Analysis of the main territorial challenges, needs and transnational cooperation potentials in central Europe

Annex 1: Analytical report

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Table of contents

1. Introduction 8

1.1. Update October 2020 9

1.1.1. Central Europe 2021+ characteristics 10

1.1.2. Reflections on the COVID-19 pandemic 15

2. A smarter Europe (PO1) 17

2.1. Introduction 17

2.2. Enhancing research and innovation capacities and the uptake of advanced technologies 17

2.2.1. The challenges 18

2.2.2. Policy needs and potentials 22

2.3. Reaping the benefits of digitisation for citizens, companies and governments 25

2.3.1. The challenges 26

2.3.2. Policy needs and potentials 31

2.4. Enhancing growth and competitiveness of SMEs, including by productive investments 32

2.4.1. The challenges 33

2.4.2. Policy needs and potentials 36

2.5. Developing skills for smart specialisation, industrial transition and entrepreneurship 38

2.5.1. The challenges 38

2.5.2. Policy needs and potentials 44

3. A greener, low-carbon Europe (PO2) 46

3.1. Introduction 46

3.2. Energy efficiency and reducing GHG emissions 47

3.2.1. The challenge 47

3.2.2. Policy needs and potentials 49

3.3. Renewable energy 50

3.3.1. The challenge 50

3.3.2. Policy needs and potentials 52

3.4. Smart energy systems, grids and storage 53

3.4.1. The challenge 53

3.4.2. Policy needs and potentials 55

3.5. Climate change adaptation, risk prevention and disaster resilience 56

3.5.1. The challenge 56

3.5.2. Policy needs and potentials 58

3.6. Sustainable water management 59

3.6.1. The challenge 59

3.6.2. Policy needs and potentials 60

3.7. Circular economy 62
3.7.1. The challenge 62
3.7.2. Policy needs and potentials 65

3.8. Nature protection and biodiversity, green infrastructure in urban environment and reducing pollution 66
3.8.1. The challenge 66
3.8.2. Policy needs and potentials 71

3.9. Sustainable multimodal urban mobility 73
3.9.1. The challenge 73
3.9.2. Policy needs and potentials 75

4. A more connected Europe (PO3) *77*

4.1. Introduction 77

4.2. Enhancing digital connectivity 77
4.2.1. The challenge 77
4.2.2. Policy needs and potentials 81

4.3. Developing a sustainable, climate resilient, intelligent, secure and intermodal TEN-T 82
4.3.1. The challenge 82
4.3.2. Policy needs and potentials 85

4.4. Developing and enhancing sustainable, climate resilient, intelligent and intermodal national, regional and local Accessibility, including improved access to TEN-T and cross-border mobility 86
4.4.1. The challenge 86
4.4.2. Policy needs and potentials 94

5. A more social Europe (PO4) *97*

5.1. Introduction 97

5.2. Enhancing the effetiveness of labour markets and access to quality employment 99
5.2.1. The challenge 99
5.2.2. Policy needs and potentials 105

5.3. Improving access to inclusive and quality services in education, training and lifelong learning 106
5.3.1. The challenge 106
5.3.2. Policy needs and potentials 111

5.4. Increasing the Socioeconomic Integration of marginalised and disadvanted groups 112
5.4.1. The challenge 112
5.4.2. Policy needs and potentials 116

5.5. Ensuring equal access to health 117
5.5.1. The challenge 117
5.5.2. Policy needs and potentials 121

6. A Europe closer to citizens (PO5) *123*

6.1. Introduction 123

6.2. Integrated social, economic, environmental and cultural development: multidimensionality 123
6.2.1. The challenge 123
6.2.2. Policy needs and potentials 130
6.3. Perceptions of EU legitimacy 133
6.3.1. The challenge 133
6.3.2. Policy needs and potentials 139
7. A better cooperation governance (SO1) 142
7.1. Introduction 142
7.2. Institutional and stakeholder capacity to participate in and benefit from territorial programmes and strategies 143
7.2.1. The challenge 144
7.2.2. Policy needs and potentials 145
7.3. The state of the civil society and its contribution to democracy 147
7.3.1. The challenge 147
7.3.2. Policy needs and potentials 149
7.4. Coordination and cooperation with other territorial programmes and the EU macro-regional strategies 150
7.4.1. The challenge 152
7.4.2. Policy needs and potentials 153
8. References 158

List of figures

Figure 1: Regional GDP per capita, 2017, NUTS-3 regions in % of the EU average 9
Figure 2: Interreg 2021+ NUTS-2 regions 10
Figure 3: Population distribution in Central Europe, 2019 11
Figure 4: Central Europe cities: left graph: cities with more than 250 thousand inhabitants; right graph cities between 100 and 250 thousand inhabitants 12
Figure 5: Share of population living in urban, intermediate and rural regions, 2019 13
Figure 6: Distribution of the Central Europe area (left graph) and GDP 2018 (right graph) 14
Figure 7: Share of sectors in total gross value added, 2016 15
Figure 8: Intramural R&D expenditure, total economy 2016, in % of GDP 19
Figure 9: Intramural R&D expenditure, total economy 2017 by firm size, in % of GDP 20
Figure 10: PCT patent applications, normalised score (RIS 2020) 21
Figure 11: Patent applications to the EPO 2014, per billion euro of business enterprise expenditure on R&D 21
Figure 12: EU community design applications 2017, numbers per 1 mio. inhabitants 22
Figure 13: “Public support to train staff” has positive impact on company’s success to commercialise innovative goods and services, 2016, by firm size and country 23
Figure 14: Index on the online activities of citizens, 2020 27
Figure 15: Index on the integration of digital technology into the business sphere 28
Figure 16: Enterprises whose business processes are automatically linked to those of their suppliers and/or customers, 2017 – Large enterprises (left graph) and SMEs (right graph); percent of enterprises in the respective size class 29
Figure 17: Index on digital public services 30
Figure 18: Online interactions with public authorities, percent of internet users, 2019 30
Figure 19: Share of SMEs in total country employment, 2016 32
Figure 20: NUTS-3 productivity in manufacturing (left graph) and knowledge intensive services (right graph), 2017 34
Figure 21: Productivity* in industry (left) and knowledge intensive services (right), 2017 by degree of urbanisation, percent difference to the national average 35
Figure 22: Contribution to total employment growth, 2013-2016; by size class of enterprises - contribution to the total economy employment growth rate (annual average) 36
Figure 23: Share of population with completed tertiary education, 2019 (left); share of population with completed secondary education, 2019 (right) 39
Figure 24: Share of population with completed tertiary education, 2019; by degree of urbanisation: cities (left graph), towns and suburbs (middle graph) and rural areas (right graph) 40
Figure 25: Share of population with completed secondary education, 2019; by degree of urbanisation: cities (left graph), towns and suburbs (middle graph) and rural areas (right graph) 40
Figure 26: Informal Learning 2016, in % of Total Population by degree of urbanisation 41
Figure 27: Individuals who have never used a Computer 2018, in % of Total Population 42
Figure 28: Individuals who have never used a computer 2018, in % of total population, by urbanisation degrees 43
Figure 29: Individuals who have never used a computer 2017, in % of population aged 25-34 44
Figure 30: Final energy consumption per m2 in the residential sector, at normal climate, 2005 and 2018, in kg of oil equivalents / m^2 48
Figure 31: Greenhouse gas emissions in CE and EU-28 during 1990-2018, in % 49
Figure 32: Share of renewable energy in gross final energy consumption in CE and EU-28, in % 51

Figure 33: Electricity generated from hard coal and lignite, 2015 51
Figure 34: Electricity generated from renewable sources, 2015 52
Figure 35: Number of smart grids R & D and demonstration projects in the EU 54
Figure 36: Total investment (million EUR) in smart grid projects per country 55
Figure 37: Area of concern - extreme weather events in 2018 (left). Precipitation deviation during summer 2018 compared to period 1981-2010 (right).....57
Figure 38: Water exploitation index plus, 2015 60
Figure 39: Recycling rate of municipal waste, 2012 and 2018, % of total waste generated.....64
Figure 40: Common farmland bird index, 2008 = 100 69
Figure 41: Annual average particulate matter concentration, 2015.....70
Figure 42: Means of transport primarily used to go to work/training place, 2015, in %, ...74
Figure 43: Purchases via internet in total and from other EU countries, 2019 78
Figure 44: Internet access in households by degree of urbanisation, 2019, in % of total households 79
Figure 45: Differences in the frequency of internet access and online banking activities persist.....80
Figure 46: Dimensions of the Digital Economy and Society Index, 2019 81
Figure 47: State of motorway infrastructure density, 2018.....84
Figure 48: Expected time savings in travel time by rail resulting from TEN-T investments.....85
Figure 49: Greenhouse gas emissions by sector for the EU-28 - Shares based on million tonnes CO2 equivalents.....88
Figure 50: Greenhouse gas emissions attributable to the transport sector (million ton of CO2 equivalent) and its share in total emissions (in %).....89
Figure 51: Modal split of freight transport in 2018 and change since 2010 by country.....89
Figure 52: Air transport of goods and passengers 91
Figure 53: Commuters to foreign countries.....93
Figure 54: EU regional social progress index 2016, in %.....98
Figure 55: Long-term unemployment rate 2019, in % of active population 100
Figure 56: Youth unemployment rate 2019, in % of active population aged 15-24 101
Figure 57: Youth unemployment rates 2019, in % of active population aged 15-24 by urbanisation degrees 102
Figure 58: Part-time employment 2019, in % of total employment.....103
Figure 59: Involuntary part-time employment 2019, in % of total part-rime employment 104
Figure 60: Involuntary temporary employment 2019, in % of total temporary employment.....104
Figure 61: Participation in education and training 2019, in % of population aged 25-64.....108
Figure 62: Participation rate in education and training 2019, in % of population aged 25-64 by Urbanisation Degrees 108
Figure 63: Participation in early childhood education 2018, in % of between 4-years and starting age of compulsory education.....109
Figure 64: Early leavers from education and training 2019, in % of total population aged 18-24.....110
Figure 65: Early leavers from education and training 2019, in % of population aged 18-24 by urbanisation degrees.....111
Figure 66: At risk of poverty or social exclusion 2017/2019, in % of total population.....113
Figure 67: At risk of poverty or social exclusion 2018/2019, in % of total population by urbanisation degrees 114
Figure 68: Young people not in employment, education or training 2019, in % of population aged 15-24.....115
Figure 69: Young people not in employment, education or training 2018/2019, in % of population aged 15-24 by urbanisation degrees.....116
Figure 70: Medical doctors 2018, per hundred thousand inhabitants.....118

Figure 71: Long-term care beds in nursing and residential care facilities 2015, per hundred thousand inhabitants 119
Figure 72: Self-reported use of home care services 2014, in % of total population by urbanisation degree ...120
Figure 73: Self-reported unmet needs for medical examination due to 'too expensive or too far to travel or waiting list' 2018, in % of population aged 16 and above 121
Figure 74: Average yearly net migration rate (left graph) and average yearly rate of natural population change (right graph) 2016 – 2019 in % of the total average population 2016 – 2019 125
Figure 75: Average long-term unemployment rate 2016-2018 as % of average total unemployment 2016-2019 127
Figure 76: 2030 projected old age dependency ratio (EUROPOP 2008)....128
Figure 77: Proportion of people who agree that it is easy to find good housing at a reasonable price in their city in %, 2015[1] 129
Figure 78: Nights spent at tourist accommodation establishments 2017, per thousand inhabitants 130
Figure 79: Average response scores: EU citizenship and People in the EU have a lot in common....135
Figure 80: Average response scores: Trust in EU and satisfaction with EU democracy....136
Figure 81: Turnout in European Parliament election and percentage of people that tend to trust the EU 137
Figure 82: Average response scores: things in the EU are going in the right direction and EU image 138
Figure 83: Respondents in Interreg CENTRAL EUROPE countries answers to the following question: "From the following political representatives, which ones are best placed to explain you how European policies impact your day-to-day life?"....140
Figure 84: Maps: participation[1] (left) and expenditure[2] (right) index - Interreg CENTRAL EUROPE 2014-2020 projects, NUTS-2 regions. 145
Figure 85: Democracy Index 2019....148
Figure 86: Political participation (left graph) and Civil liberties (right graph) indices, 2019 149

List of tables

Table 1: TEN-T corridors by central Europe country....82
Table 2: Eight potentially most beneficial projects in central Europe with high need for improvement of cross-border passenger services 87
Table 3: Road fatalities in central Europe in 2017 92
Table 4: National funding programmes for combined transport 94
Table 5: Interreg TNC and CBC programmes overlapping with the Interreg CE Programme, number of projects by programme and investment priority....154
Table 6: List of EGTC programmes in Central Europe 157

1. INTRODUCTION

This report is one input to the strategy building process of the Interreg CENTRAL EUROPE 2021-2027 Programme. For this, it identifies the main joint challenges and needs of the central European area as well as strategic relevant fields of actions for transnational cooperation with the potential to overcome territorial disparities, taking into account economic, social, and environmental as well as other relevant aspects. By taking a scientific data and knowledge driven approach, it provides the evidence base for a fact-based decision-making process of the national committees in the programme Member States, deciding on the selection of Policy Objectives and Specific Objectives of the Interreg CENTRAL EUROPE 2021-2027 programme.

To facilitate the decision-making process this report is structures according to European Regional Development Fund (ERDF) Policy Objectives for the period 2021-2027, as defined by the recent Council position (from 15.7.2019). Thus, the report is structured along the five ERDF Policy Objectives and the one Interreg Specific Objective, i.e.:

1. A smarter Europe (PO1);
2. A greener, low-carbon and resilient Europe (PO2);
3. A more connected Europe (PO3);
4. A more social Europe (PO4);
5. A Europe closer to citizens (PO5);
6. A better cooperation governance (Interreg specific objective).

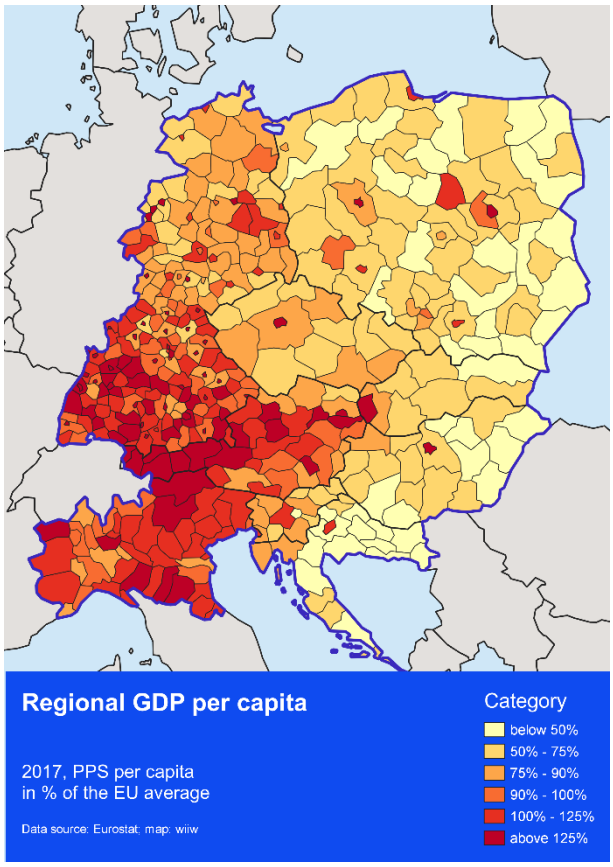
Each of these chapters is further divided according to the respective Specific Objectives of each Policy Objective. Each chapter covers the main challenges for each Policy Objective, the resulting needs for policy intervention as well as the transnational cooperation's potential to address those challenges.

Before analysing the specific challenges, needs and potentials, it is useful to remind of the main challenge and policy need for central Europe. It is the need to reduce economic, social, territorial and also environmental disparities within its area and with respect to the EU. Three decades after the start of transition disparities are still too high in central Europe. This is illustrated in Figure 1, showing the NUTS-3 regional differences in GDP per capita. What is more, disparities are not exclusively found between countries, rather economic and social gaps are wide and widening within countries between urban and rural regions.

The economic divide thereby directly affects the social divide, as with lower incomes the social situation worsens, and threatens territorial cohesion as certain types of regions prosper while other regions decline. In the end this may also have repercussions on the political cohesion and social fabric within and across central Europe countries.

On its own, transnational cooperation cannot tackle these challenges and reduce those disparities. Yet, it can make contributions to the cohesion process that no other European programme can easily do. By bringing together people from different side of the borders, exchanging best practices or building of capacities the joint development of strategies, pilot actions or cooperation tools, the programme disseminates and creates knowledge. And, unequivocally, knowledge is one of the key drivers for economic, social and territorial development.

Figure 1: Regional GDP per capita, 2017, NUTS-3 regions in % of the EU average



Source: Eurostat, map: wiiw

This report is intended as an input to the process of defining how this contribution of the Interreg CENTRAL EUROPE Programme to cohesion will look like in the future.

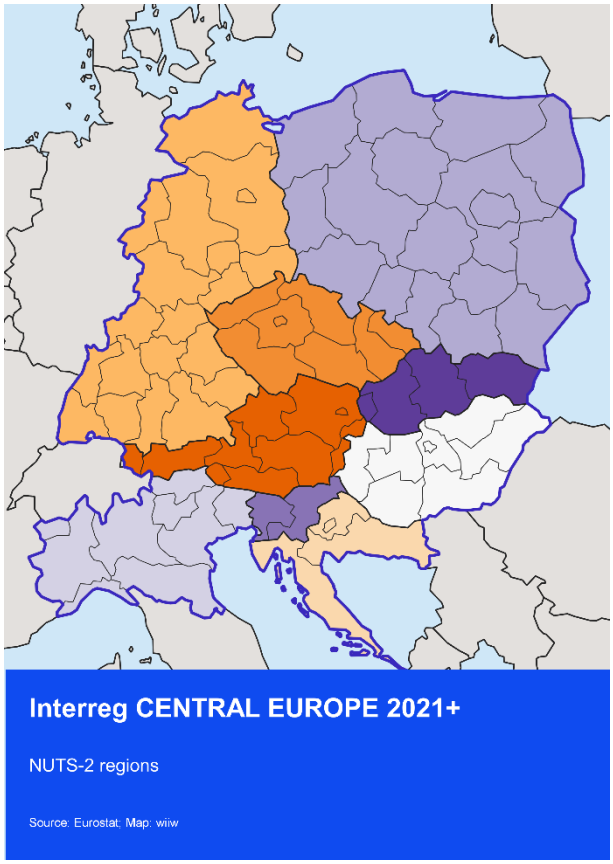
1.1. UPDATE OCTOBER 2020

This report is an update of the report published in February 2020. It was done to get the latest available data into the report, to add more information regarding some basic characteristics of the Interreg CENTRAL EUROPE 2021+ programme area as well as further information on central European cooperation structures. Importantly, the 2021+ programme area will be enlarged by the German Braunschweig region. To take account of this, the update adds this region to the analysis. Also, the update briefly reflects on the impact of the COVID-19 pandemic, though for this a special paper has been written in the context of the “Analysis of the main territorial challenges, needs and transnational cooperation potentials in central Europe”. Both, the reflection on the pandemic and the basic characteristics, are part of this introduction. The additional information on cooperation structures is put in chapter 7.4.

1.1.1. Central Europe 2021+ characteristics

Central Europe covers 9 countries, seven of them fully including Austria, Croatia, the Czech Republic, Hungary, Poland, Slovakia and Slovenia, and two partly, namely Germany and Italy. Germany participates with the Bundesländer Baden-Württemberg, Bayern, Berlin, Brandenburg, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt und Thüringen as well as the Braunschweig region in Niedersachsen. Italy participates with 9 regions, i.e. Piemonte, Valle d'Aosta, Liguria, Lombardia, the autonomous provinces of Bolzano/Bozen and Trento, Veneto, Friuli-Venezia Giulia and Emilia-Romagna (see Figure 2).

