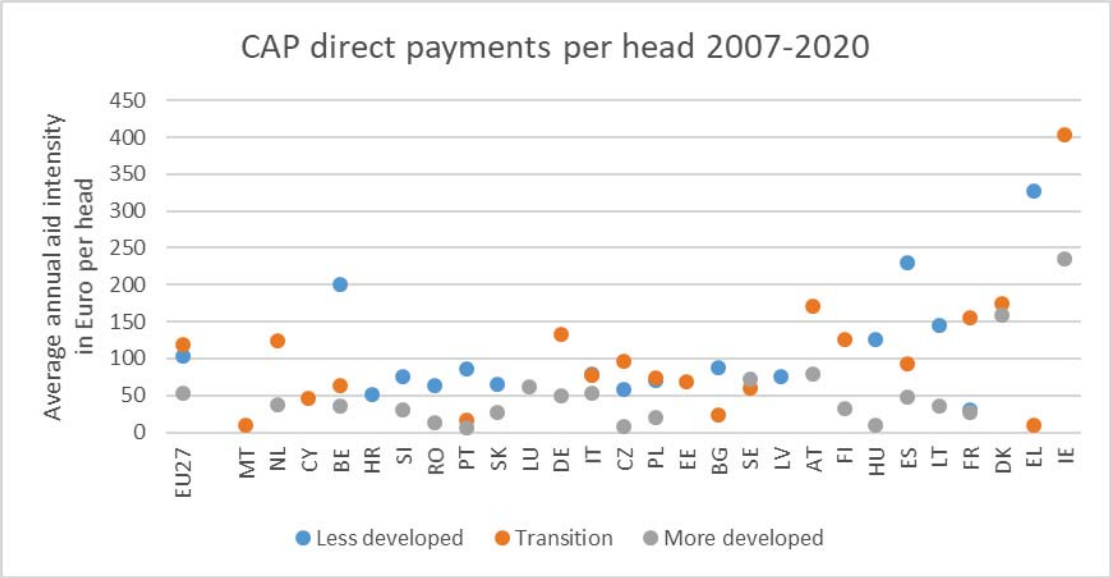
In general, aid intensity under the EAFRD is higher in less developed regions (averaging EUR 42 per inhabitant each year between 2007 and 2020) than in transition regions (EUR 27 per inhabitant) and more developed regions (EUR 12) (Figure 9.3). Aid intensity under the first pillar of the CAP is much higher, and it is highest in transition regions (EUR 119 per inhabitant), followed by less developed regions (EUR 103) and more developed regions (EUR 52) (Figure 9.4).

Figure 9.3: EAFRD average aid intensity, 2007-2020



Source: DG AGRI, EUROSTAT and DG REGIO calculations.

Figure 9.4: CAP average aid intensity, 2007-2020



Source: DG AGRI, EUROSTAT and DG REGIO calculations.

1.3 PO3 CONNECTED EUROPE

1.3.1. Progress in investment and monitoring of key outputs

Financing of EUR 64 billion from the ERDF and Cohesion Fund was allocated to the "Connected Europe" objectives in 2014-2020, targeting improvements in rail and road networks and other strategic transport goals This represented 18% of total cohesion policy funding for the period.

By the end of 2020, projects selected in pursuit of these objectives exceeded the EU funding available by around 14 %, while an estimated €37 billion of such funding (58% of the total available) had been spent on investment.

The investment concerned was mainly in the less developed Member States (those in receipt of the Cohesion Fund) and in less developed and transition regions elsewhere. The indicators show that just under 2 400 km of new roads had been constructed by the end of 2020, most of them on the TEN-T, and another 6 000 km had been upgraded

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(Table 9.3). In both cases, this amounts to around two-thirds of the targets set for 2023 while the completion of the projects selected would mean the lengths of road concerned exceeding the targets substantially.

Table 9.3 'Connected Europe' indicators: 2023 targets and achievements up to end-2020

	2023 target	Selected projects	Implemented, number and % of target
Total length of reconstructed or upgraded railway line (km)	5 260	4 590	1 540 29%
Of which TEN-T	*3 640*	*3 051*	*1 080* *30%*
Total length of newly built roads (km)	3 727	5 078	2 382 64%
Of which TEN-T	*2 500*	*3 530*	*1 680* *67%*
Total length of reconstructed or upgraded roads (km)	11 220	15 390	6 036 54%
Of which TEN-T	*870*	*918*	*727* *84%*

Source: Cohesion Open Data https://cohesiondata.ec.europa.eu/d/aesb-873i

On the other hand, the output of projects for upgrading the rail network up to the end of 2020, both those on the TEN-T and others, was well below the 2023 target, which is more typical of large scale multi-annual infrastructure investments, which usually need a significant amount of time to be completed (as in the case of the green investments above). However, in this case, the figures for projects selected suggest that the targets will not be achieved, which continues a long-term tendency evident in earlier periods for rail projects to experience more difficulty in being completed than road projects.

1.3.2. Evaluation findings

1.3.2.1. Support for enhancing mobility

Support for improving mobility in 2014-2020 was centred mainly on developing road and rail networks. This is particularly the case in Poland, where evaluations have verified that the objectives of the investment involved have largely been achieved. The construction of new roads and the upgrading of others have, therefore, improved road safety, reduced the number of accidents (in Poznań, by 54% and in Lublin, by 74% for instance), increased average vehicle speeds and shortened journey times, as well as reducing road noise and air pollution in cities. Investment in railways has also increased the capacity of the network, speeded up journey times and improved the connections between major cities and between the main economic centres. As a result, it has led to increased use of the railways in the country, though the quality of service still needs to be improved to attract more people.

As in the case of environmental infrastructure, transport projects typically extend over lengthy periods of time and many span two or even more programming periods. Moreover, since they tend to be part of networks, forming perhaps a section of a motorway or railway line, it is often the case that their effects cannot be fully assessed until other sections have been completed and the network as a whole is fully operational, which can take many years.

A number of evaluations of support for transport investment have, therefore, extended over the 2007-2013 period as well as the 2014-2020 one. In Estonia, the investment in railways undertaken in the two periods has improved the quality of rail travel, reduced journey times and led to the increased use of trains, expanding passenger numbers. The same is the case in Wales, where 70 stations in the East Wales and the Valleys regions were improved through ERDF support over the two periods.