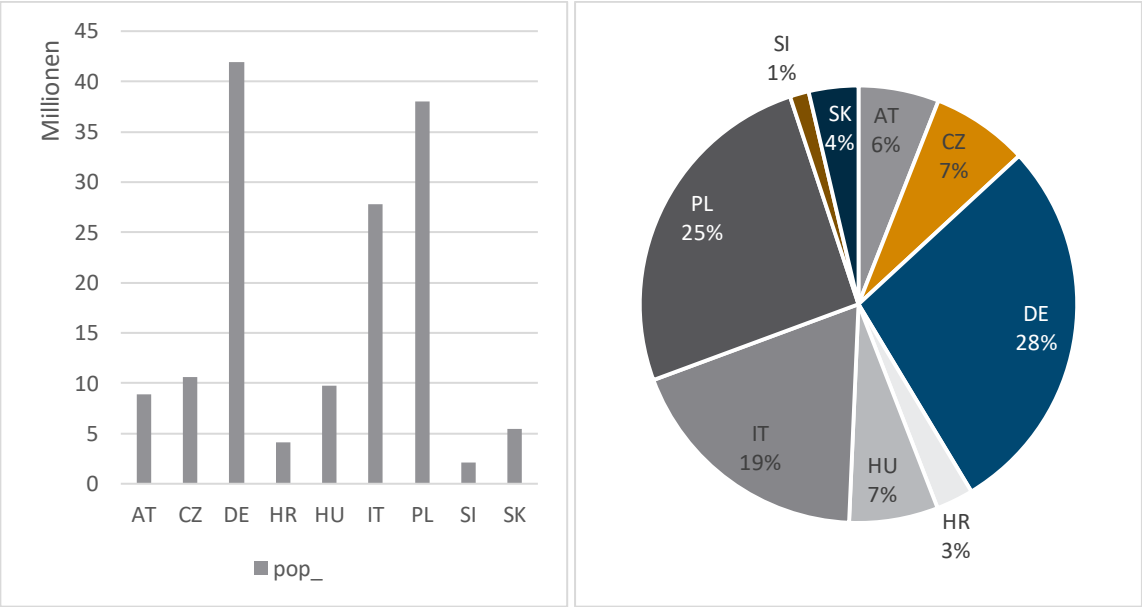
Figure 2: Interreg 2021+ NUTS-2 regions



Source: Eurostat; Map: wiiw

In total, Central Europe includes 81 NUTS-2 regions (according NUTS 2021 classification) with around 148.5 million inhabitants in 2019. This corresponds to one third of the EU population. In terms of population, the biggest partner in Central Europe is Germany with around 42 million inhabitants; this corresponds to 28% of the total Central Europe population. It is followed by Poland (38 mn. inhabitants, 25% of total) and Italy (27.7 mn. inhabitants, 19% of the total). The other 6 central European countries are comparatively smaller. Their population ranges from 2 million (Slovenia) to 10.6 million (Czech Republic); this corresponds to 1% to 7% of the total Central Europe inhabitants (Figure 3).

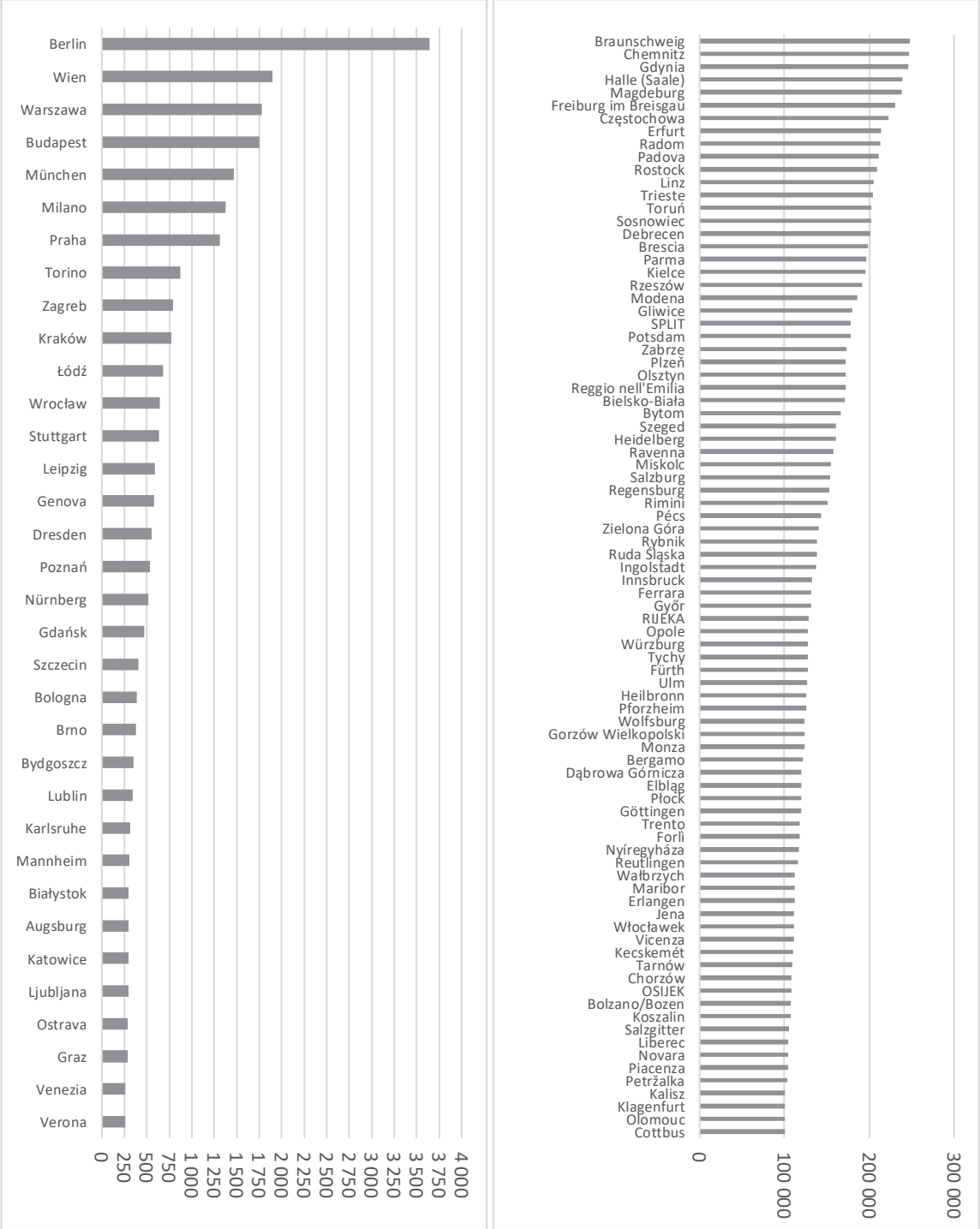
Figure 3: Population distribution in Central Europe, 2019



Source: Eurostat

Central Europe has 120 cities with more than 100 thousand inhabitants, of which Cottbus is the smallest (100,219 inhabitants in 2019) and Berlin is the biggest (more than 3.6 million inhabitants). Also, Central Europe has seven cities with more than 1 million inhabitants, besides Berlin they are: Praha, Milano, München, Budapest, Warszawa, and Wien (see Figure 4).

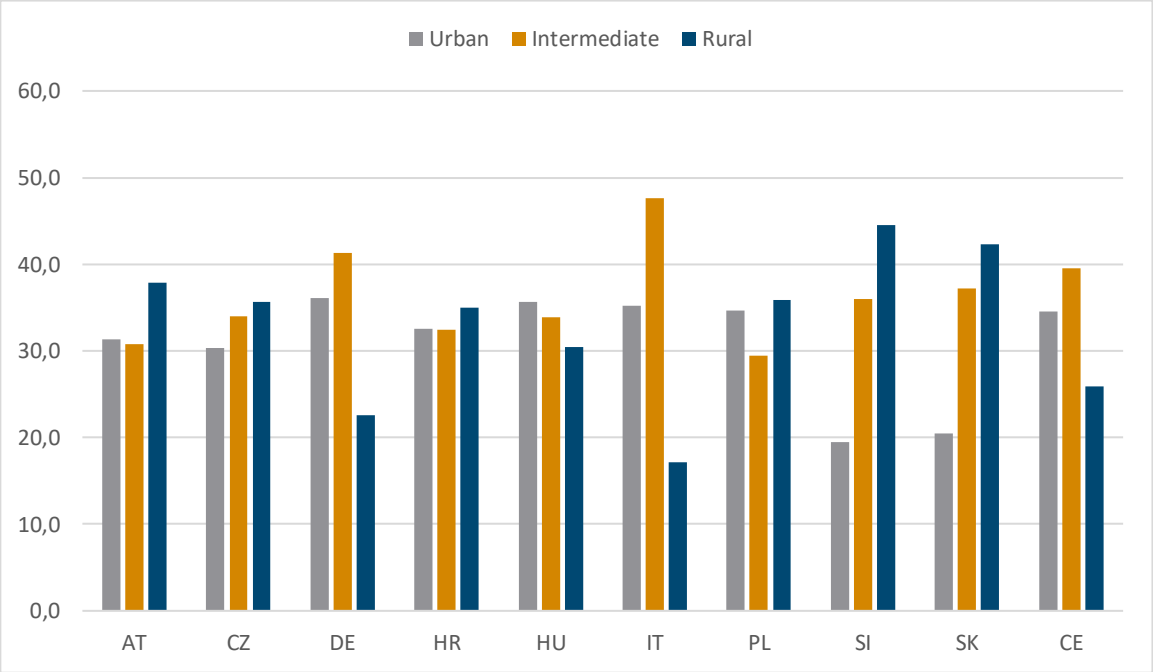
Figure 4: Central Europe cities: left graph: cities with more than 250 thousand inhabitants; right graph cities between 100 and 250 thousand inhabitants



Source Eurostat

Despite the large number of big cities, the population is fairly evenly distributed across urban and rural regions in Central Europe. Hence, around one third of the Central Europe population lives in bigger cities, 37% in intermediate regions, and 30% in rural areas (see Figure 5). There are however differences across central European countries. Italy and Germany are the most urbanised areas in Central Europe as only 17 and 23% of the population live in rural areas. By contrast, Austria, Slovakia and Slovenia are the most rural countries. There the share of population living in rural areas ranges between 37% and 45%.

Figure 5: Share of population living in urban, intermediate and rural regions, 2019

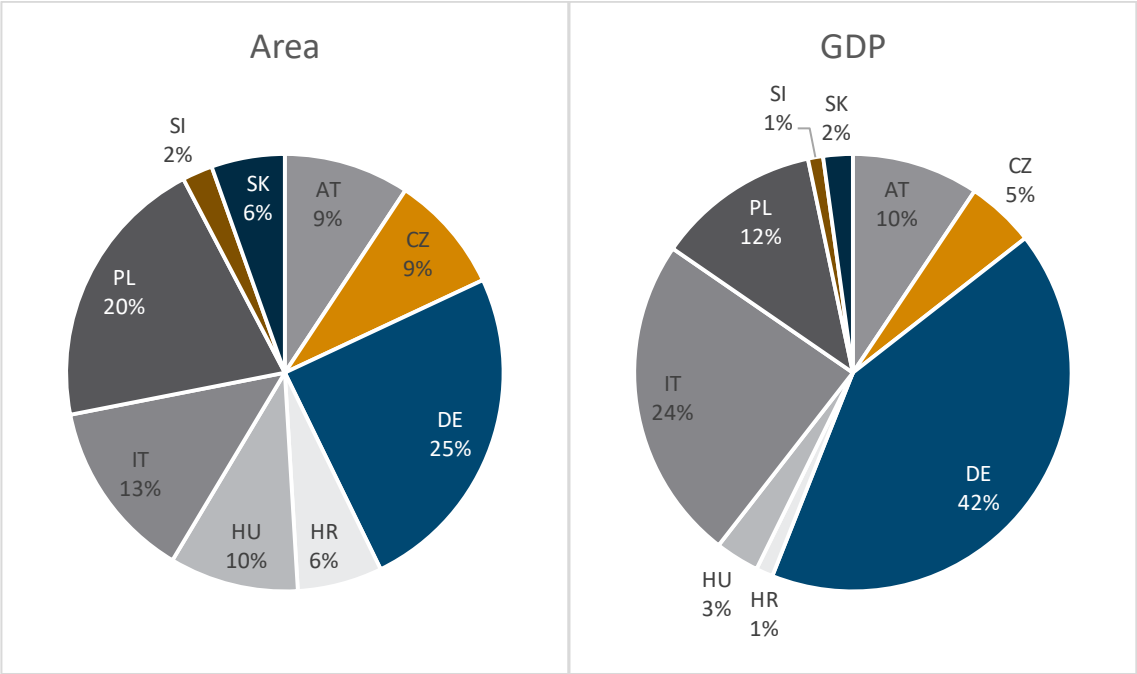


Source: Eurostat

The Central Europe area covers over 900 thousand square kilometres. This is approximately 25% of the EU's area. The biggest country in Central Europe in terms of size is Germany, which covers one quarter of Central Europe. Poland covers 20%, Italy 13% and Hungary 10%. The smallest countries are Slovenia, Croatia and Slovakia. They cover between 2% to 6% of the Central Europe area (see Figure 6, left graph).

In 2018, Central Europe's GDP was around 4 trillion Euro. This is approximately 30% of the EU's total GDP. Within Central Europe the Germany has the biggest share in the area's GDP, i.e. around 42%. It is followed by Italy with a share of 24%, Poland (12%) and Austria (10%). The share of the other countries in the GDP of Central Europe varies between 1% to 5% (see Figure 6, right graph).

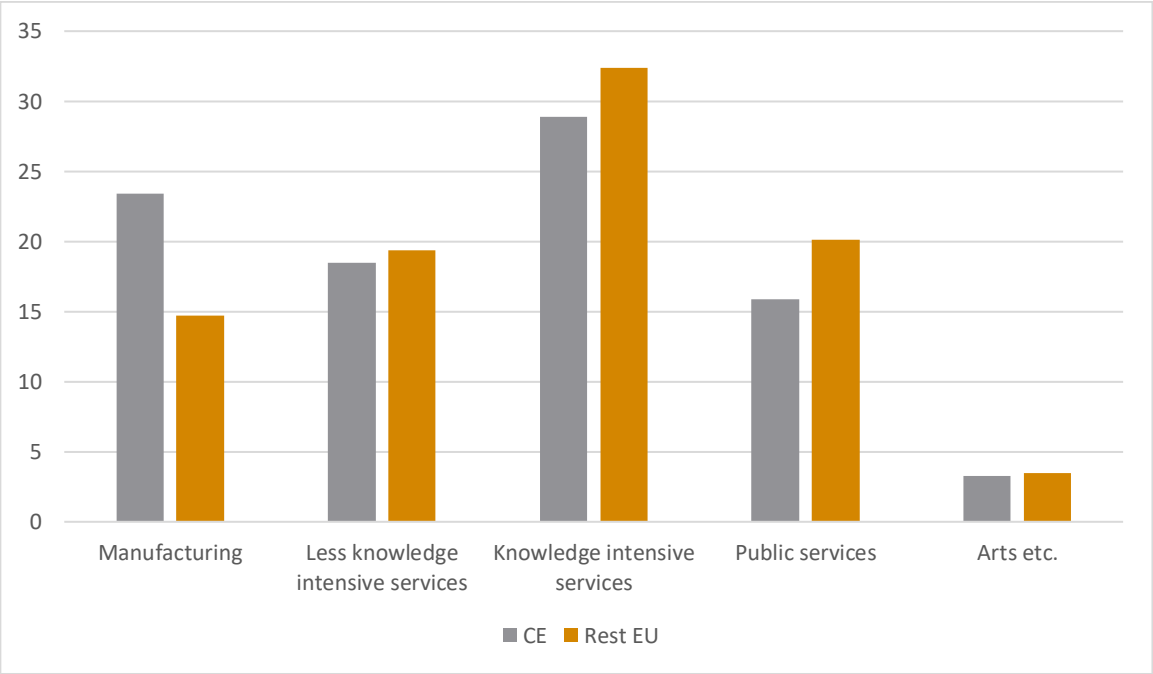
Figure 6: Distribution of the Central Europe area (left graph) and GDP 2018 (right graph)



Source: Eurostat

Central Europe's structure is much more geared towards manufacturing industry than other European areas. Thus, manufacturing industry's share in total gross value added is around 23%, compared to ca. 15% in the remaining EU regions (see Figure 7). Also, while Central Europe produces 30% of total EU GDP it produces 40% of total EU manufacturing gross value added. Economically, the biggest contributors to GDP is the services sector, in particular the knowledge intensive services. They contribute around 29% to Central Europe's total gross value added. However, this share is lower than in the Rest-EU, where it is around 32%. Less knowledge intensive services contribute 18.5% to total gross value added (19.4% in the Rest-EU), public services 16% (20% Rest-EU), arts and other services ca. 3% (the same in the Rest-EU)

Figure 7: Share of sectors in total gross value added, 2016



Source Eurostat, wiiw calculation
Note: 2016 data was used because for French regions no newer data were available

1.1.2. Reflections on the COVID-19 pandemic

The outbreak of the COVID-19 pandemic was a major shock to Central Europe. The economy declined strongly in all nine countries, particularly in Italy and Croatia, where GDP is expected will decline by more than 10% in 2020. Unemployment was increasing everywhere, although at least at the beginning of the pandemic most labour-shedding was avoided through a reduction of working hours. In many cases, people started to work from home, particularly in Austria, Germany and Italy, while in Hungary or Croatia or Slovakia a smaller share of the population took this option. The extent to which this “home-office” was applied depended amongst other determinant also on the digital connectivity, which is still very different in Central Europe.

The COVID-19 induced lock-downs had devastating effects on tourism, with tourism nights spent in Central Europe dropping between 80% and 95% depending on the country and regions. Strongly hit regions included the coastal regions in the South and North of Central Europe as well as the Alpine regions, all of which are heavily economically depending on tourism. Only after the lock-downs ended tourism recovered slightly. At least the lockdowns gave a short break to the environment as trade and transport flows more or less stopped.

The COVID-19 consequences for Central Europe are still as much unclear as high the uncertainty regarding the future development of the pandemic is. If it is a temporary phenomenon and everything goes back to “normal” in 2021, much of the challenges mentioned below will not change. If it is longer lasting, all of the challenges below will still be the same. Yet they will be overshadowed by the pandemic and its economic and social effects. Particularly for Central Europe, its effect on the functional relationships and co-operations in the public and private sphere will be detrimental as the pandemic has shown how quickly the countries turn to

national solutions when facing a global crisis, thereby interrupting the flow of people, goods and services across borders.

It seems natural to argue for a coordinated approach across European countries in general and Interreg CE countries to address the challenges of the “borderless” pandemic. COVID-19 has shown that such concepts are highly necessary, yet still largely missing. The Central Europe programme will only receive a small share of the 2021-2027 Multiannual Financial Framework. Nevertheless, with its tools and through supporting cooperation across countries it can contribute to this rebuilding process[1].

[1] See: wiiw, 2020, Covid-19 effects on Central Europe for a more detailed analysis of the COVID-19 effects on Central Europe.

2. A SMARTER EUROPE (PO1)

2.1. INTRODUCTION

The fourth industrial revolution has triggered a period of transition towards a digitised economy with advanced technology that requires a skilled workforce. The combination of the fast pace of technological progress and fierce global competition due to globalization implies that governments, firms and individuals have to adapt with an increasingly fast pace in order to harness the potential benefits and not fall behind global competitors.

The European Commission's first cohesion policy objective to create a 'smarter Europe' should be based on an innovative and smart transition of the EU's economies. In order to structure this broad objective, the EC has suggested four sub-objectives:

- Enhancing research and innovation capacities and the uptake of advanced technologies
- Reaping the benefits of digitisation for citizens, companies and governments
- Enhancing growth and competitiveness of SMEs, including by productive investments
- Developing skills for smart specialisation, industrial transition and entrepreneurship

This section is aligned to the proposed objectives and therefore, covers the four main areas identified a) research and innovation; b) digitisation; c) SME competitiveness; and d) skills.

2.2. ENHANCING RESEARCH AND INNOVATION CAPACITIES AND THE UPTAKE OF ADVANCED TECHNOLOGIES

The development of new technologies through research and innovation and the adoption of existing technologies are among the main drivers of firms' productivity and competitiveness and thus, crucially determine the growth trajectory of regions (JRC 2017). The central Europe region, but the EU more generally has observed a slowdown in productivity growth after, but already partly prior to the financial crisis. The JRC argues that this observed slack in productivity development can be attributed to a great extent to slow rates of technological progress.

The slowdown is not only in absolute terms, but also relative to other main economies. Based on many innovation indicators, the EU is lagging behind in innovation and research inputs and outputs compared to frontrunners such as the United States, Japan and South Korea[2]. Thus, in order to close this gap, the EC initiated the Innovation Union under its 2020 strategy. The main objectives include removing obstacles to innovation and change interactions between public and private companies, EU, national and regional institutions.

[2] https://ec.europa.eu/info/sites/info/files/rec-17-015-srip-report2018_mep-web-20180228.pdf

In addition to legislative efforts, the EU has initiated several programmes to boost its 2020 strategy for 'smart, sustainable and inclusive growth'. Among others, the EC set the goal to invest 3% of GDP in R&D in order to catch up with leading innovators such as Japan and the US who spend 3.3% and 2.8% of GDP respectively[3]. The flagship instrument under the 2014-2020 Multiannual Financial Framework (MFF) is Horizon 2020 which is a financial tool to fund research in the EU. Over the period, it can allocate EUR 72.4 bn to research projects and institutions. The annual budget of around EUR 10 bn accounts for around 3% of total EU R&D expenditure.

Furthermore, the European Structural and Investment Funds (ESIF) financially support the EU's set objectives. According to data from the EC[4], within the ESIF EUR 67 bn are allocated towards Research and Innovation. Most resources, namely 94% stem from the European Regional Development Fund (ERDF) while the remaining 6% are financed through the European Agricultural Fund for Rural Development (EAFRD)

Financing innovation is also an important activity of the European Investment Bank, and the European Fund for Strategic Investments (EFSI) provides important financial guarantees (e.g. to small and medium-sized enterprises (SMEs)).Other EU initiatives include the education programme Erasmus+, European Cooperation in Science and Technology (COST) for scientific networking and the European Science Foundation (ESF) which funds workshops, networking programmes, conferences and collaborative research. Additionally, funding for SMEs is available through COSME.