Evaluations carried out in the 2014-2020 period on the effects of investment in the previous period show similar effects. They indicate a reduced number of road accidents in Poland and fewer traffic bottlenecks from investment

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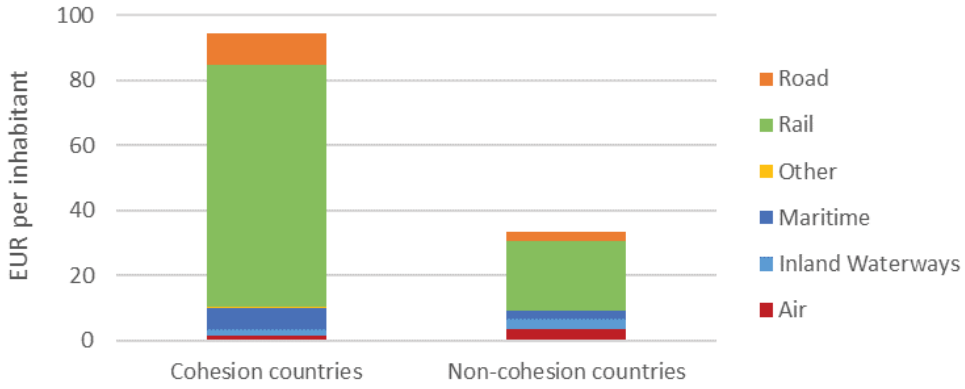
in new motorways and improved safety and reduced journey times in Latvia and Spain from the construction of new roads and upgrading of existing ones. In Latvia too, the modernisation of the rail network financed from EU funds made trains more competitive for both passenger and freight transport, increasing the use by both, while in Spain, modernisation and general improvements led to significantly reduced travel times, especially on high-speed train routes, and to increased passenger numbers.

Box 9.6 The Connecting Europe Facility

The Connecting Europe Facility (CEF) is an important funding instrument for EU transport policy, complementing the ESI funds by supporting cross-border projects and those to remove bottlenecks or build missing links on sections of European transport, energy and digital networks.

Over the 2014-2020 period, CEF funding amounted to EUR 22.6 billion, divided roughly equally between the Cohesion countries and other Member States, funding averaging EUR 95 per inhabitant in the former, almost three times more than in the latter (EUR 33) (Figure 9.5). In both groups, the bulk of funding went to rail transport. In the non-cohesion countries, the funding for air and inland shipping was more than in the Cohesion countries.

Figure 9.5: Connecting Europe Facility funding for Cohesion and other countries by transport mode, 2014-2020



Source: INEA, DG REGIO calculations.

In 2021-2027, the CEF will continue to fund major transport projects as well as digital and energy ones.

- It will have an overall budget of EUR 33.71 billion (at current prices), EUR 25.81 billion going to transport, including EUR 11.29 billion for Cohesion countries.
- For transport, it will help networks to become more interconnected, multimodal and safe by investing in the development and modernisation of railway, road, inland waterway and maritime infrastructure.
- Priority will be given to further developing the trans-European transport network (TEN-T), focusing on missing links and cross-border projects with an EU added-value. EUR 1.56 billion will go to financing major rail projects between Cohesion countries.

1.4 PO4 SOCIAL EUROPE

1.4.1. Progress in investment and monitoring of key outputs

Total funding of EUR 111 billion, mainly from the ESF and YEI but also from the ERDF (for infrastructure and equipment), was devoted to 'Social Europe' objectives targeting support for employment and labour market integration, education and training and social inclusion. Funding represents 31% of the overall cohesion policy budget for 2014-2020.

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By the end of 2020, EU funding for the projects selected under Social Europe was 1% more than the amount available, while an estimated €60 billion, or 54% of the EU allocation, had been spent on the projects concerned.

The common indicators cover all EU Member States in respect of the ESF and the 20 countries for the YEI where this applies[10] . They show that up to the end of 2020:

- there were 45.5 million participants in the programmes supported, including nearly 17.3 million who were unemployed and 17.2 million who were inactive (in the sense of not actively seeking employment)[11];
- 5.4 million participants in EU-funded schemes had found a job;
- 48% of participants had a low level of education (only up to compulsory schooling or less); and 15% were migrants, had a foreign background, or were from ethnic minorities;
- overall there were slightly more women (53%) than men among participants.

Three common indicators – one relating to investment in improving health services, one to investment in childcare and education facilities and one to investment in tourist and cultural infrastructure – are used to track the outcomes of ERDF support for Social Europe objectives (Table 9.4). The investment concerned on health and education is mainly undertaken in less developed and transition regions in eastern and southern Member States, though the indicator for investment in education is dominated by Italy. Support for investment in tourist and cultural sites is more widely spread and the indicator covers 17 Member States, with 6 (Poland, Italy, Spain, Portugal, France, and Hungary) predominating.

Table 9.4 'Social infrastructure indicators: 2023 targets and achievements up to end-2020

	2023 target	Selected projects	Implemented % of target achieved (2019)
Population covered by improved health services	66 470 000	88 880 000	53 307 000 80%
Capacity of supported childcare or education infrastructure (students)	17 800 000	25 333 000	19 757 000 111%
Increase in expected number of visits to supported sites (cultural, natural heritage and attractions)	64 000 000	69 950 000	25 360 000 40%

Source: Cohesion Open Data https://cohesiondata.ec.europa.eu/d/aesb-873i

Up to the end of 2020, the health service facilities constructed covered 53.3 million people, already 80% of the target for 2023, and if projects selected for funding go ahead, then some 88.9 million will be covered by improved services, well above the target. Investment in childcare and education infrastructure had already improved or increased capacity for 19.8 million children or students by the end of 2020, well above the target, and if the projects selected are completed, this will increase to over 25 million. The outcome of investment in tourist and cultural sites is more modest in relation to the target, with an increase in visitor numbers to the sites concerned of 25.4 million by end-2020, only40% of the target for 2023. In this case, however, the dramatic effect of the Covid-19 pandemic might well see visitor numbers fall well short of the target.

Indeed, the pandemic has already had a massive effect on tourism and visits to cultural sites and put a significant strain on healthcare facilities. There has been a large net increase in planned allocations to health services, but it is not yet clear to what extent the response to the pandemic has also led to the investment originally planned for

[10] The common indicators under "Social Europe" come from two separate monitoring systems, which differ because of the different projects and measures supported, though both sets of indicators show what has been funded and the immediate outcomes. For the countries in which YEI applied, see: https://cohesiondata.ec.europa.eu/funds/yei

[11] It should be noted that this number relates to individual 'participations' rather than individual people, in the sense that any person can have participated in a number of programmes.

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strategic improvements in the capacity of the services being diverted away to cope with the increased numbers requiring care.

1.4.2. Evaluation findings

1.4.2.1.Support for the employability of the non-employed

A large proportion of the ESF in 2014-2020 has gone to helping people, especially young people, to find work, the measures funded, often being combined into a tailor-made support package and taking the form of training programmes, traineeships and work experience. A number of evaluations find that the chances of a person being employed are increased significantly by participation in such measures. In Italy, for example, traineeships supported in Marche increased employment rates among participants by 13-15 percentage points 12 months after the traineeship ending as compared with a comparable group of non-participants (i.e. the control group). The same is true of voucher schemes in Piemonte, where 16 months after using them, 41% of participants were in employment as against 30% for the control group.