2.2.1. The challenges

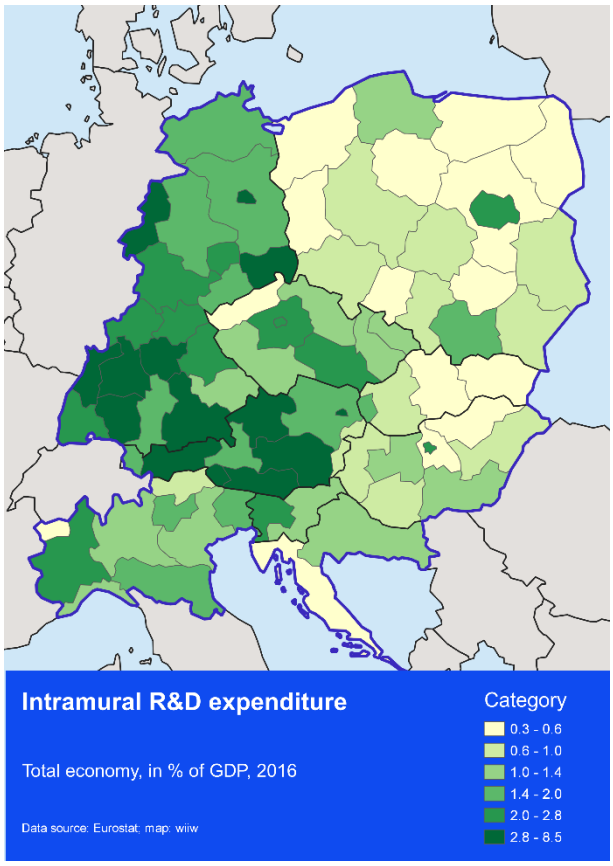
Research and innovation have been identified as key source for economic development and the creation of new and better jobs. The importance of research in central Europe firms varies significantly across countries and within countries. Challenges in the innovation process occur at different levels. First, firms devote different amount of resources towards R&D. Second, some firms are better in transforming such research inputs into outputs such as patents. Thus, as suggested by Edquist and Zabala-Iturriagagoitia (2015), output should be analysed and measured separately to properly measure innovation. And third, transforming new innovations into viable and marketable products is a key challenge for many firms. As many researchers argue, the key weakness in the EU is not necessarily the creation of ideas, but the failure to commercialise innovations at the global market.[5]

Thus, the first dimension how research and innovation can be analysed is along the chronological stages of the process. To get a more holistic picture of the challenges which regions face in order to embark on or continue an 'innovative and smart transformation', more facets need to be considered. First, global competition entails the necessity for firms to compare themselves both to other regions within the EU and to global competitors. Second, innovation processes tend to cluster spatially and thus, benefits from research and innovation are likely to be not distributed equally within a region. And third, even within areas where knowledge is agglomerating, small and large firms face different obstacles for innovation and its commercialisation.

[3] https://ec.europa.eu/eurostat/documents/2995521/9483597/9-10012019-AP-EN.pdf/856ce1d3-b8a8-4fa6-bf00-a8ded6dd1cc1
[4] https://cohesiondata.ec.europa.eu/themes/1
[5] For example, Veugelers (2017)

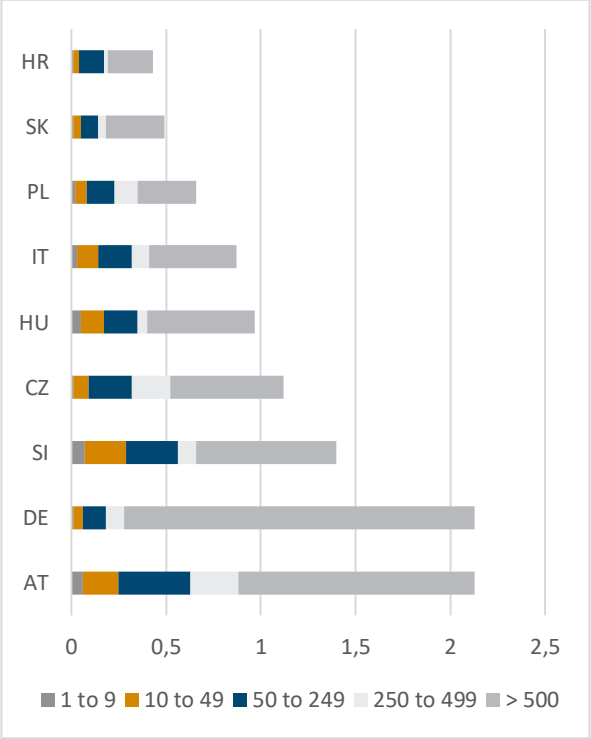
Thus, we start the analysis by identifying the territorial differences to what extent firms engage in R&D activity. R&D expenditure is often used as a proxy for the input to research processes. Figure 8 shows the territorial divide in R&D expenditure expressed as a share of GDP across countries and regions. As mentioned above, the EU's 2020 strategy objective was to lift average EU spending to the 3% benchmark. The figure indicates that only few regions located in Austria and Germany achieved this goal. R&D activity in the remaining countries is heavily concentrated in regions with a large share of population living in cities. In particular, the 'capital regions', that are regions where a country's capital is located, have the highest R&D expenditure relative to GDP. In all CE countries, the capital regions have the highest R&D expenditure as a share of GDP with the exception of Italy where Piedmont, which inhabits Turin, is the leading innovative region capitals (e.g. it is Turin for Italy).

Figure 8: Intramural R&D expenditure, total economy 2016, in % of GDP



Source: Eurostat; Map: wiiw

Figure 9: Intramural R&D expenditure, total economy 2017 by firm size, in % of GDP



Source: Eurostat

Since research generally requires high skilled workers, these activities tend to be concentrated in different regions who supply qualified staff. The spatial clustering, however, intensified even more in Poland, Czechia, Slovakia, Hungary and Croatia between 2011 and 2017 and has increased mostly in regions with a higher share of employment in urban areas. Economic literature has found that there is strong persistence in innovation activity indicating that it is difficult for firms and regions to kick-start such processes.[6]

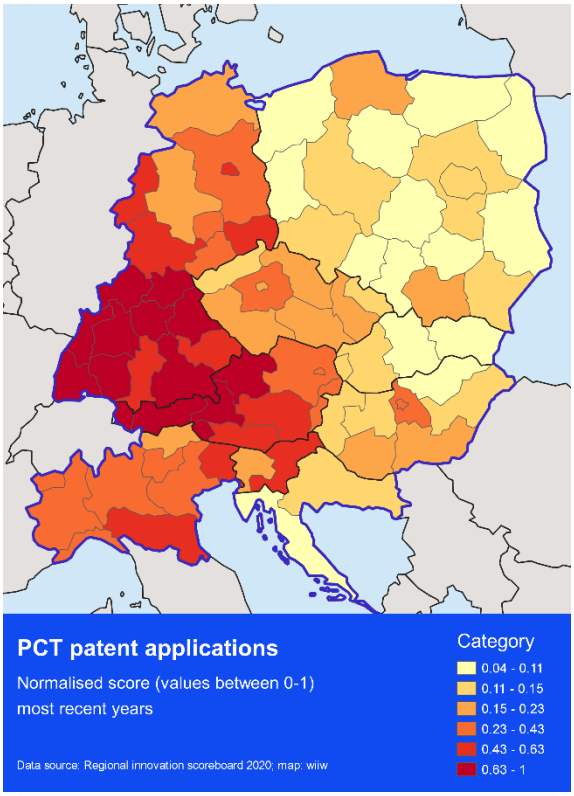
R&D expenditure is not only concentrated spatially but is also dominated by large companies. Although SMEs contribute to the largest share of employment, it is mainly companies with more than 500 employees who drive the country's R&D (Figure 9).

While input into the R&D process such as R&D expenditure is a good indicator for research and innovation activity, it is no guarantee that it directly translates into actual innovations. Therefore, in a second step we analyse patent data which is a good proxy for the output of R&D. Figure 11 indicates that the amount of patent applications as a ratio to R&D spending varies significantly across countries. This ratio is particularly low in Croatia and Czech Republic. However, it needs to be noted that this direct input-output relationship needs to be interpreted carefully, since there are many factors that determine patent applications such as different administrative costs or simply different norms in different economic sectors. Figure 10 shows that there is a strong correlation between those regions that invest in R&D and those who issue patents. The figure,

[6] Ganter and Hecker (2013), Veugelers (2017),

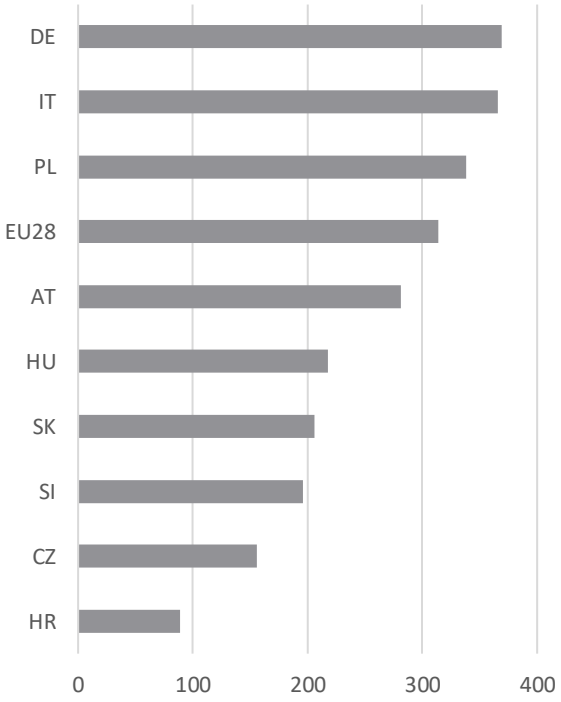
however, reveals that patents are somewhat less concentrated in capital regions as compared to R&D expenditure.

Figure 10: PCT patent applications, normalised score (RIS 2020)



Source: Regional Innovation Scoreboard (2020); Map: wiiw

Figure 11: Patent applications to the EPO 2014, per billion euro of business enterprise expenditure on R&D



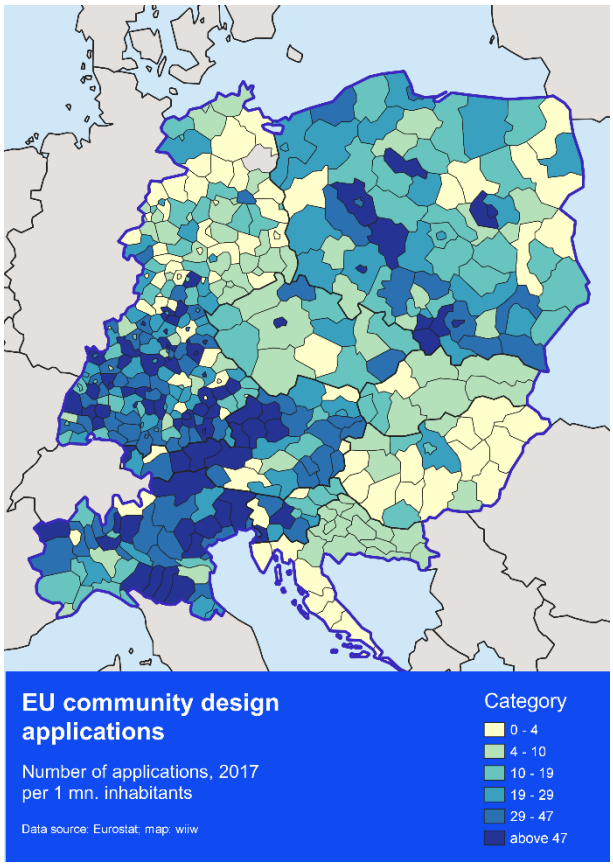
Source: Eurostat

The third challenge is related to the commercialisation of research outputs which is often considered as a major obstacle for companies in order to fully reap the benefits of innovation[7]. According to Innobarometer, the most pronounced obstacle related to the commercialisation of innovative goods and services are access to human resources, access to finance, cost or complexity of meeting regulations or standards and the dominance of established competitors. While the first two issues vary significantly across firms and countries, the latter two depend mostly on country-specific circumstances.

The community design applications, which firms seek in order to protect the outward appearance of a product or part of it, is one of the possible indicators that proxy efforts to commercialise products. Figure 12 shows the regional heterogeneity in the region. While the map again highlights that firms in North-Italy, West-Austria and South-Germany are among those who file the most applications, some regions in Poland and Slovenia show strong activities while the North-East of Germany and most regions in Hungary perform rather poorly.

[7] Veugelers (2017)

Figure 12: EU community design applications 2017, numbers per 1 mio. inhabitants



Note: Designs reflect a non-technological innovation and constitute means by which creators seek protection for their industrial property. A design is the outward appearance of a product or part of it, resulting from the lines, contours, colours, shape, texture, materials and/or its ornamentation.
Source: Eurostat; Map: wiiw

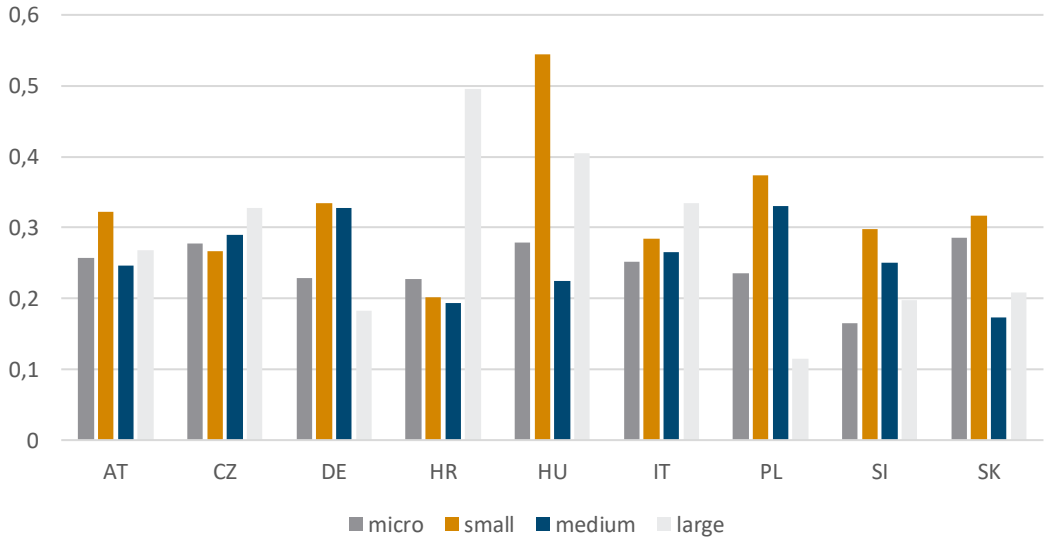
2.2.2. Policy needs and potentials

From a research and innovation perspective, the main challenges in central Europe encompass the concentration of R&D expenditure in urban regions and large companies, the varying returns to R&D investment and the lack of skilled workforce and access to finance in order to commercialise innovative goods. In this section, we point towards areas that require attention from policy makers in order to reduce the divide within the CE region and the gap to global frontrunners.

First, the role of networks between the different actors is considered to be particularly beneficial in research. Therefore, firms tend to cluster spatially in order to benefit from infrastructure, access to skilled work force and connections to different companies which could provide input or help to market innovations. However, there is also room for inter-regional collaboration. Taylor (2016) highlights that “domestic and international networks between firms as well as between firms, research performers and governmental actors are key to the generation and diffusion of innovations”. In particular, there is room for inter-regional collaboration through the organisation of conferences, trade fairs and exhibitions. Data from the Innobarometer reveals that particularly small firms would find such measures beneficial for the commercialisation of their goods. Large firms, in

contrast, demand support to access or reinforce presence in export markets. These two measures appeared to be particularly important for firms in Croatia, Hungary, Poland, Slovenia and Slovakia.

Figure 13: "Public support to train staff" has positive impact on company's success to commercialise innovative goods and services, 2016, by firm size and country



Source: Innobarometer (2016), wiiw calculations
Note: Question: Q6A Thinking about possible public support for commercialisation of your innovative goods or services, which of the following two types of intervention would have the most positive impact on your company? Support for: (MAX. 2 ANSWERS): Answer: Training staff in how to promote and market innovative goods or services; y-axis is average score based on all firms that innovated good or service since 2013 (if not considered as top 2 measure = 0; if considered as top 2 measure = 1)

The Innobarometer also reveals that firms expect public policies related to human capital to be most beneficial to commercialise innovative products. Figure 13 shows that firms across all sizes would welcome policies that help to train staff how to promote and innovate goods and services. Small- and medium-sized firms particularly favour such policies. Understanding what the 'right skills' are, is difficult. While there are obvious trends in demand for some general skills, such as digital competence, policy makers need to engage with companies in order to identify the lack of specific skills.

Regional Innovation Strategies for Smart Specialisation (RIS3) took centre stage in the EU's Europe 2020 strategy of smart, sustainable and inclusive growth and has the potential to facilitate more coordinated policies within regions, also in the development of skills. The smart specialisation approach brings together industrial, educational and innovation policies in order to identify and select a limited number of priority areas in which a region or country possess particular strengths. Once such strategies are identified, coordinated policies and knowledge-based investments need to be undertaken to implement them.[8]

In the 2014-2020 MFF period, RIS3 has become a central pillar for regional development and thus, the development of such strategies has been a prerequisite for receiving funding from the ERDF.[9] In practice,

[8] http://www.oecd.org/sti/inno/smartspecialisation.htm
[9] https://ec.europa.eu/jrc/en/research-topic/smart-specialisation

however, regional authorities and firms have been facing significant challenges in identifying, implementing and assessing innovation strategies. According to an intermediary assessment of RIS3 in the EU, the JRC finds that some regions struggle to identify investment priorities and often include a rather broad set of areas which does not meet the objective of specialisation. Furthermore, the report finds that calls for RIS3 projects are usually rather general and also include non-priority areas.[10]
In its Guide to RIS3, the European Commission (2012) also emphasises the role of "more strategic cross-border and trans-regional cooperation to achieve more critical potential and related variety". Although similar strategies in different regions are likely to spur competition between them, there is also great potential for collaboration. Cross-regional collaborations are particularly fruitful if companies participate in the same or similar value chains and thus, the common creation of knowledge and the diffusion of existing ideas can foster new innovative applications and integrated solutions.[11]

According to Veugelers (2017), governments should step up their efforts in order to promote innovation. Governmental actors, for example, could promote demand for innovation through public procurement. Such tools, for example, are more intensively used in the US where they have supported the development of advanced technologies.
Similarly, targeted EU interventions on some specific technologies could create research capacities for example, for key enabling technologies and new technologies. Such interventions could support the creation of infrastructure for prototyping and testbeds which would especially benefit SMEs. Furthermore, independent coordination bodies which can provide assistance and advice to simplify access to EU financing could boost innovation processes especially for universities and SMEs.[12]

A place-based approach, in particular for intermediate and rural areas is the provision of so called "innovation agents", specially educated and trained persons, who are able to support regions to firstly get aware of their already existing innovation potential, to establish networks within the region, with relevant partners outside the region and to get access to venture capital for the market oriented development of innovation ideas and prototypes.

Another important place-based approach is the inclusion of the local/regional cultural and creative sectors that are important drivers of innovation, promote local identity and crafts and act as catalysts for changes and innovation of products and processes in other sectors. With that, they are also main potential contributors to regional and local smart specialisation strategies.

Cultural and creative sectors drive innovation, acting as a catalyst for change in other sectors – and stimulate invention and progress across Europe's diverse cultural landscape. With the emergence of progressively complex, creative and intertwined business models, the cultural and creative sectors are increasingly becoming a decisive component of almost every product and service.

Furthermore, another place-based approach is the identification of hidden champions and the analysing and creating the framework conditions that are needed to support the formation and sustainability of such companies.

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[10] https://ec.europa.eu/jrc/sites/jrcsh/files/jrc116297.pdf
[11] https://ec.europa.eu/regional_policy/sources/docgener/presenta/smart_specialisation/smart_ris3_2012.pdf
[12] JRC (2017)

Due to the structure and budget of the Interreg CENTRAL EUROPE Programme, most value added in the field of research and innovation can be generated through pilot projects, the promotion of policy learning, policy sharing and the sharing of best practices. Past projects have embraced this unique role which is not covered by other major EU policies.13
The difficulty to diffuse the gained know-how and established instruments during projects to non-participants, however, remains. This is particularly true for SMEs who often lack networks. As described in the previous sections, SMEs engage in relatively little R&D activities, often due to the lack of access to skilled workforce, access to finance, access to proper infrastructure and network with other business and the public sector. Therefore, projects that aim at connecting SMEs across regions and providing advice on how to receive access to finance and alleviate the lack of skills are likely to have the biggest leverage.
The project 3DCENTRAL, for example, deals with the identification of smart engineering and rapid prototyping solutions provided by different SMEs or research institutions. While the project may find good practices, the promotion and distribution of the findings to other SMEs in the region could significantly boost the impact of the project.

2.3. REAPING THE BENEFITS OF DIGITISATION FOR CITIZENS, COMPANIES AND GOVERNMENTS

The digitisation of the business and society is one of the biggest changes to the global economic and social system since the industrial revolution. It brings about a high growth potential and opportunities for innovation and new jobs. Simultaneously it bears challenges like adapting to structural changes of both firms and the labour force, developing and/or adopting new technologies to stay competitive and seizing the innovative potential to be at the forefront of digital transformation. Consequently, in the period 2021-2027 the ERDF will support digitisation in three specific areas: a) the society, b) the economy and c) government.

Digitisation brings and will bring massive changes to the every-day lives of people, e.g. in health (e-health), education (e-learning), culture, leisure and sports (e-sports), communication, mobility (self-driving vehicles), interactions with the government (e-government) and shopping. Accordingly, the room for developing new products and services is large, but so are also the needs to develop new skills and getting acquainted to new processes and procedures.

As far as the economy is concerned, digitisation is considered to be in fact a new industrial revolution creating an Industry 4.0. It will merge the physical, biological and digital sphere by integrating cyber-physical systems[14], the Internet of Things[15], big data, cloud computing, robotics, artificial intelligence and additive manufacturing[16]. Digitisation will bring innovation to the products and services we produce and consume, the processes of their production as well as the underlying business models, re-shuffling the value chains and blurring boundaries between products and services[17].

Regarding government, digitisation and the increasing shift to e-government concepts will speed up administrative processes, improve the quality of the services and increase public sector efficiency. Digital

[13] http://fondi.europafacile.net/upload/Trans-Centro-Europa/Executive-summary_Studio-Innovazione.pdf
[14] Computers interacting directly with the physical world, e.g. computers that control the engine, braking and stability of a car and/or provide assistance to the driver.
[15] Interconnection via the internet with computing devices in everyday things, like e.g. fridges, heating, cars etc.
[16] 3D printing on an industrial scale.
[17] See EU Commission. (2016) Digitising European Industry - Reaping the full benefits of a Digital Single Market, COM(2016) 180 final, p.4.

public services will reduce the administrative burden on businesses and citizens and make interacting with public authorities more efficient and convenient.

In the following we provide an overview analysis on the status quo of digitalisation in the societal, business and government sphere in central Europe.

2.3.1. The challenges

The analysis of the state of digitisation in central Europe is based on the Digital Economy and Society Index (DESI)[18] and its underlying data as well as on Eurostat data. In many instances, data are available only at the country level, while regional data, if it exists, are highly aggregated and offers only limited conclusions, especially with respect to territorial differences. As unsatisfying as it is, the DESI data still provides some important conclusions for the central Europe countries.

The DESI itself is a composite index that summarising relevant indicators on Europe's digital performance and tracks the evolution of EU member states in digital competitiveness. For the analysis we refer inter alia to three specific sub-indices of the DESI that specifically cover a) the online activities of citizens, b) the integration of digital economy into the business sphere and c) digital public services.

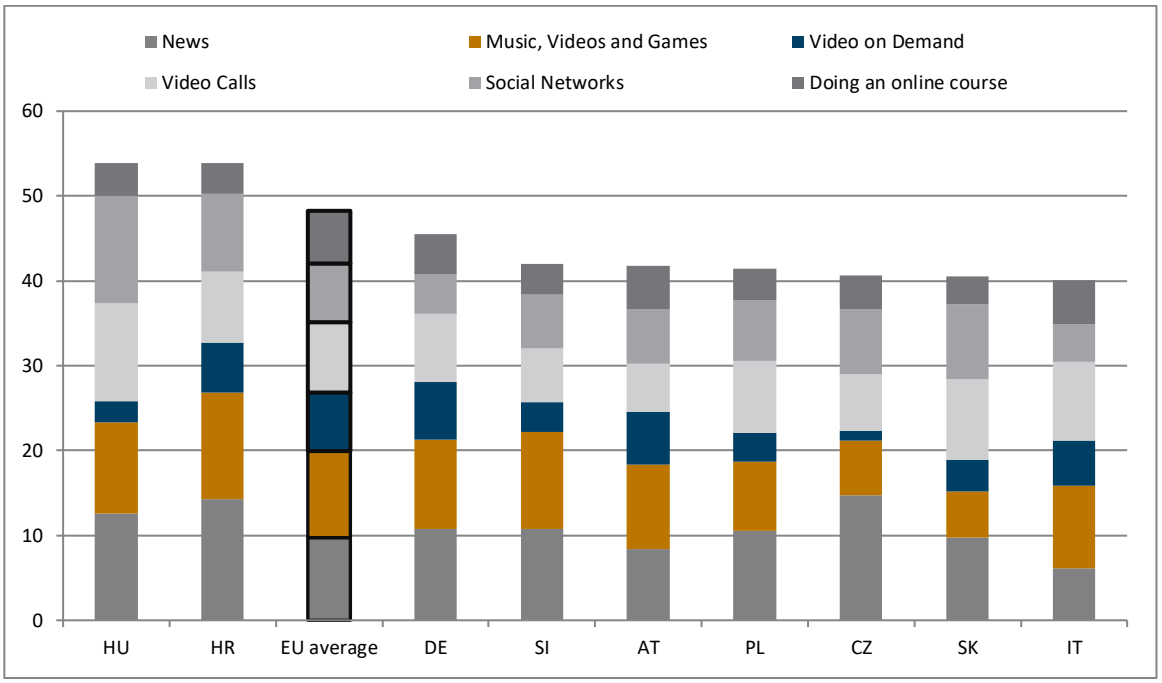
The overall story emerging from the DESI data is unfavourable for central Europe. That is, in most cases, central Europe countries perform below average in terms of digitalisation of the society, economy and the government.

To illustrate, Figure 14 shows the DESI for the online activities of citizens that is used as a proxy for the extent to which the people benefit from digitisation. This index is an aggregate of 8 sub-indices, covering the online consumption of a) news, b) music, videos and games, c) video on demand, d) video calls, e) social networks, f) professional social networks, g) doing an online course and h) online consultations and voting.

According to this index, in 2019 online activities are below the EU average in all central Europe countries, except Hungary and Croatia.

[18] https://ec.europa.eu/digital-single-market/en/desi

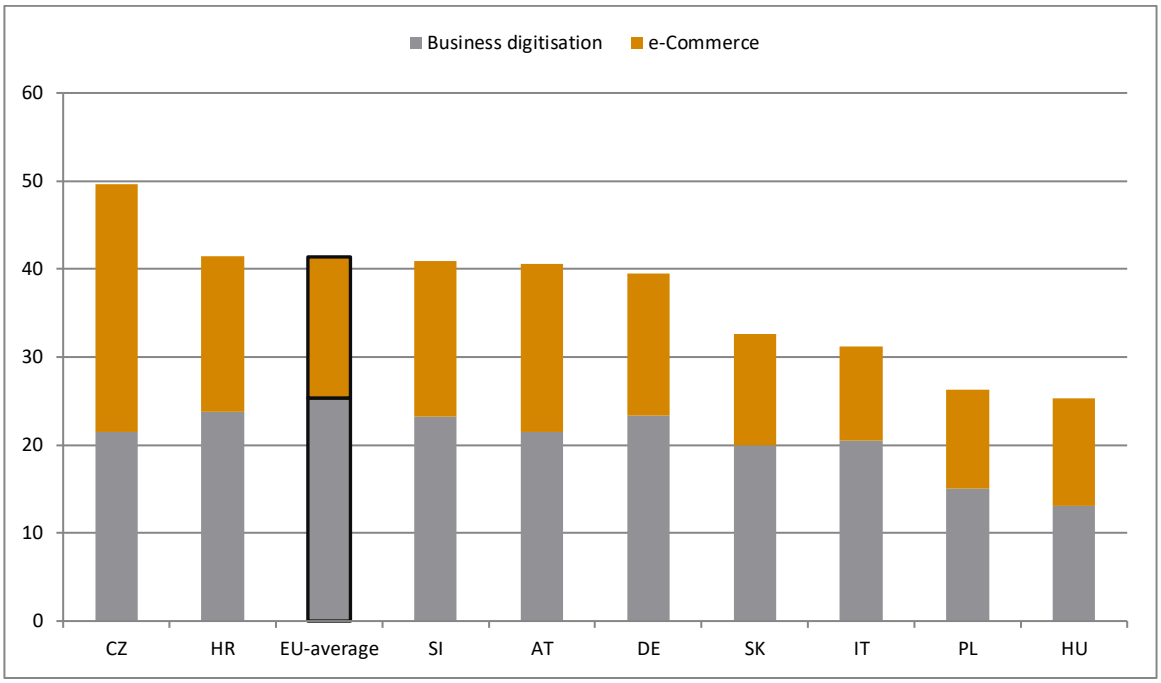
Figure 14: Index on the online activities of citizens, 2020



Source: EU Commission, DESI, https://digital-agenda-data.eu/datasets/desi/visualizations

The situation is similar in the business sphere as indicated by the index on the integration of digital technology into the business sphere (Figure 15). This index consists of two indicators, one for the level of business digitisation and the other for the development level of e-commerce. Similar to above, only two CE countries perform above the EU average, namely the Czech Republic and Croatia, while in all other central Europe countries the integration of digitisation in business is below the EU average.

Figure 15: Index on the integration of digital technology into the business sphere

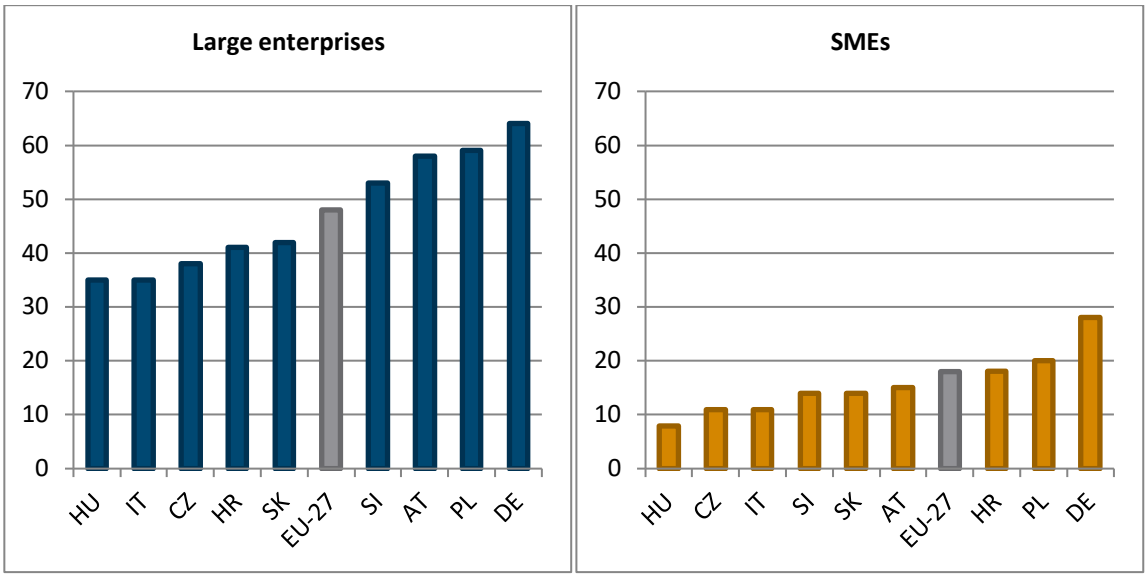


Source: EU Commission, DESI, https://digital-agenda-data.eu/datasets/desi/visualizations

This central European digital backwardness is in more detail shown by uptake of modern technologies by small and medium sized enterprises (SMEs). A number of statistics like enterprises using a) software solutions for customer relationship management, b) enterprise resource planning software, c) Radio Frequency identification (RFID) technologies, d) 3d printing and e) industrial and service robots point to the fact, that central European SMEs apply these technologies mostly at a lower rate than an average EU SME. This is illustrated by Figure 16 that shows the percent of enterprises whose business processes are automatically linked to those of their suppliers and/or customers (both for SMEs and large enterprises). It indicates that in most cases it is only German SMEs that have a clear above EU average uptake of modern technologies, while the SMEs in other central Europe countries perform around or below the EU average.

As far as large firms are concerned, the situation is more mixed, as in many instances large central Europe enterprises are amongst the leading users of digital technologies, while others are not too far from the EU average, though the need for digitally catching up might be a bitter higher for Hungarian large enterprises than for others.

Figure 16: Enterprises whose business processes are automatically linked to those of their suppliers and/or customers, 2017 – Large enterprises (left graph) and SMEs (right graph); percent of enterprises in the respective size class

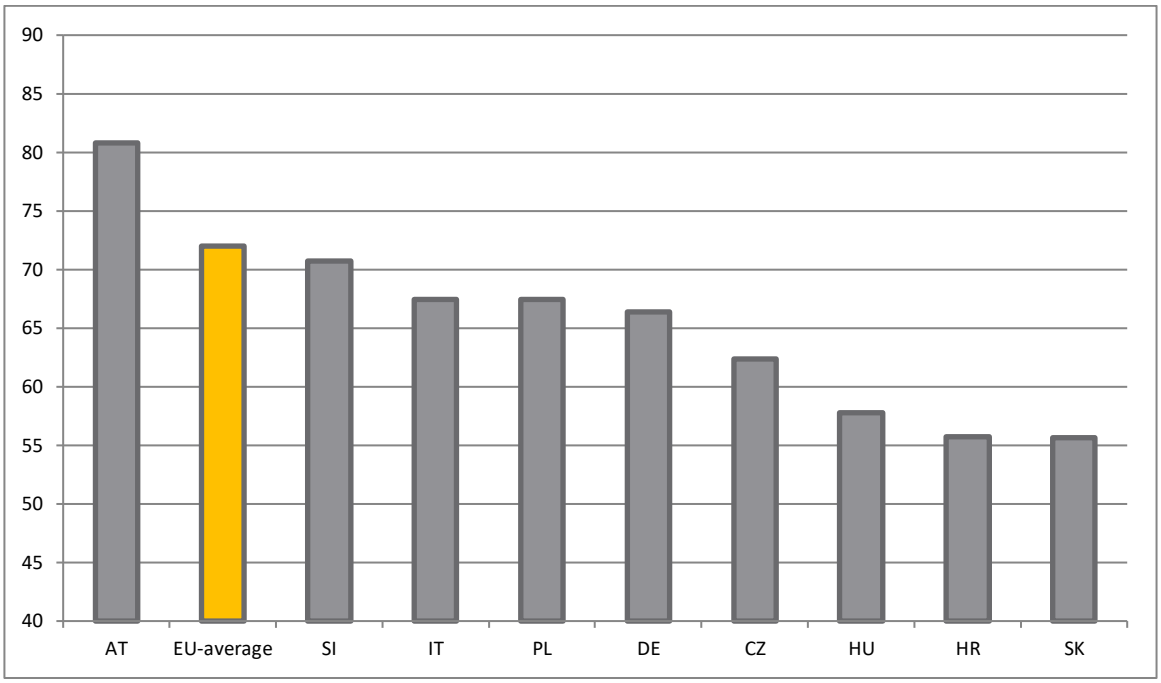


Source: Eurostat

Finally, also in digital public services central Europe have a below EU average performance. The respective index to show this consists of two elements, i.e. e-government and e-health. It is presented in Figure 17 and shows that only Austrian digital public services are above average, while in the other eight central Europe countries such services need to be expanded to reach European standards.

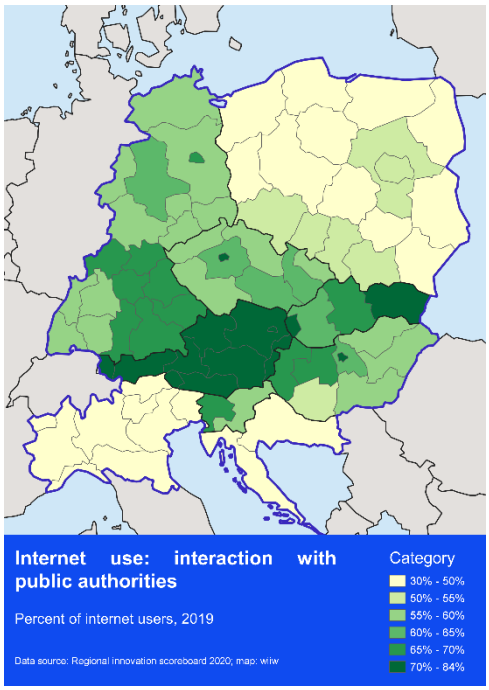
Additionally, Figure 18, shows an example of the rare regional data on digitisation, i.e. the number of online interactions with public authorities as a percent of internet users by regions. Firstly, the figure demonstrates the highly aggregated regional breakdown of the data for certain countries as German and Polish data are only at the NUTS-1 level, while elsewhere it is at least at the NUTS-2 level. Secondly, despite this, apart from strong differences between countries the figure indicates that digital public services are more used in urban areas. However, it cannot be determined whether this is because digital public services are more developed or whether digital skills are on average higher in urban areas.

Figure 17: Index on digital public services



Source: EU Commission, DESI, https://digital-agenda-data.eu/datasets/desi/visualizations

Figure 18: Online interactions with public authorities, percent of internet users, 2019



Source: Eurostat; Map: wiiw

2.3.2. Policy needs and potentials

Based on the analysis the policy need is clear. Central Europe needs to improve in the uptake and use of digital technology at all spheres of the society, i.e. private, business and public. Given the many fields where digitisation can be usefully applied, there are ample options for transnational cooperation to support the digitisation of central Europe. Ideally, this support is aligned with bigger European strategies and policies, like the Digital Single Market strategy.

To improve the benefits of digitalisation for citizens, interesting fields for support are e-culture, e.g. the digitalisation of cultural heritages, the media and news sector or making digital content easier accessible and more inclusive. Regarding the business sphere, clearly the uptake of digital technologies needs to be supported. This can start at a small scale, e.g. through pilot actions, exchange of knowledge, creation of support services through transnational cooperation, thereby showcasing potential ways how to modernise companies, especially SMEs in central Europe. For such projects it is important to consider from the start potential upscaling possibilities to leverage the effects of the transnational cooperation funding.

Other potential fields for support include issues related to trust and cyber-security, which becomes the more important the more data, including crucial information like credit card details etc., is exchanged electronically. Again, such initiatives may focus on SMEs (but not only), as their capacities to tackle these issues might be more limited. Additionally, transnational cooperation can link up with European wide policies such as a) the “European platform of national initiatives on digitising industry”, b) “Digital Innovation Hubs”, c) “Strengthening leadership through partnerships and industrial platforms” or more sectoral initiatives like the Innovative Medicines Joint Technology Initiative.

A specific place based approach could be the establishment and the operation of “fablabs” and/or “science labs” with open access to different user groups. These labs can play a mediating role between companies, young professionals in the education and private users to introduce digital based technologies in particular in rural areas.

As far as e-government is concerned transnational cooperation has a high potential to contribute to the modernisation of public administration with ICT, especially also in rural areas, which may have less capacities to do this on their own. Additionally, transnational cooperation is the ideal platform to a) develop solutions for enabling cross-border mobility with interoperable digital public services and b) facilitate digital interactions between public authorities and the private sector.

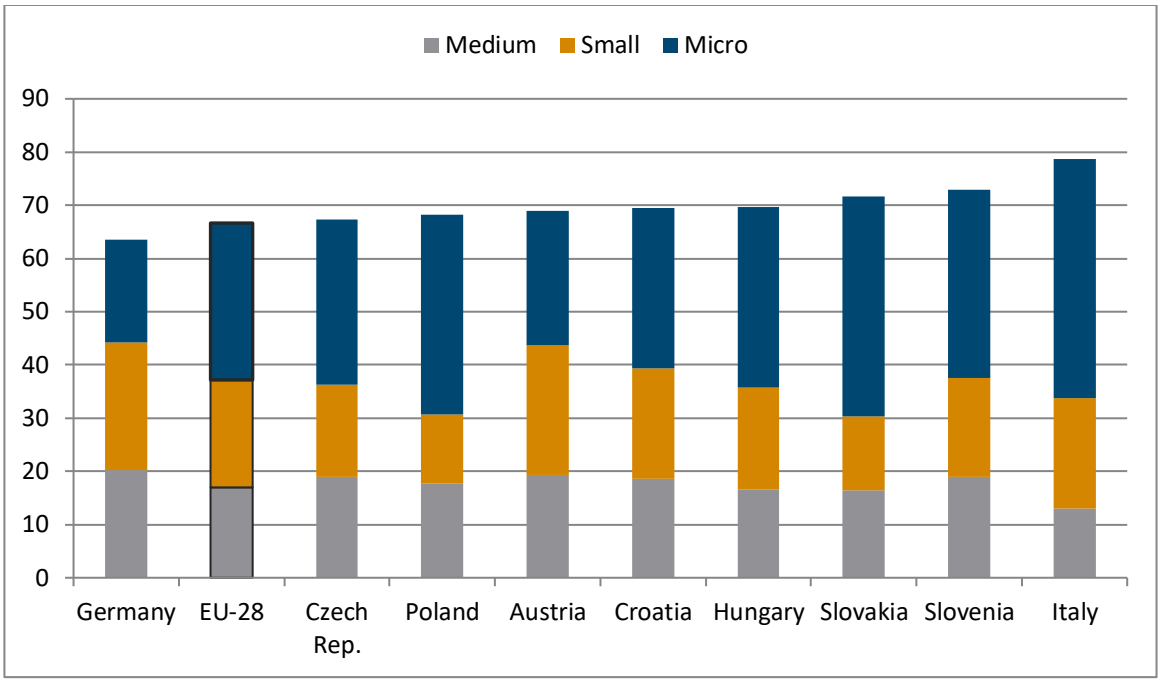
The Interreg CENTRAL EUROPE 2014-2020 Programme shows its potential to contribute to the digitisation of central Europe with a number of projects. For example, the SYNERGY project supports the development of Industry 4.0 and the uptake of modern technologies like 3D printing trough creating networks and cooperation. Industry 4.0 is also the focus of the ECOS4IN project supporting the cooperation between smart specialisation strategies stakeholders. By connecting five central European innovation hubs, the AMiCE project will target three major challenges to SMEs wanting to adopt advanced manufacturing technologies, i.e. a) the access to knowledge, b) the promotion of investments and c) the competitiveness of these projects. The 3DCentral project focuses on smart engineering and rapid prototyping, promoting and supporting their use over Central Europe including territorial innovation “islands”. The 4STEPS project supports the central Europe SME’s transition to Industry 4.0 through involving the most relevant innovation actors and the creation of a network of “Digital Innovation Hubs”.