Similarly, in Germany, support for measures to help integrate the non-employed into the labour market, especially the long-term unemployed led, by the end of 2019, to 43% of participants being in employment 15 months afterwards, 10 percentage points more than for non-participants. In Poland, measures targeted at young people are found to have increased the chances of the long-term unemployed, the low educated and those from villages and rural areas finding a job.

The funding provided in Poland also helped participants to improve their entrepreneurial skills, 14% of them starting their own business within 6 months of receiving training. Other successful examples of ESF measures leading to the creation of new businesses are in Śląskie, in Poland, where support was found to be crucial to the establishment of new start-ups and to their chances of survival (it is estimated that without support 45% start-ups would not have been established), and in Piemonte in Italy, where new businesses supported had a 10 percentage point higher probability of being in operation 4 years after being formed than non-supported ones

1.4.2.2 Support for the adaptation of employees and enterprises to change

ESF financing has also gone to improving the skills of those already in work, as well as of entrepreneurs, so that they are able to adapt better to changing market conditions. In Sachsen-Anhalt, in Germany, the training funded improved the labour market situation of employees, 48% of participants performing an activity requiring more qualifications afterwards and over a third being given more responsibilities. In Thüringen, the support given to SMEs to recruit skilled workers from abroad led to firms being able to employ more of them.

1.4.2.3.Support for active inclusion

The ESF was also targeted at helping the vulnerable and disadvantaged to find work. In Asturias, in Spain, the 'Integrated Activation Pathways' scheme was found not only to increase the chances of vulnerable people finding a job but also to reduce markedly their risk of suffering a mental disorder (this being cut by around 45% after participation in the scheme). In Toscana, in Italy, measures tailored to the needs of people with disabilities and other disadvantaged groups, led, between October 2018 and November 2019, to 20% of recipients having a job one year after receiving support.

1.4.2.4. Support for healthcare infrastructure and services

In many of the less developed Member States, a significant part of the ESF went to support of health services and this was complemented, in some cases, by ERDF investment in buildings and equipment. A number of evaluations found that the projects concerned increased access to healthcare and improved its quality. In Lithuania, for example, the projects funded were found to have helped to reduce mortality from cardiovascular diseases and the suicide rate.

1.4.2.5. Support for good quality education

Measures to improve the quality of education and increase access to schooling were included in many ESF programmes, especially in less developed Member States and regions. In Thüringen, in Germany, measures supporting the active participation of young people in learning were found to have reduced early school leaving and

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improved the integration of migrants, as well as attitudes towards school. The training of teachers also facilitated the development of new methods of communication and conflict resolution.

In Lithuania, where support was targeted at higher education, it led to universities becoming more internationalised, with foreign students accounting for 8% of the total and around 1 600 domestic students spending part of their studies abroad.

1.4.2.6. Support for transition from education to work

EU funding was also directed at improving the links between education and the labour market, to ensure closer correspondence between teaching, qualifications and employer needs. Measures to strengthen vocational education in Podlaskie, in Poland, helped students to choose suitable courses, increased cooperation of VET schools with employers and improved teachers' competences in advising on career choices. In Mecklenburg-Vorpommern, in Germany, measures to facilitate the transition from education into work involved local entrepreneurs identifying suitable companies for visits and work placement, so helping students discover whether occupations fitted their skill-sets and interests.

In Marche, in Italy, the technical training courses supported increased the chances of participants being in employment 12 months after, especially women. In Piemonte too, participation in the VET courses receiving ESF support led to a higher probability of being in work afterwards (up to 20 percentage points higher than for non-participants).

1.4.2.7. Support for culture and sustainable tourism

In addition to providing labour market support, significant cohesion policy funding also went into preserving cultural sites and encouraging sustainable tourism. Evaluations have identified a number of instances where support produced positive results. These include investment in safeguarding the archaeological site at Pompei and improving accessibility, which helped to increase visitors by 62% between 2012 and 2019, directly adding some 1.9 million to their number. They also include investment in natural and cultural assets in Świętokrzyskie, which has led to the creation of an integrated network of tourist sites in the region.

Projects to preserve cultural sites and strengthen the cultural heritage have been important in furthering cross-border cooperation too, such as under the Bayern- Czech Republic Interreg programme and under the Estonia-Latvia programme.

1.5 PO5 Europe Closer to citizens

1.5.1.Progress in investment and monitoring of key outputs

Unlike the other Policy Objectives, 'Europe Closer to citizens' cannot easily be matched to the Thematic Objective classification used for the 2014-2020 period. Nevertheless, investment in Community-led local development (CLLD), support for Integrated Territorial Investment (ITI) and other territorial measures relating to urban regeneration in particular, which form a large part of this Policy Objective and which were funded under various Thematic Objectives, can be tracked.

Overall EU support amounting to EUR 31 billion from the ERDF, ESF and Cohesion Fund is estimated to have been devoted to 'Europe Closer to Citizens' for the period, just under 10% of the overall cohesion policy budget.

At the end of 2020, projects selected under this Objective entailed EU funding of EUR 27.5 billion, 11% less than the amount allocated, while an estimated €12 billion, 39% of the allocation, had been spent on investment. This is less than in the case of the other Policy Objectives, reflecting the fact that much of the investment concerned involves mobilisation of local communities and/or the formulation of development plans involving a number of different sectors or aspects, which tend to increase the time needed for carrying it out.

The common indicators show that 15.2 million square metres of open space had been created or rehabilitated through the investment undertaken up to end-2020 and that if the projects selected are completed and deliver what they plan, this will be increased to 53.4 million by the end of 2023 (Table 9.5). They also show that, although the

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buildings constructed or renovated in the urban areas supported amounted to only 30% of the target in terms of the space involved, the target will be exceeded if the projects selected are completed.

Table 9.5 'Europe closer to citizens' indicators: 2023 targets and achievements up to end-2020

	2023 target	Selected projects	Implemented % of target
Population living in areas with integrated urban development strategies	42 695 000	44 714 000	25 279 000 59%
Open space created or rehabilitated in urban areas (sq. metres)	39 910 000	53 427 000	15 221 000 39%
Public or commercial buildings built or renovated in urban areas (sq. metres)	2 403 000	3 075 000	716 000 30%

Source: Cohesion Open Data https://cohesiondata.ec.europa.eu/d/aesb-873i

1.5.2. Evaluation findings

1.5.2.1. Support for urban development and regeneration

A deliberate effort was made in the 2014-2020 programming period both to involve local communities in the design and implementation of measures to develop and regenerate urban areas and to make them more socially inclusive. At the same time, a conscious attempt was made to ensure that the measures concerned were properly integrated into a development strategy which took explicit account of the interaction between measures and the potential complementarity, and reinforcing nature, of their effects. Two cross-cutting instruments were created as part of these efforts: Community-led local development (CLLD) and Integrated Territorial Investment (ITI). Although, because of the nature of the investments concerned and the long time-scale over which their results are likely to become visible, there is limited evidence so far on their effects. Nevertheless, a number of evaluations have indicated that they have been implemented successfully in many places across the EU.