The niCE-life project operates in the e-health field creating health care models for people with Alzheimer's and Parkinson's diseases using key enabling technologies such as sensor technologies, ICT and data analysis techniques. Likewise, the INTENT project will employ inter alia digital tools for developing innovative ways for patient-centred cancer care. The digitalLIFE4CE is another e-health project. It focuses on digitally integrated healthcare systems by providing potential technological solutions to improve the cooperation of the respective stakeholders.

2.4. ENHANCING GROWTH AND COMPETITIVENESS OF SMES, INCLUDING BY PRODUCTIVE INVESTMENTS

In 2016 SMEs, i.e. companies with less than 250 employees, accounted for two thirds of the EU-28 employment. In central European countries, except for Germany their importance is even higher as SMEs account for up to 79% (in Italy) of total employment (see Figure 19).

Figure 19: Share of SMEs in total country employment, 2016



Note: Medium firms: 50 to 249 employed; Small: 10 to 49 employed; Micro: 0 to 9 employed.
Source: Eurostat

Given their importance for the EU economies, Structural Funds will continue to support SMEs in the period 2021-2027, inter alia under the specific objective “Enhancing growth and competitiveness of SMEs, including by productive investments” in the “Smarter Europe” Policy Objective. Productive investment in this context is

understood as "*as investment in fixed capital or immaterial assets for enterprises, which are to be used for the production of goods and services, thereby contributing to gross capital formation and employment*."[19]

The topic of SME competitiveness, especially in a territorial context was recently discussed in a very comprehensive ESPON study[20], which, besides making a huge data collection effort (as territorial SME data are rare), analysed the status-quo for SMEs (up to the year 2014), identified the main drivers of their competitiveness and derived a number of important policy conclusions.

Thus, according to the study important determinants of regional SME performance are a) the economic framework conditions, b) location related factors like transport costs, regional networks and linkages, agglomeration economies, local knowledge spillovers, c) the level of technology and innovation, d) infrastructure, e) the skills available on the labour market, f) the quality of local governance and institutions and g) social capital.

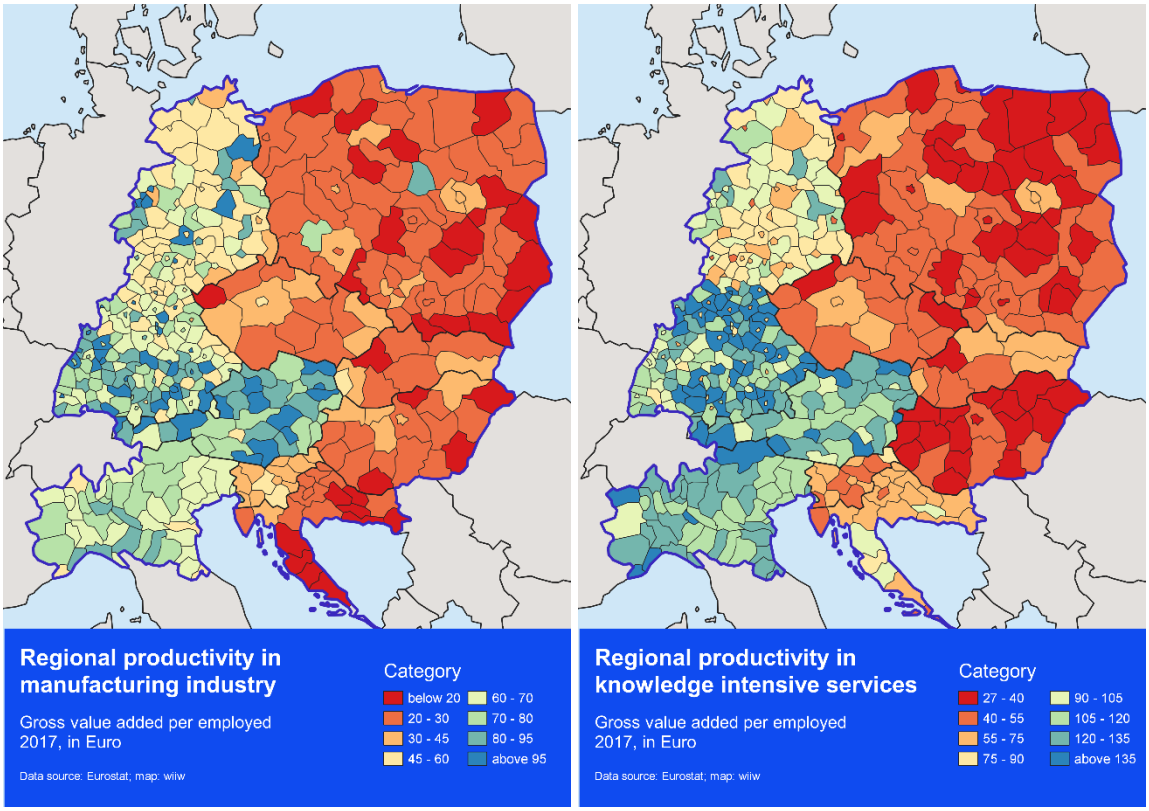
Before discussing the implications of the study's policy conclusions for transnational cooperation in the central Europe, we provide a short overview of the SME related challenge using the latest available data.

2.4.1. The challenges

As illustrated above, SMEs are the backbone of the central European economy. Supporting them expectedly not only contributes to make them more competitive at a national, European or even global level, it will also contribute to the generation of employment and income for the population and in the end also help the Eastern central European countries to converge. The necessity to economically catch up is still considerable. This is illustrated by the two maps in Figure 20, showing manufacturing and knowledge intensive services productivity levels at the territorial NUTS-3 level. In both maps, productivity is calculated in Euro terms, because both manufacturing goods and knowledge intensive services are internationally tradable so that the maps reflect the full extent of convergence needed.

[19] European Court of Auditors. (2018) EU support for productive investments in businesses - greater focus on durability needed – Special Report. https://www.eca.europa.eu/Lists/ECADocuments/SR18_08/SR_DURABILITY_EN.pdf
[20] ESPON. (2018), Small and Medium-Sized Enterprises in European Regions and Cities - Applied Research - Final Report, Version 31/01/2018.

Figure 20: NUTS-3 productivity in manufacturing (left graph) and knowledge intensive services (right graph), 2017



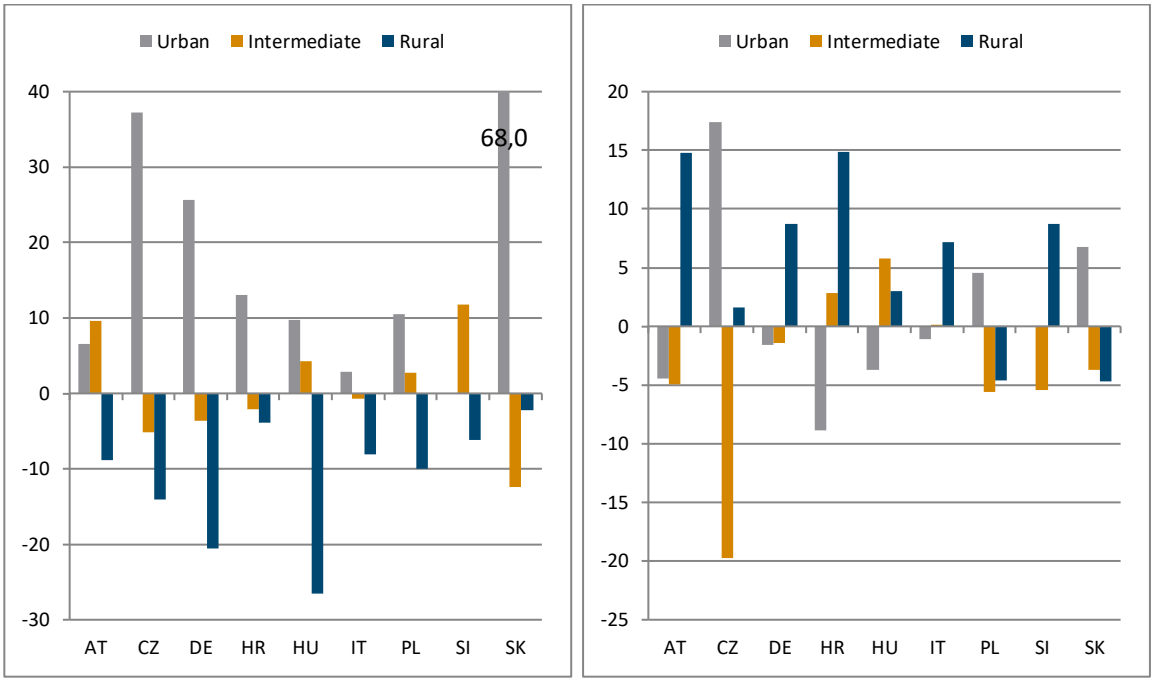
Source: Eurostat; Map: wiiw

This converge need is still quite substantial; in manufacturing the productivity levels of the most productive central Europe regions is around 5 to over 10 times higher than in the least productive central Europe regions. For knowledge intensive services this ration is similar.

Notably, from a territorial perspective manufacturing productivity is more equal across regions than knowledge intensive services productivity, which is by far highest in urban agglomerations. In the maps this is indicated by the green or light green spots that are mostly highly urbanised regions or regions close to them. The urban-rural divide is made more explicit in Figure 21, which shows manufacturing and knowledge intensive services levels by type of regions. Productivity levels are expressed as percentage point deviation from the national average productivity level.

From the graphs the strong economic position of the urban regions is apparent, by showing their big productivity advantages against intermediate and rural regions. Thus, in the urban regions manufacturing productivity is around 10% to up to 68% (Slovakia) higher than the average in the respective country (except for Italy). By contrast, rural manufacturing productivity is below the respective country average, specifically in Hungary and Germany. The differences in knowledge intensive services are on average lower. Also, urban region not necessarily have a productivity advantage, at least not in Austria, Germany, Croatia, Hungary and Italy. In those regions, productivity in knowledge intensive services rural regions have a higher productivity. In the Czech Republic, Slovenia and Slovakia productivity is highest in the urbane regions.

Figure 21: Productivity* in industry (left) and knowledge intensive services (right), 2017 by degree of urbanisation, percent difference to the national average



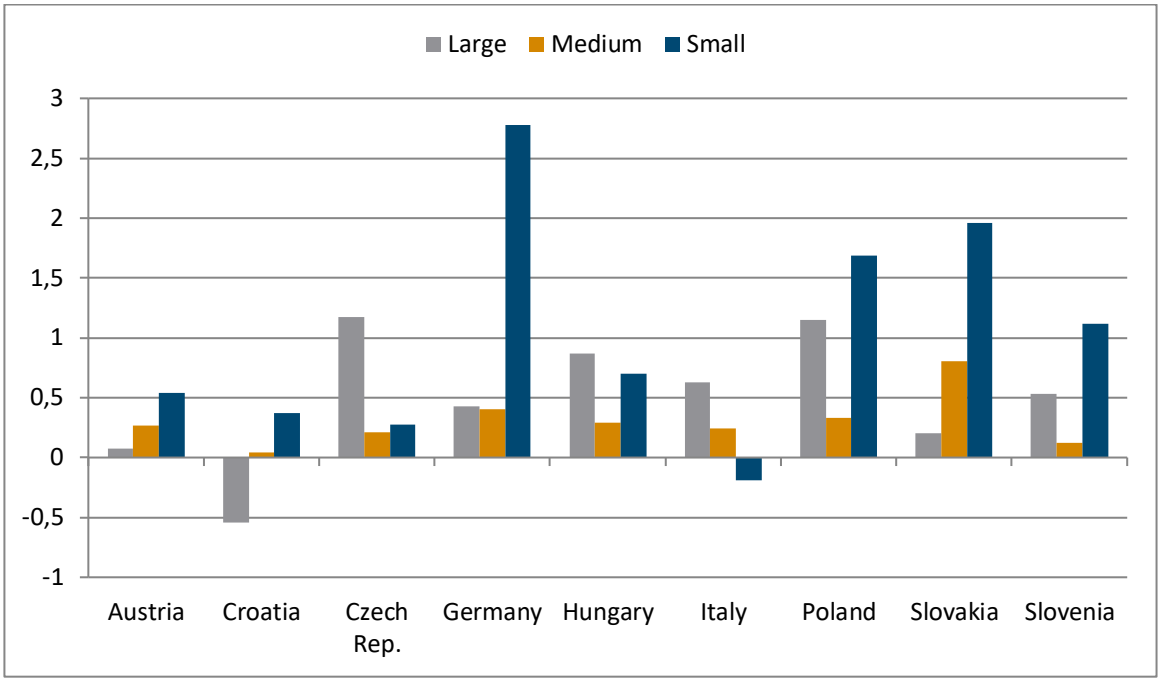
*Note: Productivity is calculated as Gross value added per employed person
Source: Eurostat

Taking a closer look at SMEs is, especially at the territorial level, extremely difficult given that adequate data are not publicly available, or if they are available, national and regional data are not necessarily consistent[21]. Therefore, we restrict ourselves here to demonstrate the importance of SMEs for employment growth at the national level, while for a more detailed analysis we refer to the comprehensive ESPON SME study.

Figure 22, shows the contribution SMEs to total economy employment growth (as contributions to the employment growth rate). Evidently, in all countries except the Czech Republic, Hungry and Italy, small enterprises are by some margin the most important generators of new employment. Like Poland, the Czech Republic and Hungary still benefitted from relatively strong employment growth of large enterprises, assumingly driven by foreign direct investment. In Poland though, employment in small enterprises grew ahead of employment in large enterprises, while in the Czech Republic and Hungary it did not.

[21] Also, data from the ESPON SME project, which made a huge effort in collecting territorial data, was not available via ESPON. Also, data from this project ends in 2014, so that it is not completely up to date.

Figure 22: Contribution to total employment growth, 2013-2016; by size class of enterprises - contribution to the total economy employment growth rate (annual average)



*Note: Hungary: growth rates from 2011-2016
Source: Eurostat

2.4.2. Policy needs and potentials

There is still a need for the Eastern European countries to catch-up and converge towards more developed EU countries. Given the weight that SMEs have in the respective economies, supporting them to grow and become more competitive is an important pillar in any convergence related strategy. Yet, given the many determinants of SME development and given the inherent differences in the regions' characteristics, e.g. like the degree of urbanisation, makes identifying a single strategy applying to all cases difficult.

That is why the ESPON SME study[22] argues for tailor-made strategies for unique regions that account for the multidimensionality of SME development, both from a geographical as well as from a SME growth driver perspective. Key elements of such strategies that are also suited to be supported by transnational cooperation are:

- Development of smart specialisation strategies should focus on flexible technologies and competencies that can be applied to different industries. These strategies should reflect the specific context of the respective region, include the relevant actors and stakeholders and provide links to research and innovation.
- Local factors as well as the specific strength and weaknesses of the regions need to be identified and taken into account in the development strategies.

[22] ESPON. (2018) Small and Medium-Sized Enterprises in European Regions and Cities - Applied Research - Final Report, Version 31/01/2018.

- In addition to traditional sectors, this includes especially the local cultural and creative sector, which not only is an important driver of innovation, modernisation (e.g. through digitisation) and specialisation strategies but also an important provider of employment and income (e.g. in the tourism and creative industry sectors).
- Coordination of activities and policies, e.g. in the urban-rural context are important and need to be fostered by local and regional authorities.
- The quality of local and regional governance is important, as transparency, stability, clear and simple regulations, clear communication and a proactive approach from the authorities are conducive for SME development. Thus, local and regional authorities can facilitate the contact and communication between start-ups, SMEs, entrepreneurs, and local bodies.
- Communication and transport infrastructure need to ensure accessibility, e.g. for urban areas through intra-regional networks and connections to the hinterlands, and good connections to economic centres in more rural areas.
- Intercommunal and regional development of attractive industrial development zones
- Synergies between different funding instruments need to be explored and cross-funding with parallel instruments should be coordinated to increase their efficiency.
- Business education can be improved through exchange between regions as well as dissemination of information and good practices.
- Reduction of administrative burdens to reduce obstacles for SMEs and increase business creation.
- Quadruple or even quintuple helix models of innovation, including the academic, business, government, civil society and the media should be encouraged as many initiatives originate at local or regional levels (e.g. from NGOs, community groups and associations).

The Interreg CENTRAL EUROPE 2014-2020 Programme demonstrates the capacity of transnational cooperation to support SMEs through a large number of projects. For example, the project CE-Connector focuses on the cooperation between public providers who leverage investments and groups of business angles and start-ups. Its aim is improving the local ecosystems to facilitate investments in start-ups, which are relevant for the regions' smart specialisation strategies. Similar, the CERIecon assists entrepreneurs to create new firms by developing strategies, actions plans, pilot actions, training, and tools to create new-type comprehensive regional innovation ecosystems in seven Central Europe regions. The CROWD-FUND-PORT project improves stakeholders' competences to engage in crowdfunding of start-ups, while the project ENTER-transfer facilitates ownership transfer and business succession at national and transnational level to keep existing and viable SMEs alive.

The S3HubsinCE project promotes the bottom-up implementation of smart specialisation strategies by generating new transnational support structures based on connected "Digital Innovation Hubs" (DIH). In turn, the KETGATE project, connects business support organisations and research institutes to help SMEs accessing high-level technology for advanced materials, photonics and micro-& nano-electronics in the areas of transport, health and food. The uptake of modern technology in other sector (e.g. agriculture) is supported by the Transfarm 4.0 project that supports the direct participation of farmers in the precision farming sector.

2.5. DEVELOPING SKILLS FOR SMART SPECIALISATION, INDUSTRIAL TRANSITION AND ENTREPRENEURSHIP

Regions' absorptive capacity plays a vital role for creating innovative and new business ideas. One major determinant of absorptive capacity represents the locally available human capital[23]. A skilled and educated population allows a region to acquire knowledge and know-how[24]. In turn, this is essential for exploiting technological innovations and bringing them together with local conditions and prospects. Thus, the human capital endowment is an important precondition for realizing smart specialisation and forming a flourishing entrepreneurship in regions. A local economy that makes use of its regional comparative advantages can influence regions' productivity and subsequently economic growth path in a positive way. This is also why such a process can foster industrial transition towards higher value-added sectors[25].

A strong and competitive local economy further allows promoting attractive job opportunities and career paths. This provides an important incentive to hold individuals, most notably skilled and educated individuals, in regions. Less prosperous regions, mostly in the periphery, face a severe problem of brain drain, as those regions do not offer adequate opportunities[26]. This loss of human capital puts the regions' absorptive capacity under pressure[27].

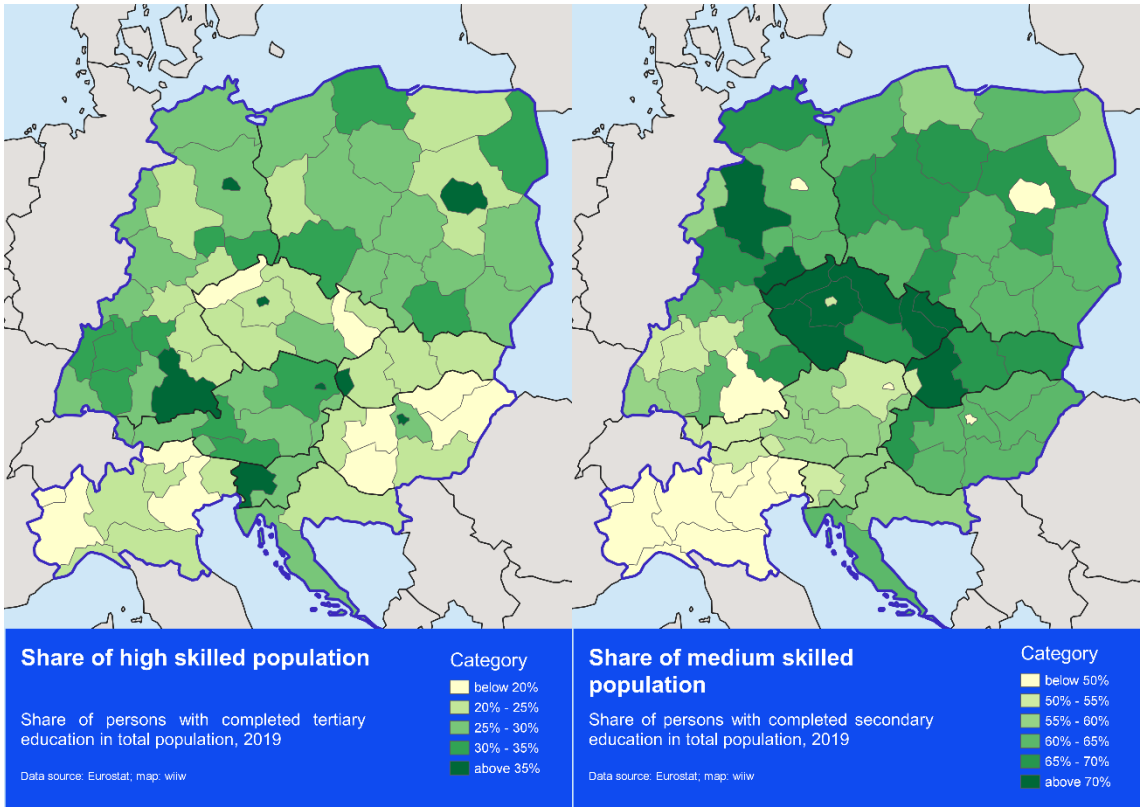
EU policy addresses education and skills in various programmes and strategies. The Europe 2020 strategy includes the goal to increase the share among individuals aged 30-34 with tertiary education to at least 40% until 2020. Moreover, in 2016 the EC launched a New Skills Agenda for Europe. Within this framework, social partners, the industry and other stakeholders are encouraged to work together to improve the quality of skills and training. One key element has been to promote the acquisition of digital skills via collaborations among education, employment and industry stakeholders. Furthermore, in 2013 the European Commission adopted the so-called Entrepreneurship Action Plan that calls for improving the presence and quality of entrepreneurial learning as well as education[28]. In addition, the Erasmus for Young Entrepreneurs programme aims at bringing newly established and potential entrepreneurs together with well-experienced entrepreneurs to promote the exchange of entrepreneurial knowledge.

2.5.1. The challenges

The standard way to capture the regional human capital endowment is to look at individuals' educational attainment. In particular, tertiary education brings with it highly skilled human capital. Although the number of higher educated individuals in the EU has increased remarkably[29], there is a wide disparity across and within most central Europe countries. Figure 23 shows the proportion of the population with completed tertiary education on the left panel, while that with completed secondary education on the right panel.

[23] OECD, 2013.
[24] ÖIR and PAN IGiPZ, 2012.
[25] European Commission, 2018a.
[26] European Committee of the Regions, 2018.
[27] ÖIR and PAN IGiPZ, 2012
[28] European Commission, 2012.
[29] Eurostat, 2018.

Figure 23: Share of population with completed tertiary education, 2019 (left); share of population with completed secondary education, 2019 (right)



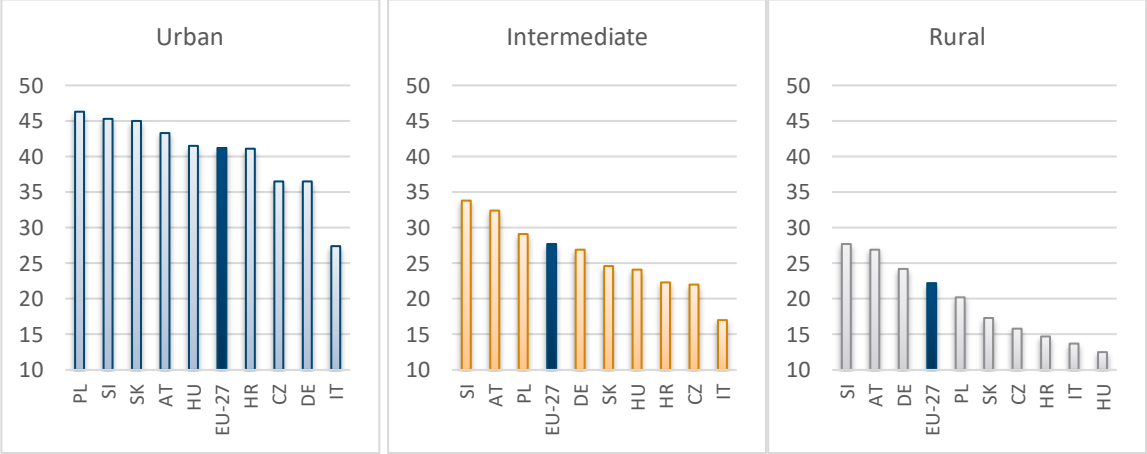
Source: Eurostat; Map: wiiw

As concerns highly educated individuals, there is a substantial disparity across central Europe regions. Generally higher shares can be found in Austria, Slovenia, Croatia, Germany and Poland. In contrast, Italy, Hungary, Slovakia and the Czech Republic experience comparatively lower rates of highly educated individuals. However, all central Europe countries share one common pattern: the concentration in urban regions, mostly cities. Individuals often have an incentive to move to urban regions, as agglomeration effects typically induce better job opportunities, a better infrastructure and higher wages[30]. These so-called pull effects are reflected in shares above 35% in Berlin, Vienna, Bratislava, Prague, Budapest and Warsaw. The concentration is visibly most pronounced in the Czech Republic, Slovakia and Hungary. Thus, within those countries, other regions than capital cities face the lack of highly educated individuals. Not surprisingly, Hungary and Slovakia are also among the countries with a relatively high exposure to brain drain[31]. In addition, in Italy low rates can be found in each of the central Europe regions.

The within-country concentration of highly educated individuals towards urban regions is also clearly indicated in the overall urban-rural differences in Figure 24.

[30] European Commission, 2011.
[31] European Committee of the Regions, 2018.

Figure 24: Share of population with completed tertiary education, 2019; by degree of urbanisation: cities (left graph), towns and suburbs (middle graph) and rural areas (right graph)

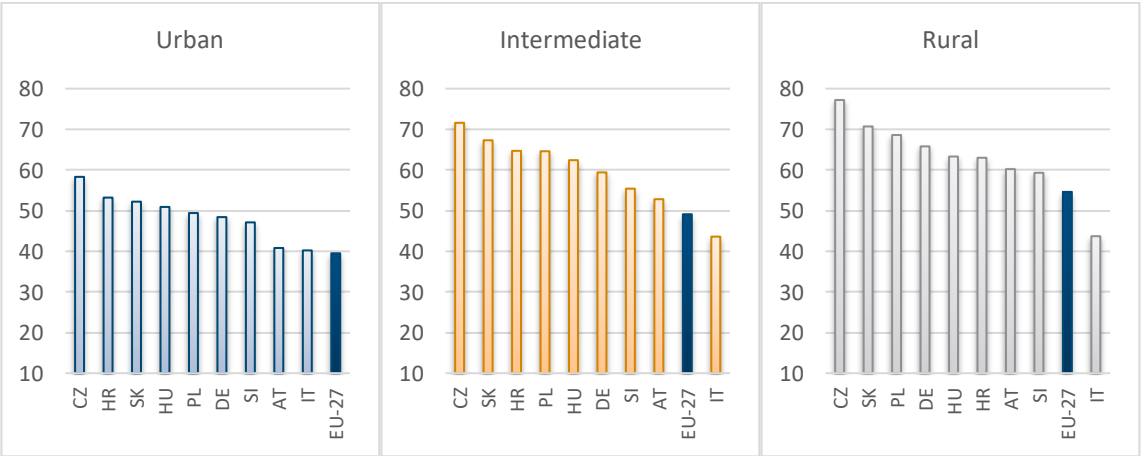


Source: Eurostat – Labour force survey

Turning to medium education individuals, the map suggests a different pattern. Contrary to the pattern of highly educated, high shares of medium educated individuals are identified in the Czech Republic and Slovakia. Interestingly, this pattern is not found in Italy. As it is visible, Italy shows low rates also with respect to secondary education.

Overall, the shares of medium educated individuals are less spatially concentrated as compared to highly educated individuals. This pattern is also visible in the urban-rural comparison in Figure 25. Differences across urbanisation levels are somewhat smaller. In general, central Europe countries perform quite well as, as the endowment of medium educated individuals is predominately above the EU-27 average level.

Figure 25: Share of population with completed secondary education, 2019; by degree of urbanisation: cities (left graph), towns and suburbs (middle graph) and rural areas (right graph)



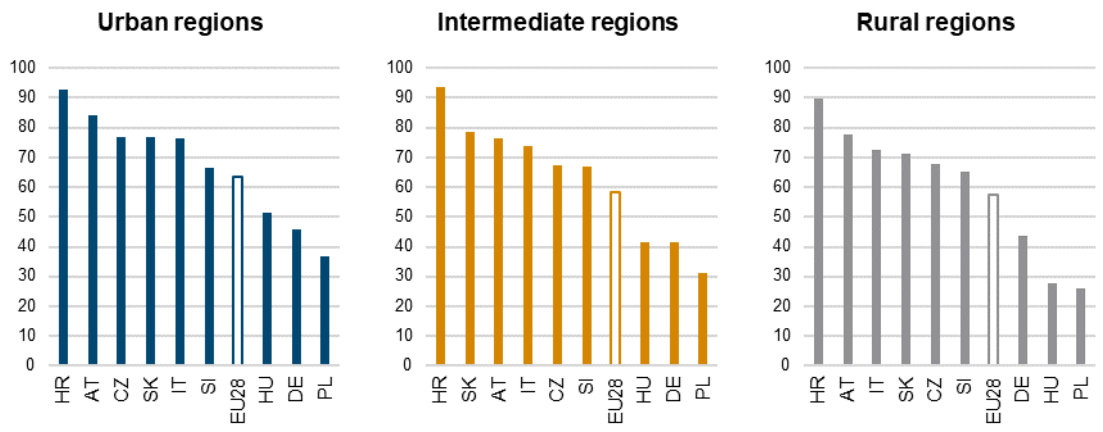
Source: Eurostat – Labour force survey

One key element of smart specialisation is collaboration between local stakeholders: the private sector, in particular entrepreneurs, are encouraged and supported by public policy to discover new activities as well as potentials[32]. This certainly requires an optimal set of skills and education, which however goes beyond pure formal learning. Soft skills, such as self-confidence, adaptability as well as creativity, are important for a successful entrepreneurial discovery process[33].

The European Commission therefore advocates a stronger focus on entrepreneurship education. This also includes integrating it to a higher extent in the formal education system. In current educational programmes, entrepreneurship education only plays a minor role.

It is therefore important to acquire additional skills through further education and training possibilities. In this respect, informal learning allows improving skills via coaching, guided visits, self-learning or learning groups. Such learning activities can also contribute to foster individuals' competences, most notably social skills. Figure 26 contrasts the proportion of individuals who are involved in informal learning activities by urbanisation degrees.

Figure 26: Informal Learning 2016, in % of Total Population by degree of urbanisation



Source: Eurostat – Labour force survey

Although there are remarkable differences across countries, the pattern within countries is rather robust. Proportions are similar in rural and urban regions within countries. Most importantly, only three countries show a participation rate below 50%: Hungary, Germany and Poland. Especially in Hungary, the low level of information learning activities is of concern, as it is paired with low shares of highly educated individuals (see Figure 23).

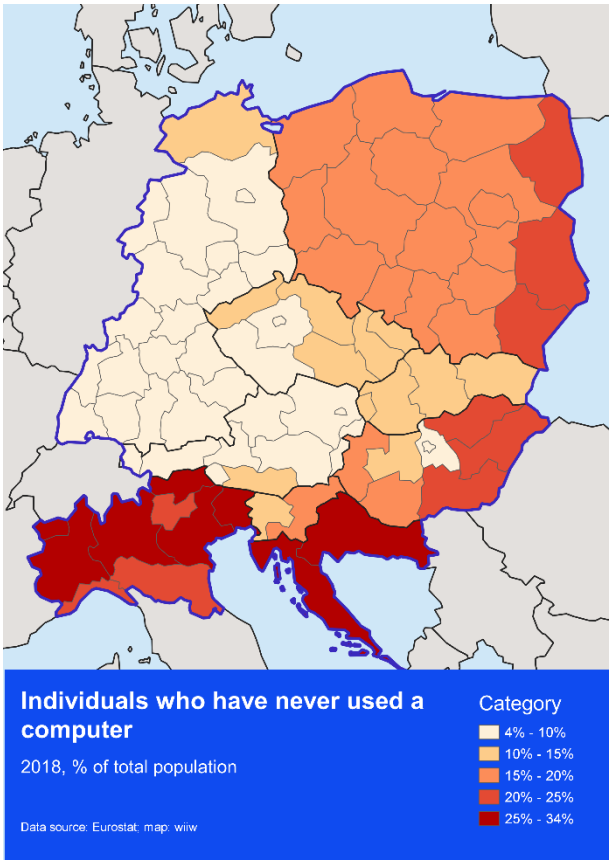
The EU further highlights the vital role of digital skills for the smart specialisation process[34]. To adequately integrate the digital transformation into smart specialisation strategies, it needs the availability of ICT tools and skills. Entrepreneurs need to have access to a workforce equipped with advanced digital skills.

[32] OECD, 2013.
[33] European Commission, 2012.
[34] European Commission, 2018b.

The EU addresses digital skills in its New Skills Agenda, which includes the upskilling of the existing workforce. The EU further launched the programme Digital Skills and Jobs Coalition that aims at forming national coalitions between local stakeholders to improve digital skills. Moreover, the Digital Opportunity traineeship initiative promotes cross-border traineeships for ICT specific fields.

The individuals' experience with ICT activities broadly captures the available digital skill level in countries. A higher share of individuals without any experience with ICT indicates a low availability of digital skills and subsequently fuels the risk of lagging behind. Figure 27 depicts the proportion of individuals who have never used a computer in central Europe regions. As it is clearly visible, regions in the North-East as well as South of the central Europe territory perform much worse than other regions. In particular, Poland, Hungary, Croatia and Italy experience a relatively high share of individuals without any experience with the computer. In Italy and Croatia this group even accounts for shares above 25% of the total population in regions.

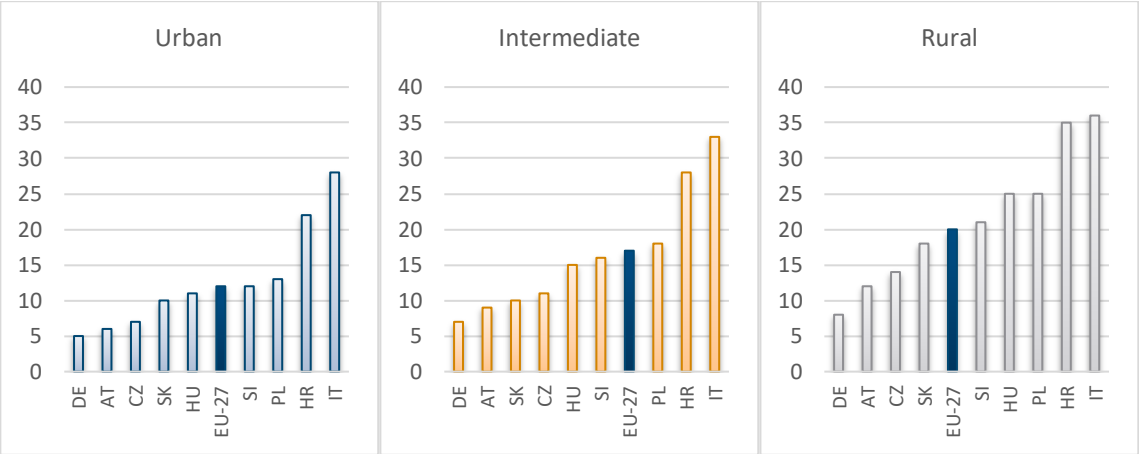
Figure 27: Individuals who have never used a Computer 2018, in % of Total Population



Source: Eurostat.

This pattern of lagging regions is also reflected in the ranking of countries by urbanisation degrees as illustrated Figure 28. Moreover, an urban-rural contrast arises by making an overall urban-rural comparison: digital skills tend to be more pronounced in more urban regions.

Figure 28: Individuals who have never used a computer 2018, in % of total population, by urbanisation degrees



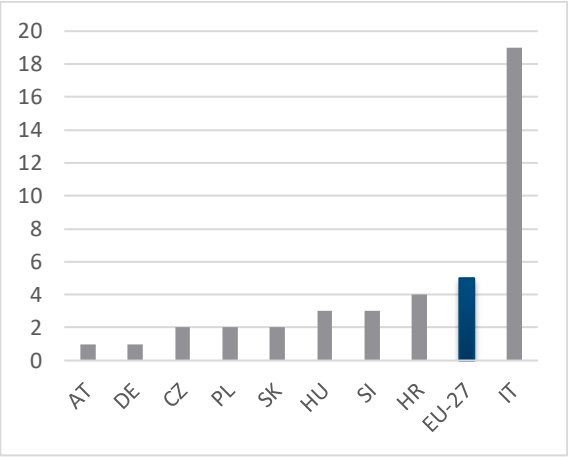
Source: Eurostat [isoc_ci_cfp_cu].

The patterns within each urbanisation level however are rather robust. In particular, Poland, Italy[35], Slovenia and Croatia show higher shares – even above the respective EU-27 average – in all urbanisation levels. Accordingly, those central Europe countries appear to lag behind when it comes to digital skills. Only in Slovakia, Austria and Germany shares are more balanced across the urbanisation levels at rather low levels.

Figure 29 depicts the computer usage of individuals in the age 25-34. Although the number needs to be interpreted carefully[36], the statistics indicate that around 19% of Italians within this age group have never used a computer. While only around 1% of the respondents reported that they have never used a computer in Germany and Austria, also in the remaining CE countries this share is lower than the EU average of 5%. A lack of digital skills among younger individuals can hinder smart specialisation processes in particular in the future.

[35] In Italy, the shares are much affected by shares in Southern regions. Although the Italian CE regions face comparatively high proportions, even higher shares are spatially concentrated in regions in South Italy.
[36] Eurostat (2019) does not flag statistical issues

Figure 29: Individuals who have never used a computer 2017, in % of population aged 25-34



Source: Eurostat [isoc_ci_cfp_cu].
Note: data for HU and IT from 2015

2.5.2. Policy needs and potentials

In order to combine innovation, know-how and local strengths, the availability of an adequate level of human capital is required. Only highly skilled and educated human labour can create and implement innovative strategies for local economies that support industrial transition. A low level of human capital endowment can be a major obstacle for smart specialisation and a competitive entrepreneurship.

Although the European Commission has already put a lot of effort into upskilling and education, the analysis at hand identifies a number of bottlenecks that need to be addressed. Some central Europe countries are characterised by a highly pronounced concentration of highly educated individuals. Such a process leaves regions, in particular more rural areas, with a lack of human capital which makes it even more difficult to implement smart specialisation. Increasing the offer and the awareness of attractive job and career opportunities can bring a strong incentive to stay in or even move to these regions. In turn, this allows offsetting to some extent the pressure that some regions face due to brain drain.

Some central Europe countries further face a low participation rate in informal learning activities. Such activities however can play an important role when it comes to soft skills, including adaptability as well as creativity. A further bottleneck regards the level of digital skills: some central Europe regions indicate high numbers of individuals without any computer experience. This signals the risk of lagging behind in the digital transformation process at present and, even more importantly, in the future. An increase in the supply and the awareness of formal and informal digital training opportunities is needed to accelerate the upskilling of individuals with respect to digital skills.

The upskilling and training of individuals have been addressed via various EU strategies and programmes. This even includes a call for a stronger focus on entrepreneurial education. Although education and training programmes are largely determined by national institutions, TNC can contribute to enhance local human capital endowment.

The challenge to have access to the required human capital is not specific to a certain country. As illustrated above, regions in central Europe countries face similar problems with respect to skills. This clearly indicates a key potential for TNCs. Stakeholders from different countries can work together to create innovative ideas for local strategies in line with local needs as well as conditions and business cooperations. Common concepts for traineeship and other training possibilities can be established together with the local industry to allow a stronger exchange also across borders. Furthermore, platforms can be used together to promote attractive job and career possibilities in regions.

The Interreg CENTRAL EUROPE Programme has already funded some projects that incorporate elements of the discussed potentials. For instance, the past 2007-2013 CENTRAL EUROPE project YURA promoted educational offers for younger individuals in less developed regions. In this project, schools worked together with companies and other stakeholders. Likewise, the past CENTRAL EUROPE 2007-2013 WOMEN project addressed career options of well-educated young women in less prosperous regions by promoting attractive job opportunities. A further good example for TNCs is the 2014-2020 CENTRAL EUROPE project digitalLIFE4CE[37]. The project aims at fostering cooperation between technology providers from different regions and at finding ways to increase investments in start-ups.