For example, in Poland, local development strategies in Podlaskie were found to have been formulated with the close involvement of local people and organisations, and that many who had not previously applied for EU funding had submitted projects for CLLD funding, with a focus on how their projected results would further the overall strategy. In Świętokrzyskie, the ITI approach to policy-making in respect of investment in natural and cultural assets was found to have worked efficiently and effectively and to have helped increase the attractiveness of the areas concerned, reducing the pace of the decline in biodiversity and increasing the opportunities for tourism.

In the Netherlands, the ITI approach in Amsterdam, the Hague, Rotterdam and Utrecht has led to the closer integration of social with economic aspects of policies and increased cooperation between municipalities, schools and companies., while in Bretagne, it has helped to improve cooperation between the Regional Council and local people and organisations on the ground.

Evaluations carried out in 2014-2020 of the effects of integrated urban development strategies financed by the ERDF in the 2007-2013 period also show positive results. In Lubelskie, again in Poland, the regeneration projects funded increased the attractiveness of the areas redeveloped as places to live, work and locate investment in. In Romania, the investment financed helped to improve public spaces, stimulate economic and social activity, reduce traffic congestion and increase traffic safety, raise visitor numbers and revitalise cultural life as well as to develop new social services.

1.5.2.2. Support for cross-border cooperation at local level

In a number of cases, the measures funded led to increased cooperation between local bodies in different countries and wider involvement of locals in decision-making, so laying the basis for more inclusive and effective policies.

Under the Bayern-Czech Republic Interreg programme, for example, the projects supported led to increased institutional cooperation and networking across the border at the local level. The same is true of measures financed

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under the Czech Republic-Poland Interreg programme which also increased long-term cooperation between local bodies on the two sides of the border.

2. Interreg

The sections above include the Interreg programmes financed under the European Trans-national Cooperation objective, under which funding was also allocated to the 11 Thematic Objectives which cohesion policy was aimed at pursuing. In total, some EUR 10.1 billion went to Interreg over the 2014-2020 period, around two-thirds going to regional cross-border programmes, the rest going to transnational and interregional programmes (Map 9.5).

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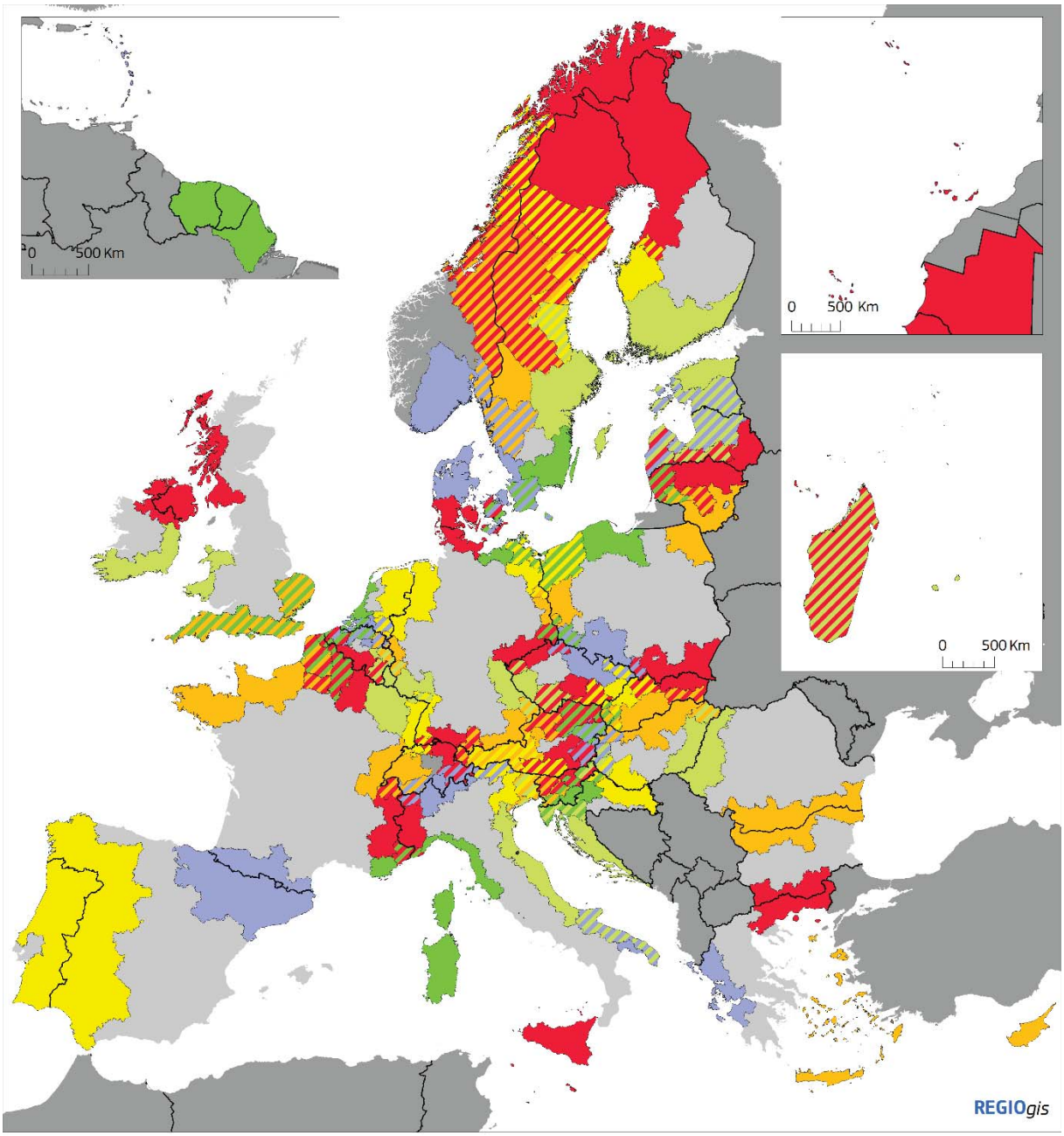
Map 9.5 ERDF Cross-border cooperation programmes, 2014-2020



ERDF Cross-border cooperation programmes, 2014-2020

This map shows the areas of the cross-border programmes co-financed by the ERDF.
Each programme area is shown with a specific colour.
Hatched areas are part of two or more programme areas simultaneously.