These projects emphasis the principal potentials for TNCs and can act as a guide for the design of future projects.

[37] https://www.interreg-central.eu/Content.Node/digitalLIFE4CE.html

3. A GREENER, LOW-CARBON EUROPE (PO2)

3.1. INTRODUCTION

In November 2018, the EU presented its **2050 long-term strategy** for a prosperous, modern, competitive and climate-neutral economy by 2050 – A Clean Planet for all.[38] It is a long-term vision for achieving net-zero greenhouse gas emissions by 2050 by investing into realistic technological solutions, empowering citizens, and aligning action in key areas such as industrial policy, finance, or research while simultaneously ensuring social fairness for a just transition and not leaving behind any region nor any population group. The vision is in line with the 2015 Paris Agreement objective to keep temperature increase to well below 2°C and pursue efforts to keep it to 1.5°CThe 2050 long-term vision for a climate-neutral future describes eight scenarios/pathways, consisting of seven building blocks. These seven strategic areas are: energy efficiency; deployment of renewables; clean, safe and connected mobility; competitive industry and circular economy; infrastructure and interconnections; bio-economy and natural carbon sinks; carbon capture and storage to address remaining emissions.

Territorial cooperation is important when it comes to problems crossing national borders, such as combating the negative effects of climate change. So far, Interreg CENTRAL EUROPE strongly contributed to sharing knowledge across countries, helped building new one as well as exchanging existing knowledge and experiences between and within regions. It aimed to bring together different stakeholders and aimed to improve the capacity of the public sector and related entities.

For the upcoming period 2021-2027, the European Commission[39] suggested five Policy Objectives of Cohesion Policy, of which PO2 is to focus on a **Greener, carbon free Europe**, implementing the Paris Agreement and investing in energy transition, renewables and the fight against climate change. Together with the first objective (a Smarter Europe), about 65% to 85% of Regional Development Fund and Cohesion Fund investments should be geared towards these two priorities. The ESPON outlook for the new programming period (2017) suggests boosting renewable energy sources and developing the circular economy. The recent cohesion report (2018) states that more investments are needed in energy efficiency, renewables and low-carbon transport to reduce greenhouse gas emissions.

Accordingly, the 2021+ Policy Objective 2 "'A greener, low-carbon Europe by promoting clean and fair energy transition, green and blue investment, the circular economy, climate adaptation and risk prevention and management" includes the following Specific Objectives:

- promoting energy efficiency measures and reducing greenhouse gas emissions
- promoting renewable energy;
- developing smart energy systems, grids and storage /at local level/; outside TEN-E
- promoting climate change adaptation, risk prevention and disaster resilience;
- promoting sustainable water management;
- promoting the transition to a circular economy;

[38] COM (2018) 773 – A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy.
[39] https://ec.europa.eu/regional_policy/en/2021_2027/

- enhancing nature protection and biodiversity, green infrastructure in the urban environment, and reducing pollution;
- promoting sustainable multimodal urban mobility.

The analysis below follows this structure.

3.2. ENERGY EFFICIENCY AND REDUCING GHG EMISSIONS

3.2.1. The challenge

The **2050 long-term strategy** puts a central role to energy efficiency measures in reaching net-zero greenhouse gas emissions in 2050 and cites it as a no regret policy. In fact, decarbonising industrial processes and especially reducing energy demand in buildings, in both the residential and services sectors (including public buildings), will play a central role.

Overall, energy efficiency targets have been long included in the EU policies. The **2020 climate and energy package** (as of 2007, also known as 20/20/20 targets)[40] sets key targets to be reached in 2020: a 20% cut in greenhouse gas emissions (from 1990 levels), 20% of EU energy from renewables, and 20% improvement in energy efficiency. The Energy Efficiency Directive[41] requires EU Member States to lead the way with energy efficiency through public procurement, energy utilities to encourage users to cut their consumption, and large companies to perform energy audits. The Energy Performance of Buildings Directive[42] requires Member States to apply energy performance standards for new and existing buildings and ensure certification schemes are in place. The **2030 climate and energy framework** (adopted by the European Council in October 2014)[43] sets policy objectives for the period from 2021 to 2030. Key targets for 2030 are: at least 40% cuts in greenhouse gas emissions (from 1990 levels), at least 32% share for renewable energy, at least 32.5% improvement in energy efficiency. The targets for renewables and energy efficiency were revised upwards in 2018 (from previous 27%).

The **Energy Union** package was adopted in 2015, which targets five closely related and mutually reinforcing dimensions: energy security; internal energy markets; energy efficiency; decarbonisation and research, innovation and competitiveness.[44] By end of 2018, Member states had to submit their draft 10-year National Climate and Energy Plans (NCEPs) for the years 2021-2030 to the European Commission. These national plans outline how EU countries will achieve their respective targets on all dimensions of the energy union, including a longer-term view towards 2050.

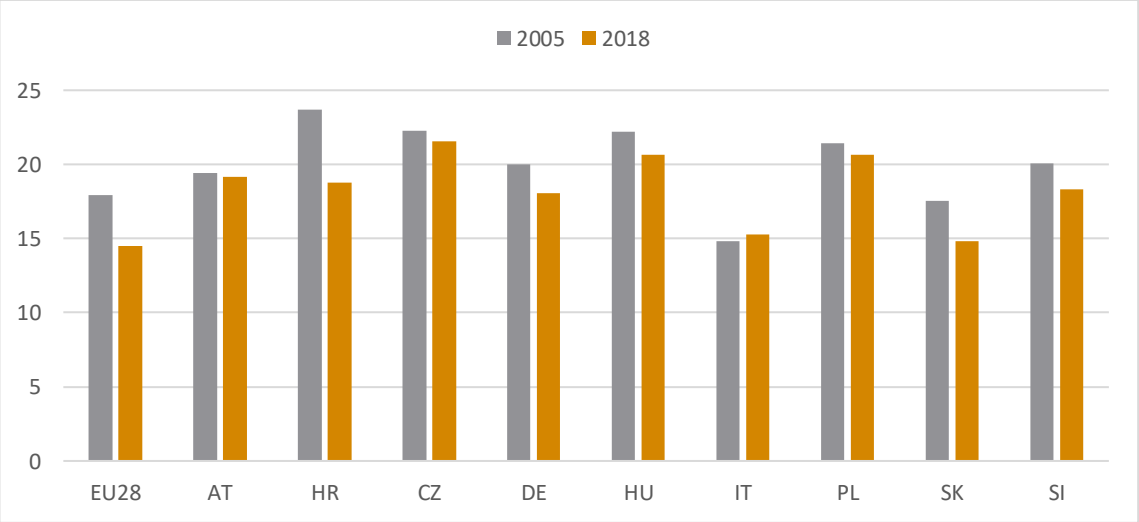
In September 2020, the EU Commission presented their assessment of the 27 NECPs[45]. Regarding renewable energy, the Commission estimated the combined commitment of the Member States at 33.1%-33.7%, i.e. above the renewable energy target of 32%. With respect to energy efficiency the cumulative energy savings of the national NECPs are estimated to be around 29.6%, i.e. lower than the energy efficiency

[40] https://ec.europa.eu/clima/policies/strategies/2020_en
[41] Directive 2012/27/EU on energy efficiency
[42] Directive 2010/31/EU on the energy performance of buildings
[43] https://ec.europa.eu/clima/policies/strategies/2030_en
[44] Energy Union package – a framework strategy for a resilient Energy Union with a forward looking climate change policy. COM (2015) 80 final.
[45] COM(2020) 564 final

target of 32.5%. Combined, the EU Commission estimates that the EU will surpass its 2030 GHG emission reduction target of 40 % by around 1 percentage points (i.e. a projected reduction of 41%).

Looking at one indicator of energy efficiency, the final energy consumption per m2 in the residential sector, Figure 30 depicts the level for the central European countries. Final energy consumption is above average for all countries of the region, except Italy and Slovakia. Between 2005 and 2018, final energy consumption decreased in all countries; only in Austria and Italy it stayed nearly the same.

Figure 30: Final energy consumption per m2 in the residential sector, at normal climate, 2005 and 2018, in kg of oil equivalents / m^2

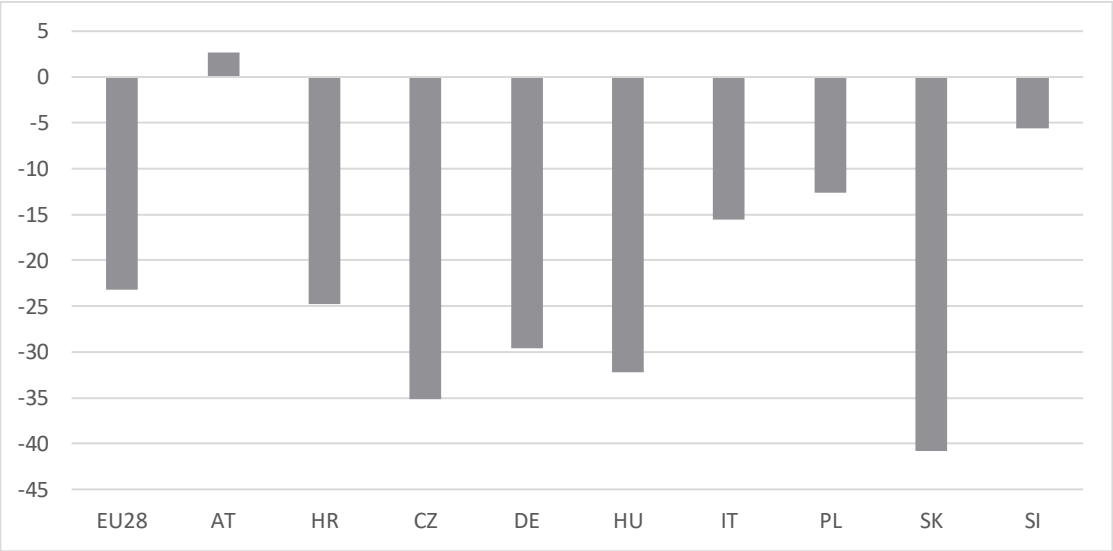


Source: DATA MAPPER for Energy Union Targets
https://ec.europa.eu/energy/en/atico_countrysheets/database?indicator=EE4&type=bar

In 2018, greenhouse gas intensity (greenhouse gas/capita) in the CENTRAL EUROPE region was highest and above EU average (8.6 kg C02 eq/pers) in the Czech Republic (12.2), Poland (11.0), Germany (10.7) and Austria (9.2). It was about the EU average for Slovenia (8.5) and Slovakia (8) and somewhat below for Italy (7.3), Hungary (6.6) and especially Croatia (5.9).[46] Between 1990 and 2018, efforts to curb greenhouse gas emission differed across countries (see Figure 31). On average, greenhouse gases were reduced by 23% in the EU-28, thus meeting the 2020-target of a 20% cut of GHG emissions by 2020 already. GHG cuts were high in Slovakia, Germany, Hungary and the Czech Republic. However, in Slovenia, GHG emissions have declined only by 5.7% and in Austria they have even increased by 2.7% during this time period.

[46] https://ec.europa.eu/energy/en/atico_countrysheets/database?indicator=DE5&type=bar&subindicator=DE5-A1

Figure 31: Greenhouse gas emissions in CE and EU-28 during 1990-2018, in %



Source: DATA MAPPER for Energy Union Targets:
https://ec.europa.eu/energy/en/atico_countrysheets/factsheets?indicator=DE1&country=EU28

3.2.2. Policy needs and potentials

Despite considerable progress in terms of energy efficiency there is still further improvement needed for many central Europe countries to reach EU-average levels of energy efficiency.

For this, future transnational policies could cover:

- The energy performance of buildings; this includes the energy efficient construction of new buildings (e.g. with high-performance thermal insulation) as well as the renovation of existing buildings making use of innovative emerging insulation solutions.
- The uptake of efficient energy consuming equipment in buildings for heating/cooling, for water heating and cooking and all public, domestic and tertiary sector appliances
- Introducing smart buildings that are capable to adapt operation to the needs of the occupants, while ensuring optimal energy performances
- Shift to energy efficient modes of public and private transport (see also the transport related PO3)
- Optimise industrial energy use and processes, e.g. reduce the heat losses, introduce energy recovery processes, shift production processes to environmentally friendlier mode.

In the previous CENTRAL EUROPE Programme 2007-13, energy efficiency was the target of eight projects, particularly focusing on the building sector. The project topics ranged from establishing Energy Performance Contracting (EPC) models to performing Life-Cycle Assessments of SMEs. Examples include CEC5 (Demonstration of energy efficiency and utilisation of renewable sources through public buildings), GovernEE (Good Governance in Energy Efficiency), CombinES (Combining energy services with subsidy schemes to

finance energy efficiency in central Europe) and EnSURE (Energy Saving in Urban Quarters through Rehabilitation and New Ways of Energy Supply).[47]

In the current programming period, there are several projects which aim to improve energy efficiency of public buildings and other public infrastructure. These include municipal and administrative buildings (BOOSTEE.CE, eCentral), especially schools (TOGETHER, FEEDSCHOOLS, ENERGY@SCHOOL), but also wastewater treatment plants and municipal waste management infrastructure (REEF 2W) as well as public lighting ('Dynamic Light').

3.3. RENEWABLE ENERGY

3.3.1. The challenge

The **2050 long-term strategy** aims to 'maximise the deployment of renewables and the use of electricity to fully decarbonise Europe's energy supply'. Renewables are thus a main building block in the 2050 long-term strategy and besides energy efficiency a no regret policy.

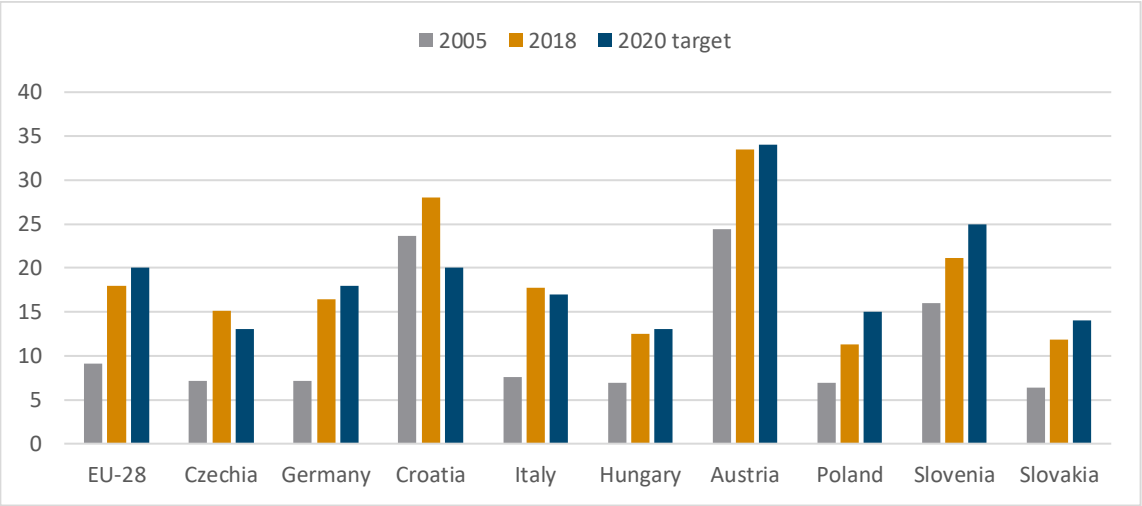
As energy efficiency targets, targets for renewables have been long included in the EU policies (see above for 2020 climate and energy package and 2030 climate and energy package). The main legislative document, aiming at promoting the renewables in the EU, is the Renewable Energy Directive.[48]

The most recent renewable energy progress report[49] concludes that the EU is on track for reaching its target for 2020: in 2018, the share of renewable energy in the EU energy mix reached 18%. However, the pace of increase of the renewable energy share has slowed down since 2014. With regard to individual sectors, for heating and cooling the main renewable source was biomass, for electricity hydropower and wind, and for transport biofuels. A clear paradigm shift is happening towards renewables in the electricity sector because of a decline in the cost of electricity from solar PV and wind power. In 2018, one third (32%) of the EU 28 gross electricity production was generated by renewables.

Generally, the share of renewables is depending on geo-physical features. While along coastal regions in Europe, especially along the shores of the North and Baltic Seas the potential for wind energy is high, solar energy production potential is higher in the Southern part of Europe. Due to varying different starting positions and policies with respect to renewables, there are different targets for renewables for the individual EU Member States. In the central Europe region, the share of renewables in gross final energy consumption varies between 33.5% in Austria (largely on account of hydropower) and 13% in the Czech Republic in the year 2018. Figure 32 shows that a number of countries have already outperformed their 2020 target: Croatia, the Czech Republic and Italy. Further efforts have to be taken in Austria, Germany, Hungary, Poland, Slovakia and Slovenia. Looking at more details for regions, Figure 33 shows the share of electricity generated from hard coal and lignite. This share is particularly high for regions in Poland and the Czech Republic. Figure 34 then depicts the share of electricity generated from renewables. Austrian and Hungarian regions show higher shares of renewables compared to the other countries of the region.

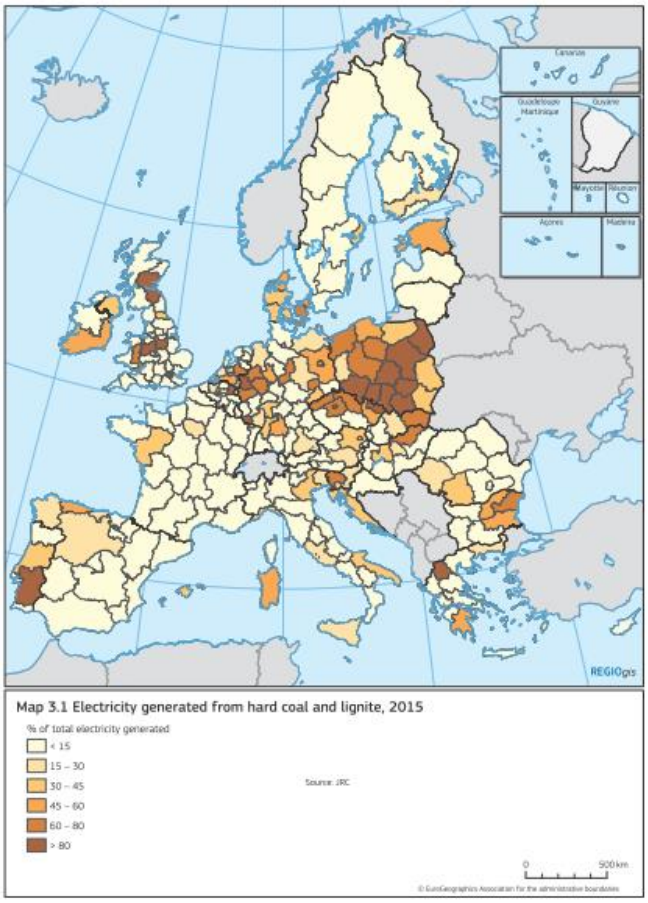
[47] See Greenovate (2014).
[48] Directive 2009/28/EC on the promotion of the use of energy from renewable sources and revised Directive (EU) 2018/2001.
[49] COM(2019) 225 final

Figure 32: Share of renewable energy in gross final energy consumption in CE and EU-28, in %



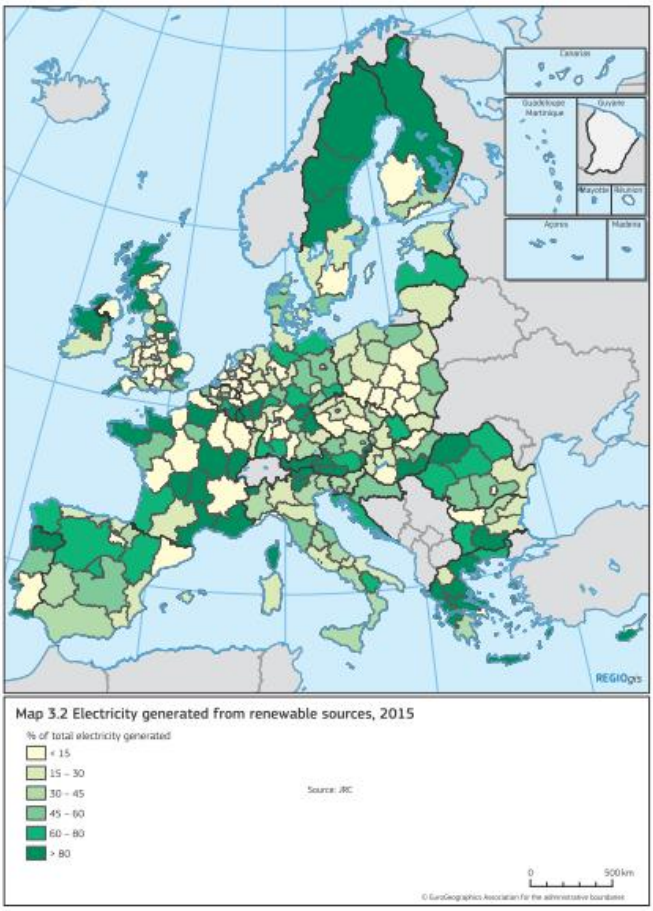
Source: Eurostat

Figure 33: Electricity generated from hard coal and lignite, 2015



Source: European Commission (2017), Seventh Report on Economic, Social and Territorial Cohesion

Figure 34: Electricity generated from renewable sources, 2015



Source: European Commission (2017), Seventh Report on Economic, Social and Territorial Cohesion

3.3.2. Policy needs and potentials

There is a clear policy need to further increase the use of renewable energy sources in central Europe. The range of potential policy areas is large and includes inter alia:

- Supporting research and industrialisation of the renewable energy supply chain to drive down costs;
- Develop regional and local policies including adequate support schemes to increase the use of renewable energy;
- Continuing the development of existing technologies, developing new technologies and testing them to make renewable energy production more efficient;
- Continuing the development of storage capacities;
- Promote the use of renewable energy in the public, private and business sphere as well as at the local and regional level.