Source: DG REGIO

0 500 Km

© EuroGeographics Association for the administrative boundaries

The indicators for the expenditure funded under the Interreg programmes show that in many cases the targets set to be achieved by 2023 had already been reached by the end of 2020, which suggests perhaps that these could

have been set at a more ambitious level (Table 9.6). aAmost 25 000 enterprises had, therefore, received support to cooperate with firms in neighbouring countries, substantially above the 2023 target, while over 11 000 research institutes had similarly been involved in cross-border cooperation, around 5 times the target and over twice as many young people had participated in cross-border youth schemes as targeted. On the other hand, only around half the target number of people had participated in cross-border labour mobility measures, though given that there another three years to go before expenditure needs to be completed, the target remains in reach..

Table 9.6 Interreg indicators: 2023 targets and achievements up to end-2019

	Target values (number)	Implemented values (number)	Implemented relative to target (%)
Firms engaged in R&D cross-border cooperation	10,319	24,879	241%
Research Institutes involved in cross-border cooperation	2,265	11,206	495%
Participants in cross-border labour mobility measures	194,080	132,629	68%
Participants in cross-border labour and training programmes	65,740	108,282	165%
Participants in cross-border inclusion measures	31,900	15,771	49%
Participants in cross-border youth schemes	62,761	147,535	235%

Source: Cohesion Open Data https://cohesiondata.ec.europa.eu/d/aesb-873i

3. Part 2 Macroeconomic impact of funding

Assessing the impact of cohesion policy at macroeconomic level is particularly challenging. Monitoring data obtained from the programmes generally concern the output or, at best, the outcome of the interventions but they cannot provide information on their net overall impact on the economy. The programmes produce many direct, but also indirect, economic effects, which are difficult to estimate, not least because of the interaction between them.

For instance, output and employment may increase in the SMEs supported but at the same time they may decrease elsewhere due to the firms assisted becoming more competitive than others and taking market shares away from them . In net terms, therefore, there may be little overall increase in output, or at least one which is much smaller than the direct effects indicate. Cohesion policy also generates important spill-over effects and externalities outside the economies in which the investment takes place. For example, investment implemented in the main recipient countries boosts local demand, which is partly met by exports from other countries, notably from the more developed Member States, which, therefore, indirectly benefit from the policy. Equally, the projects funded may require equipment or other inputs produced in the latter countries, which adds to their exports and so to GDP.

In the recipient country, cohesion policy funding generates short-term (mostly demand) and long-term (supply-side) effects. While the former principally emerge during the implementation of the programmes, the latter are likely to build up progressively over time and last long after the expenditure involved has come to an end.

At the same time, cohesion policy must be financed and the cost involved, in terms of the taxes or other charges levied, also needs to be taken into account when assessing the overall impact of the policy.

Macroeconomic models can take explicit account of the above issues in a consistent and comprehensive way and so are well-suited to assessing the global impact of cohesion policy. In the following, a model developed by the European Commission's Joint Research Centre (JRC) in collaboration with DG REGIO (RHOMOLO[12]) is used to assess the impact of the 2014-2010 programmes on the economies of the NUTS 2 regions across the EU.

[12] RHOMOLO is a dynamic spatial computable general equilibrium (CGE) model. Its purpose is to enable the analysis of investment and structural reforms scenarios. Its economic foundations are based on the well-established literature on

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3.1 2014-2020 Cohesion policy programmes

In the past few decades, funding for cohesion policy has been the second largest item in the EU budget, accounting for around a third of the multi-annual financial framework. For the 2014-2020 period, it amounted to EUR 355 billion (at current prices), as indicated above. This corresponds to around 0.3% EU GDP, but in some of the main recipient countries and regions, the figure is very much higher, financing a substantial part of public investment (as noted in Chapter 8 above).

Funding mainly goes to the less developed regions and Member States. In some countries, it represents more than 2% of GDP a year on average in the period, peaking at 2.5% in Croatia. For some less developed regions, such as in Região Autónoma dos Açores in Portugal or Észak-Alföld in Hungary, the funding provided is even larger, amounting to over 3.5% of GDP a year on average (Map 9.6).

general equilibrium models. RHOMOLO has featured in numerous articles contributing to this literature (see for instance Lecca et al., 2020, and Di Pietro et al., 2020).

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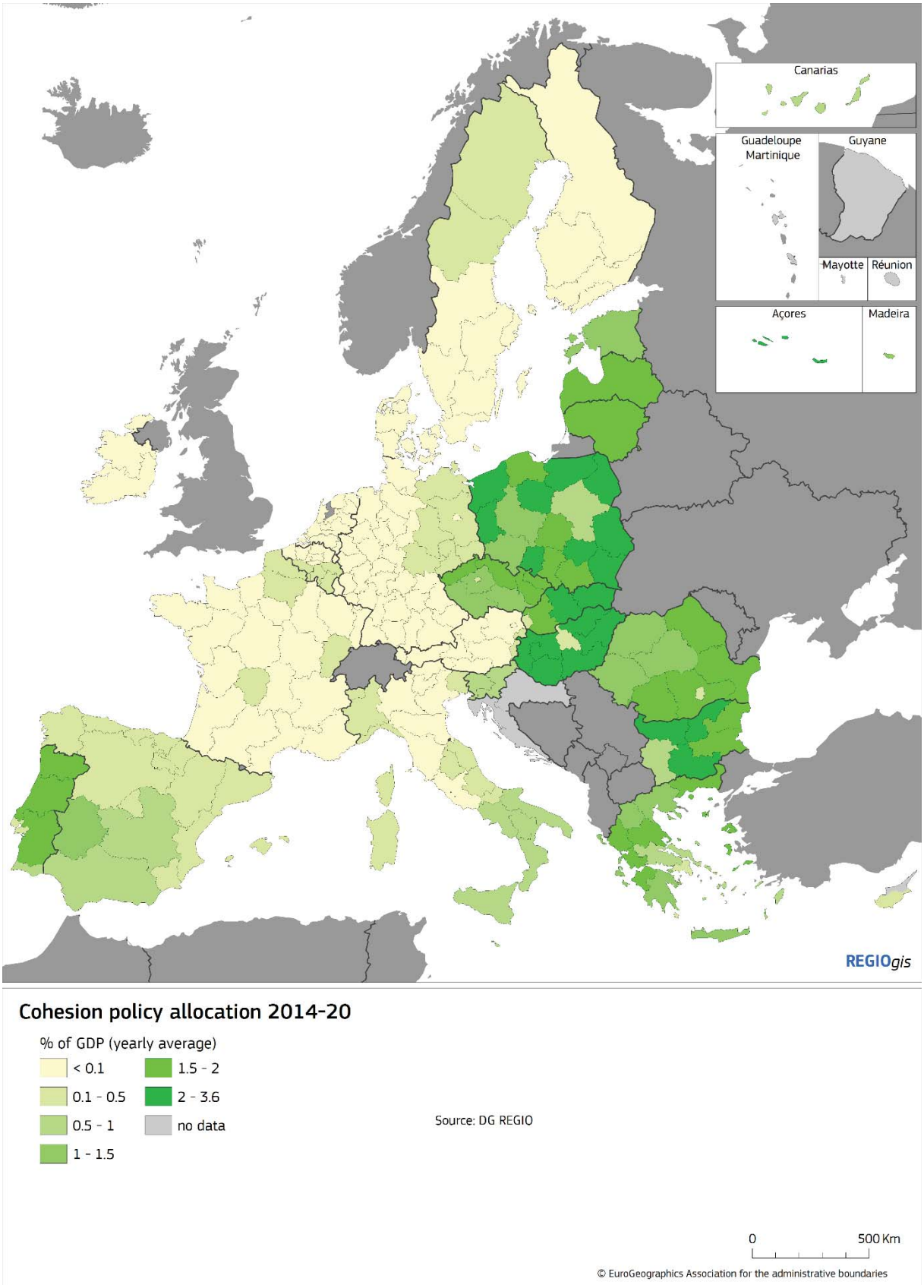
Map 9.6 Cohesion policy allocation 2014-2020, % of GDP of NUT 2 regions, yearly average



Source: DG REGIO.

Cohesion policy investments are concentrated on key areas of intervention for fostering growth and development. For the purpose of the present analysis, cohesion policy funding is regrouped into six areas:

- **Investment in transport infrastructure** (TRNSP), which generates demand-side effects in the short-run in the form of the purchase of goods and services required to build the infrastructure. On the supply-side, it reduces transport costs and stimulates trade flows.
- **Investment in other infrastructure** (in telecommunications, energy, environmental, health and social infrastructure - INFR), which is modelled as public investment when it affects business operations, or as government consumption otherwise. The former generates supply-side effects since it tends to reduce the cost of production or facilitates increases in productivity, while the latter only produces short-term demand-side effects.
- **Investment in human capital** (in education and vocational training and active labour market policies - HC), which are assumed to increase government current expenditure in the short run. On the supply side, some of this investment is assumed to increase labour productivity through education and training, while the other part (active labour market policies especially) are assumed to increase labour supply.
- **Investment in R&D** (support to RTDI, establishment of networks and partnerships between businesses and research centres - RTD), which is assumed to stimulate private investment leading to an increase in total factor productivity (TFP).
- **Aid to the private sector** (support to SMEs, provision of credit, funding to improve tourist and cultural sites, facilities and activities - AIS), which is assumed to increase private investment through a reduction in the cost of capital, but without any TFP effects[13].
- **Technical assistance** (support for administrative capacity building, monitoring and evaluation - TA), which is modelled as an increase in public current expenditure on goods and services, with no supply-side effects.

The distribution of funding across the areas of interventions varies from one region to another, reflecting the policy mix resulting from the programme design. In general, the share of funding allocated to transport and other infrastructure is larger in the less developed regions and Member States, while the most developed ones devote a larger share to support of R&D, aid to the private sector and investment in human capital. For instance, in Romania, over 62% of funding is allocated to investment in transport and other infrastructure, while in the Netherlands, only 12% goes to this and 82% is allocated to RTD and human capital (Table 9.7).

Table 9.7 Cohesion policy allocation by area of intervention, 2014-2020

% of total	RTD	AIS	TRNSP	INFR	HC	TA	Total
AT	26.3	15.2	4.2	16.0	34.0	4.4	100
BE	20.1	8.3	4.2	17.2	47.1	3.1	100
BG	11.3	7.0	24.9	33.6	19.5	3.7	100
CY	9.1	12.8	14.8	36.1	24.0	3.2	100
CZ	16.6	3.3	27.9	31.4	16.8	3.9	100
DE	27.4	7.0	3.2	20.3	38.5	3.6	100
DK	41.2	0.5	2.3	6.2	45.0	4.7	100
EE	22.9	6.7	15.3	35.7	16.5	3.0	100
EL	7.8	15.7	16.9	30.0	26.0	3.6	100
ES	16.1	10.9	9.6	30.5	31.1	1.9	100
FI	39.5	13.3	2.7	5.6	35.3	3.5	100
FR	19.5	6.1	4.3	23.0	43.3	3.8	100

[13] Some categories of intervention classified as AIS are considered as public consumption as they are not likely to affect investment decisions.

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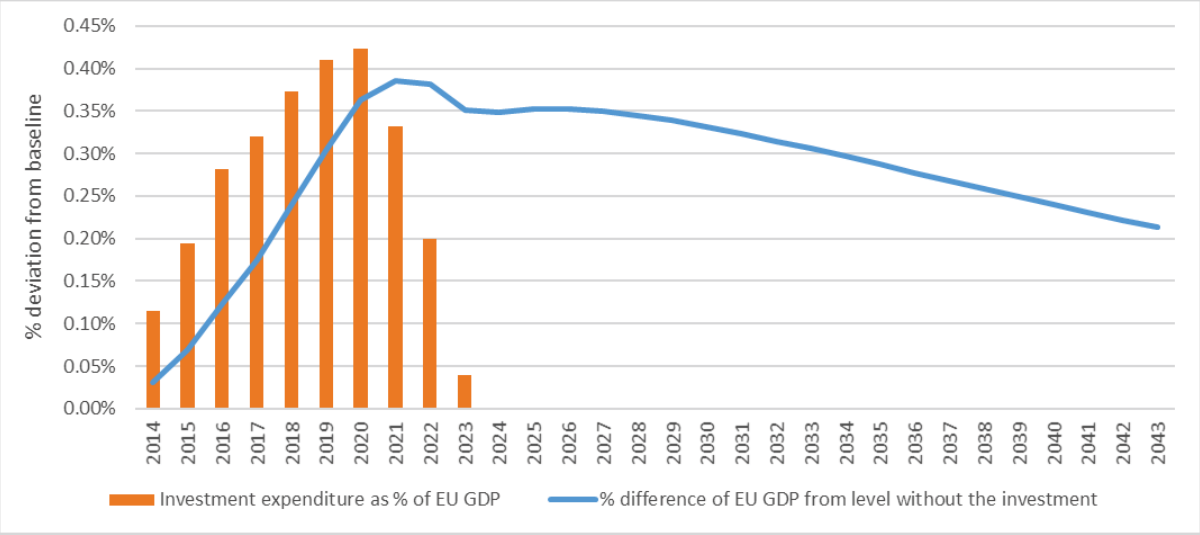
HR	9.1	16.0	15.1	37.6	18.1	4.0	100
HU	10.4	15.0	17.6	33.4	22.2	1.6	100
IE	6.8	2.0	0.9	39.4	48.7	2.1	100
IT	12.4	15.4	10.1	24.7	34.0	3.3	100
LT	17.1	3.0	15.4	42.9	18.5	3.1	100
LU	9.8	0.1	4.2	9.0	74.6	2.3	100
LV	14.7	6.5	27.8	33.1	15.5	2.4	100
MT	9.1	7.0	16.6	45.6	18.8	2.8	100
NL	39.7	1.7	0.5	11.6	42.2	4.3	100
PL	14.1	4.2	35.8	26.8	15.8	3.3	100
PT	19.9	12.3	7.5	22.8	34.8	2.7	100
RO	4.8	8.7	29.6	32.7	20.9	3.3	100
SE	31.6	8.4	5.7	10.2	39.8	4.3	100
SI	23.7	4.3	12.2	32.5	23.3	4.0	100
SK	9.8	7.8	27.2	32.4	18.8	4.1	100
EU-27	14.7	8.9	19.8	28.3	25.1	3.2	100

Source: DG REGIO.

3.2. Impact of 2014-2020 cohesion policy

The model simulations suggest that cohesion policy in 2014-2020 had an increasingly positive effect on EU GDP over the period of expenditure, reaching a peak in 2021 when GDP is estimated to be 0.4% higher than it would be without it (Figure 9.6). The estimated impact continues to be substantial long after the end of the implementation period[14] because of the supply-side effects. In the medium and long run, increases in productivity and stocks of private and public capital as well as reductions in transport costs continue stimulating economic activity and GDP. Even 30 years after the initial investment, GDP is still estimated to be 0.2% higher than it would be if the investment had not taken place.

Figure 9.6 Impact of cohesion policy investment, 2014-2020, on EU GDP2014-2043



Source: RHOMOLO.

[14] The N+3 rule allows funds to be used up to three years after they have been committed which implies that the period during which programmes are actually implemented runs from 2014 to 2023.

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The estimated impact of the policy shows wide regional variations both at the end of the implementation period (Map 9.7) and in the longer term (Map 9.8, which shows the estimated effects 20 years after the programmes come to an end). This reflects differences in the scale of funding regions received, the fact that the policy mix varies markedly from one region to another, even within the same Member State, and the features of the regional economies themselves, including how they are placed to benefit from spill-over effects, which also affect the magnitude of the policy impact.

During the implementation period, the impact is mainly the result of demand-side effects from increased investment and consumption, while after the programmes come to an end, the impact comes solely from the supply-side effects on labour and total productivity, reductions in transport costs, and the increased private and public capital stocks.

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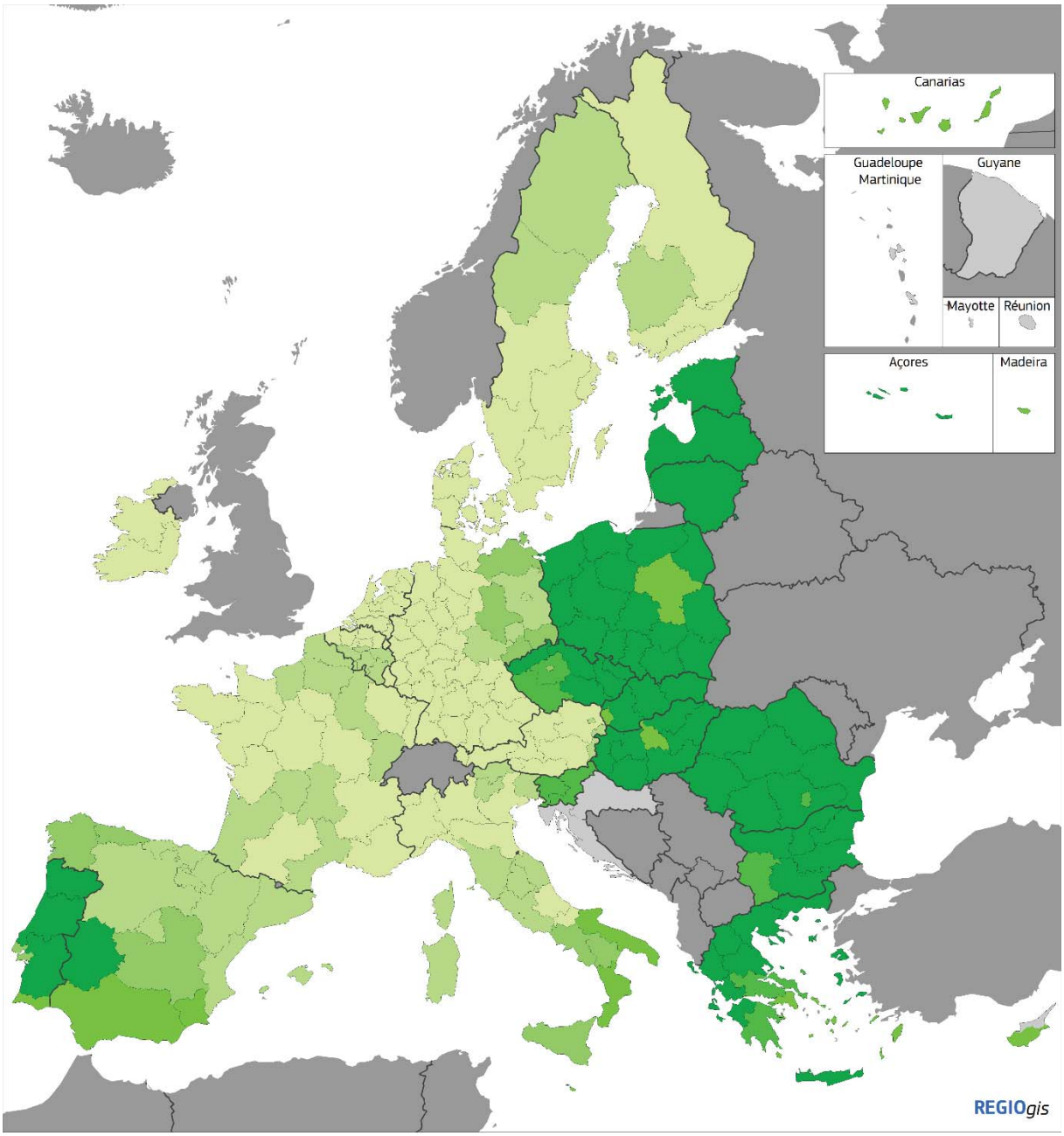
Map 9.7 Impact of the 2014-2020 cohesion policy programmes on GDP in NUTS 2 regions in 2023



Impact of the 2014-2020 cohesion policy programmes on GDP in 2023

% above baseline

- <= 0.1
- 0.1 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- > 2
- no data

Source: RHOMOLO

0 500 km

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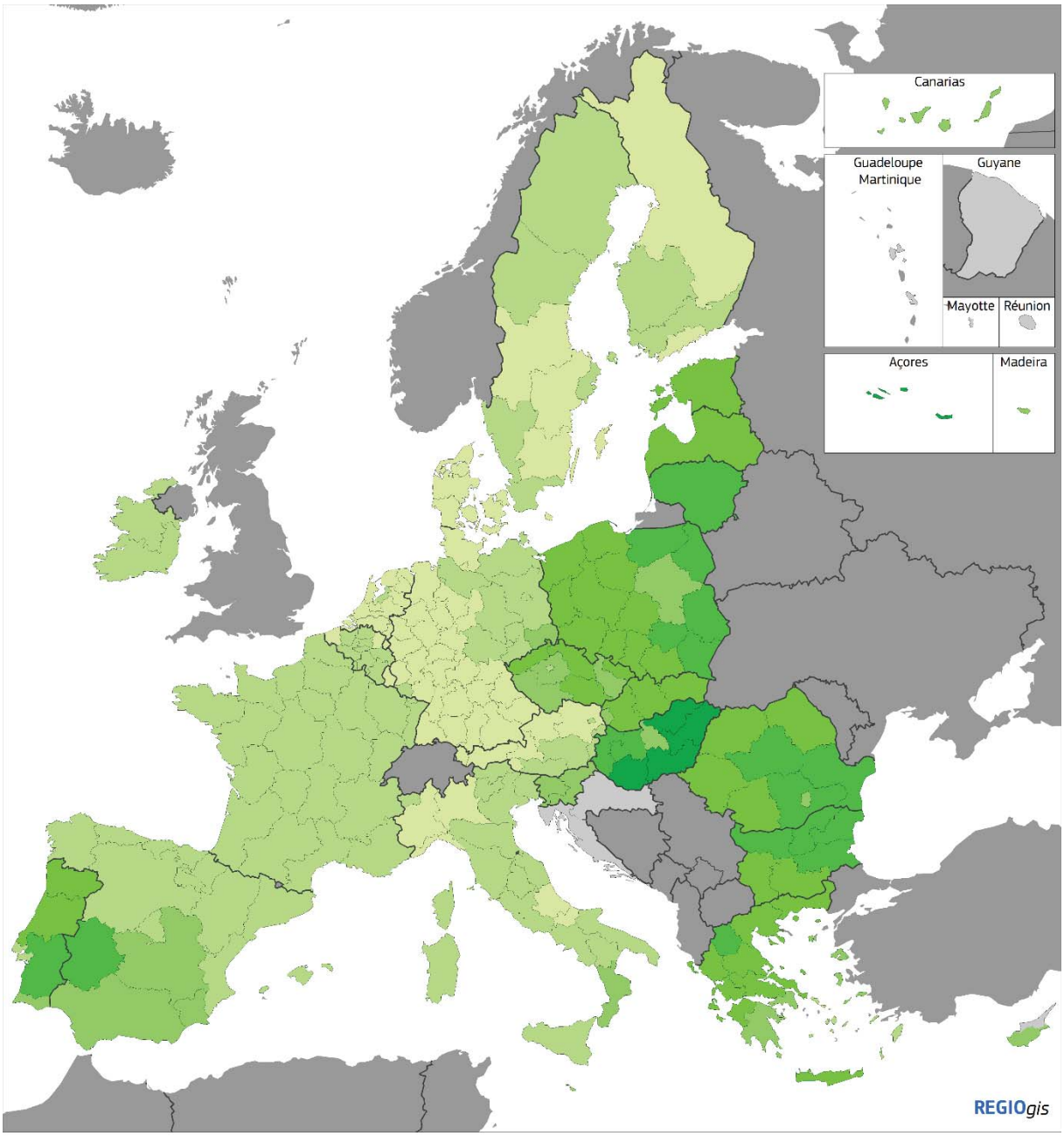
Map 9.8 Impact of the 2014-2020 cohesion policy programmes on GDP in NUTS 2 regions in 2043



Impact of the 2014-2020 cohesion policy programmes on GDP in 2043

% above baseline

- <= 0.1
- 0.1 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- > 2
- no data

Source: RHOMOLO

0 500 km

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In the short run, the impact of the policy is largest in the main recipient regions, i.e. in those in eastern Europe, Portugal and the south of Spain. By the end of the implementation period, GDP in Croatia, Latvia and Lithuania is, respectively, some 5%, 4% and 3% higher than in a scenario without cohesion policy. At the regional level, the impact of the policy peaks at more than 5% in the Hungarian regions of Észak-Alföld and Dél-Alföld and the Portuguese Região Autónoma dos Açores. There are also significant differences between regions within countries, such as in Hungary, where the estimated impact on GDP ranges from 1.1% to 5%, in Poland, where it ranges from 1.5% to 3.9%, in Romania, where it varies from 1.8% to 2.9%, and in Portugal, where it varies from 0.6% to 5.2%.

The impact is less, and in some cases negative, in the more developed regions, reflecting the small amount of funding received relative to GDP and the fact that they are responsible for financing a large share of the investment concerned. However, in the longer run, the impact becomes positive everywhere. After the end of the implementation period, there is no longer any expenditure, and so no longer any taxes or charges to levy to fund this, but the positive supply-side effects continue.

The policy also gives rise to large spatial spill-over effects, in the sense that the investment undertaken in one region has an impact on other regions as well, notably through trade flows. These effects tend to be larger for small open economies with narrow industrial and R&D bases, where many goods and services critical for the implementation of Cohesion policy programmes – and their economic development – are not produced domestically but need to be imported. The policy helps to accelerate development in these economies which leads to higher levels of imports of a wide range of goods and services from their more advanced trading partners, which accordingly tends to increase their GDP[15].

Two major points emerge from the model simulations:

- Overall, the impact of cohesion policy on GDP in EU regions is negatively correlated, if only weakly, with their level of GDP per head (correlation coefficient, -0.15). This implies that cohesion policy tends to produce a disproportionately large effect in the less developed regions of the EU, in line with the policy's mandate to reduce regional disparities.
- In the long run, all regions in the EU benefit from the policy, which indicates that the policy gives rise to a positive sum game, or a win-win situation.

The policy, therefore, represents good value for money. The overall long-term impact on GDP of each euro spent when all of the effects materialise is both positive and significant. The cumulative increase in EU GDP from the investments funded by cohesion policy is less than the cumulative amount of funding allocated to the policy in the short-term – i.e. the benefits are estimated to be smaller than the costs. But after the programmes come to an end and there are no longer any costs being incurred, the benefits continue and begin to outweigh the costs, increasingly so as time goes on. It is estimated that 15 years after the end of the implementation period, each euro spent on the policy will have generated 2.7 euros of additional GDP at EU level, which corresponds to a rate of return of around 4% a year.

[15] Monfort and Salotti (2021) analyse the spatial spill-overs generated by the 2007-2013 Cohesion policy programmes, with a focus on those generated in the net beneficiaries and spilling over to the policy net contributors. They find that in the long run, around 15% of the policy impact on EU GDP is due to international spill-over effects between Member States. On average, in the more developed countries (those not eligible for the Cohesion Fund), around 45% of the impact is due to the programmes implemented in the main beneficiaries.

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