The potential of transnational cooperation to contribute to the shift to renewable energy lies in:

- The exchange of knowledge, technology and experiences to make renewable energy production or consumption available to regions, cities, villages that have insufficient own capacities.
- The use of pilot actions to test new solutions in renewable energy production.
- The capacity to create plans and strategies
- The development of innovative capacity building tools to bring the concept of renewable energy closer to people, firms and public authorities.

To use the transnational cooperation potential fully it is recommended that its projects have some reference to the national renewable energy action plans to provide a basis for political buy-in and the potential of up-scaling or roll-out of project results.

In the previous CENTRAL EUROPE Programme 2007-13, renewables were targeted broader than in the current programme. Several programmes aimed at the use of biomass, such as 4BIOMASS (Fostering the sustainable use of renewable energy sources in central Europe – Putting biomass into action) or Coach BioEnergy (Strengthening the energetic use of biomass in central and eastern Europe by establishing a standardised transnational consulting net for regions). Other projects include RUBIRES (Rural biological resources – Supporting the Use of Renewable Energy Sources and Increasing Energy Efficiency) and TRANSENERGY (Transboundary Geothermal Energy Resources of Slovenia, Austria, Hungary and Slovakia).[50]

In the current programming period, there are several projects on energy planning with certain focus on renewable energy resources. 'GeoPLASMA-CE'[51] aims to foster the share of shallow geothermal use in heating and cooling strategies in central Europe. The project builds a knowledge platform aiming to disseminate profound background information on shallow geothermal energy use and to connect people interested in this topic across Europe. In addition, there are six pilot areas in Germany, Poland, Czech Republic, Slovakia, Austria and Slovenia. The 'RURES'[52] project sets out to exploit the potential of renewable energies (RES) and energy efficiency (EE) in rural regions. The ENTRAIN[53] project focuses on district heating networks powered by renewable sources. It will start 9 pilot local district heating networks and 9 heat planning studies, together with the development of 3 innovative financial schemes and the adaptation and adoption of the Austrian "QM Holzheizwerke" quality management system.

3.4. SMART ENERGY SYSTEMS, GRIDS AND STORAGE

3.4.1. The challenge

Smart Grids can be understood as upgraded electricity networks that include digital communication between supplier and consumer, intelligent metering and monitoring systems. Upgrading existing energy networks is essential to a) enable the larger scale roll-out of renewable and distributed energy resources, b) improve the security of networks and c) create opportunities for energy saving and energy efficiency.

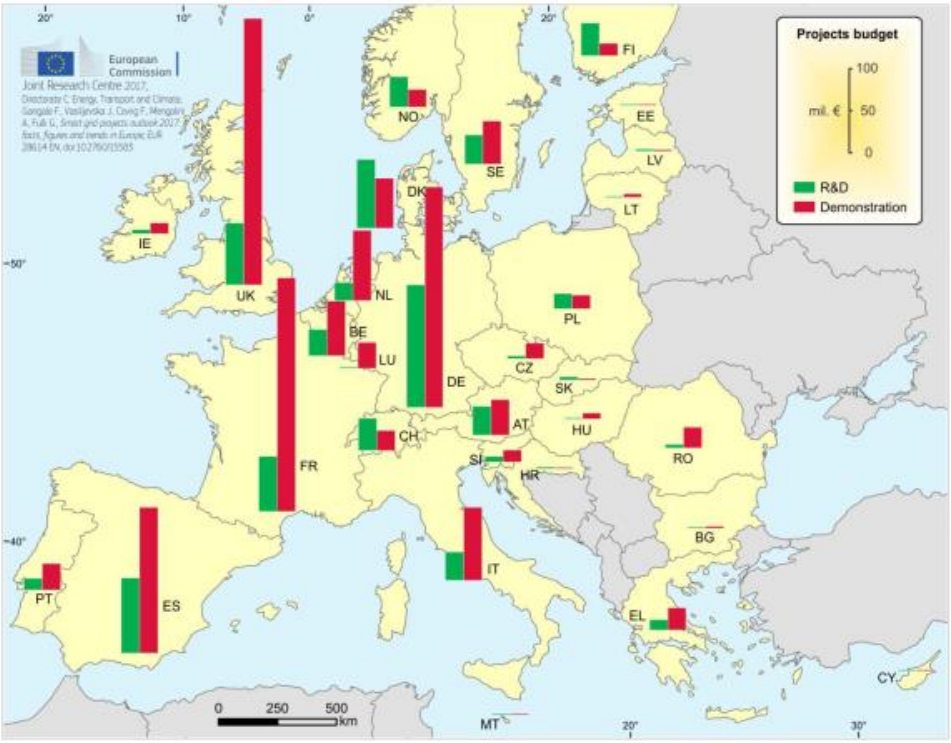
According to the EU Commission "*smart grids can manage direct interaction and communication among consumers, households or companies, other grid users and energy suppliers. It opens up unprecedented*

[50] See Grennovate (2014).
[51] https://www.interreg-central.eu/Content.Node/GeoPLASMA-CE.html
[52] https://www.interreg-central.eu/Content.Node/RURES.html
[53] ttps://www.interreg-central.eu/Content.Node/ENTRAIN.html

possibilities for consumers to directly control and manage their individual consumption patterns, providing, in turn, strong incentives for efficient energy use if combined with time-dependent electricity prices. Improved and more targeted management of the grid translates into a grid that is more secure and cheaper to operate. smart grids will be the backbone of the future decarbonised power system. They will enable the integration of vast amounts of both on-shore and off-shore renewable energy and electric vehicles while maintaining availability for conventional power generation and power system adequacy."[54]

Energy storage has contributed to the operation of the electricity system already over decades. However, with the growing share of renewable energy in total energy production, energy storage has become more important as it is a necessary condition for the functioning of smart grids, efficient energy consumption and the flexible generation of renewable energy. At the same time, energy storage can take many different forms including inter alia a) mechanical storage technologies store energy in various forms of kinetic and/or potential energy, b) thermal storages converting electricity to heat and c) chemical storage, e.g. through electrolysis and batteries.[55]

Figure 35: Number of smart grids R & D and demonstration projects in the EU



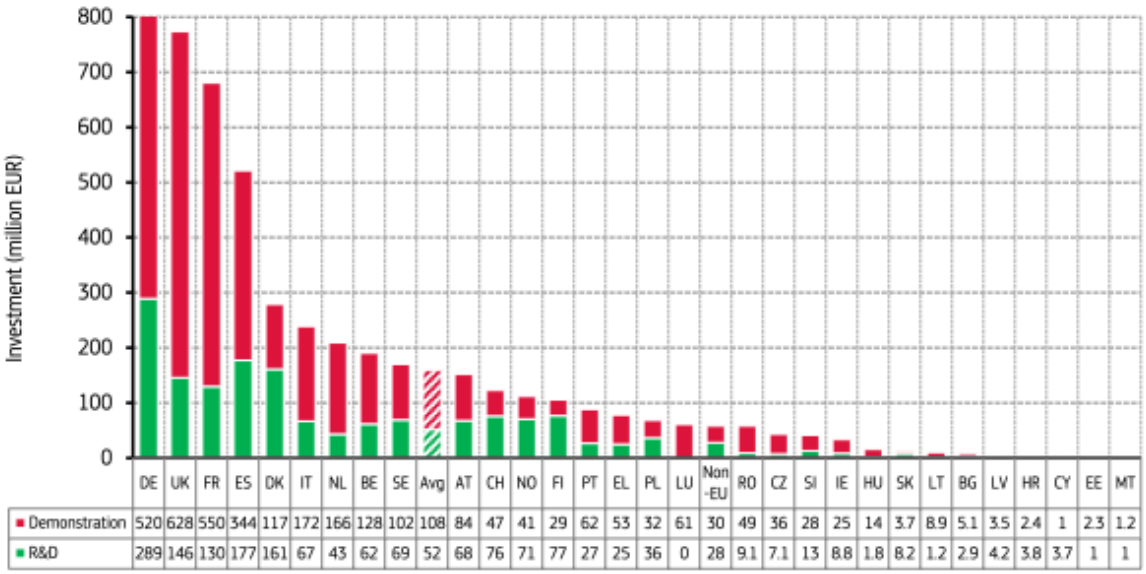
Source: JRC (2017)

Given the growing importance of renewable energy and hence the growing importance of smart grids and storage investment in smart grid R & D and demonstration activities has grown considerably in Europe. However, the levels of investment vary greatly across countries. This is illustrated by the number of smart grid R&D and demonstration projects (Figure 35) as well as the corresponding amount of investment in million

[54] EU Commission (2011)
[55] EU Commission (2017)

Euro (Figure 36) as collected by the EU Commission Joint Research Centre. From this information it is evident, that Germany is the leading country in Europe in terms of development of smart grids and storage systems. Yet, all other central Europe countries have investment levels (partly much) below the EU average, thus indicating a significant need to catch-up in the development of modern energy systems.

Figure 36: Total investment (million EUR) in smart grid projects per country



Source: JRC (2017)

3.4.2. Policy needs and potentials

The evidence shown above provides a clear message: Central Europe needs to implement smart-grid and modern storage technologies, not only to catch up with the rest of Europe, but also to facilitate the switch to renewable energy production, provide more secure energy networks and increase the efficiency and hence sustainability of energy use.

Regarding the potentials for transnational cooperation,

Despite the fact that a main junk concerning the introduction of smart grids and storage is physical investment, there is a potential for transnational cooperation to contribute to the development of modern energy systems. The options for transnational cooperation include

- Coordinating activities to clarify framework conditions, regulations, roles, and responsibilities between the different stakeholders and providers at the national, regional local level but importantly also in a cross-border context (to allow smart energy systems be connected across borders)
- Developing ICT solutions required for the implementation of smart grids.
- Show casing of new business models and smart energy services.
- Public awareness raising to motivate public and private consumers to shift to smart energy systems.
- Exchanging information and capacity building for a) grid providers, b) technology providers, c) regions to learn about already existing best-practices and models.

- Pilot actions to demonstrate the value added of smart energy systems
- Coordination of the R&D and education sector to pool the available expertise and transfer existing knowledge.

On the scale of territorial cooperation in the Interreg CENTRAL EUROPE Programme, smart energy systems, grids and storage outside Trans-European Energy Networks are in the focus, i.e. those on a local level. In the current Interreg CENTRAL EUROPE programming period 2014-2020, under the low-carbon priority SO 2.2.[56] the aim is to improve territorially based low-carbon energy planning strategies and policies supporting climate change mitigation. It supports the linking of approaches between the demand and supply sides, taking into account the quality and capacity of energy distribution grids. There is one project explicitly focusing on energy storage: The 'Store-4HUC'[57] project develops solutions for renewable energies and their storage in historical buildings. Historical city centres in Austria, Croatia, Italy and Slovenia will benefit.

3.5. CLIMATE CHANGE ADAPTATION, RISK PREVENTION AND DISASTER RESILIENCE

3.5.1. The challenge

The **2050 long-term strategy** stresses the urgency to protect our planet and the necessity for immediate and decisive climate action. The impact of global warming increases the frequency and intensity of extreme weather events ranging from heat waves, severe droughts, flash floods to forest fires, typhoons and hurricanes. Flood events have particularly affected central and eastern Europe in recent years.

In Europe, vulnerabilities according to the biogeographical regions are fairly different. South-eastern and southern Europe are projected to be hotspot regions with the highest number of severely affected sectors and domains. Coastal areas and floodplains in the western parts of Europe are also multi-sectoral hotspots. Additional hotspots for ecosystems and their services are the Alps. The Continental region, where most of the countries of **central Europe** are located, is generally less severely impacted than other European regions. Nonetheless, climate change consequences can be dramatic and include the following main challengers:

- Increase in heat extremes
- Decrease in summer precipitation
- Increasing risk of river floods
- Increasing risk of forest fires
- Decrease in economic value of forests
- Increase in energy-demand for cooling

A specific problem for urban areas is the Urban Heat Island effect, given by the fact that cities generally show higher temperatures (up to 12° C[58]) compared to their surroundings due to the specific patterns of land cover, street canyon geometry, the amount of artificial surfaces and anthropogenic heat production. Consequences

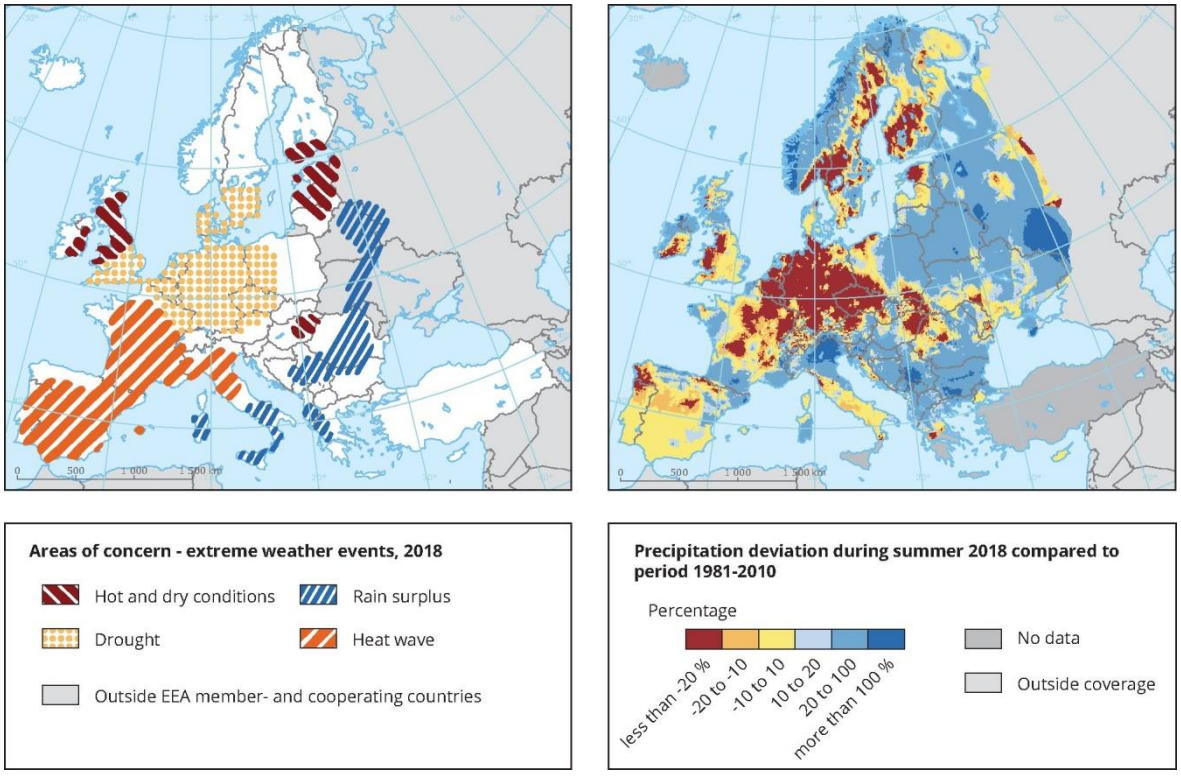
[56] https://www.interreg-central.eu/Content.Node/Low-Carbon.html
[57] https://www.interreg-central.eu/Content.Node/Store4HUC.html
[58] https://www.epa.gov/heat-islands/heat-island-compendium

of these effects are an increasing summertime peak energy demand for cooling, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality and reduction of water quality.

Figure 37 (left panel) shows extreme whether events for the year 2018. In central Europe these included droughts in Germany, parts of Poland, the Czech Republic and Austria. Hot and dry conditions were found in eastern parts of Hungary. Precipitation patterns (right panel) show differences in the regions, with less than 20% of precipitation in Germany and the Czech Republic.

River floods are the most significant natural hazards in central Europe (see wiiw, 2018). This is due to excessive precipitation and temperature rise together with inappropriate and careless land use. As major central European river basins are mostly located in more than one country, this is an interregional problem and requires transnational measures and cooperation. The Flood Directive 2007/60/EC 84 requires an evaluation of flood risk and preparation of flood risk maps for EU Member States. It concludes that central Europe is at high risk in comparison to the rest of Europe and nearly the whole area is potentially exposed to floods. The most alarming perspective was found for the Danube river basin, which covers most of central Europe's territory. In addition, a significant exposure to floods was registered for South and Southeast Poland, the North-West of the Czech Republic, and Eastern Germany (Vistula, Odra and Elbe rivers).[59]

Figure 37: Area of concern - extreme weather events in 2018 (left). Precipitation deviation during summer 2018 compared to period 1981-2010 (right)



Source: EEA. https://www.eea.europa.eu/data-and-maps/figures/areas-of-concern-extreme-weather-events

[59] ÖIR (2012), p 95.

3.5.2. Policy needs and potentials

The need to adapt to climate change and to become more resilient to natural disasters has become more and more prominent over the last years, first at the level of the EU and secondly, also because of the EU Commission`s encouragement to adopt comprehensive adaptation strategies in the EU Member States. Given that, there is a strong potential for transnational cooperation to engage in this area through:

- Linking actors across borders as climate change in general and natural disasters in particular strike areas independent of national boundaries. Thus, transnational adaptation strategies might be a useful addition to the national strategies.
- Adaptation strategies build strongly on the exchange of best-practices and knowledge, which is a particular strength of transnational cooperation.
- Adaptation solutions that are being developed need to be tested practically. This could partly be done via transnational pilot actions.
- Building capacities to enable local and regional stakeholders to identify potential adaptation options.
- Supporting ‘grey’ adaption measures based on civil engineering, like dyke building and beach restoration to prevent coastal erosion
- Supporting ‘green’ adaption measures making use of nature. This includes introducing new crop and tree varieties, allowing room for rivers to naturally flood onto floodplains, and restoring wetlands.
- Supporting ‘soft’ adaption measures, i.e. managerial, legal and policy approaches to change human behaviour; examples include early warning systems for heat waves, floods, pollution etc.
- Address sectoral adaption measures in the areas: a) buildings (e.g. energy efficiency, b) energy (e.g. disaster resilience of energy production), c) health, d) tourism, e) industry, f) transport and g) infrastructure.

Again, it is recommended that any transnational cooperation project in this area is aligned with either the EU Adaptation Strategy or the respective national strategies for political buy in and securing the potential for up-scaling.

In the previous CENTRAL EUROPE Programme 2007-13, the INCA-CE project aimed at reducing the risk of extreme weather by deepening transnational cooperation between meteorologists and concerned public agencies and thus improved the preparedness for severe weather emergencies. In addition, several projects focused on flood protection, e.g. the LABEL project, which focused on the adaptation to flood risk in the Labe-Elbe river basin or INARMA which aims to predict flash floods to reduce their risks.

In the current programming period 2014-2020, several CE projects are related to the risks of river floods: FramWat[60] aims to strengthen the regional common framework for floods, droughts and pollution mitigation by increasing the buffer capacity of the landscape. It will do so by using the natural (small) water retention measures approach in a systematic way. The project Rainman[61] analyses the consequences of heavy rains and the related risks in order to improve integrated management capacities. The PROLINE-CE[62] project has the main objective to improve the protection of drinking water resources as well as of regions against floods and droughts in an integrated land use management approach.

[60] https://www.interreg-central.eu/Content.Node/FramWat.html
[61] https://www.interreg-central.eu/Content.Node/RAINMAN.html
[62] http://interreg-central.eu/Content.Node/PROLINE-CE.html

3.6. SUSTAINABLE WATER MANAGEMENT

3.6.1. The challenge

Water is the most important resource for human mankind. Climate change, however, can undermine water systems with significant impacts. IPPC (2018) outlines climate change scenarios at 1.5C and 2C temperature rise. On the one hand, there will be regions with droughts and precipitation deficits, on the other heavy precipitation evens and floods will occur (see previous SO on climate change adaptation). Water stress will increase with additional 8% of the world's population affected in the 2C scenario (based on year 2000 population). Water shortages have significant impacts on agriculture and food, energy systems, waterborne transport, biodiversity etc. Apart from water availability, water quality, i.e. the contamination of water resources by organic and inorganic pollutants, which requires sustainable water treatment and protection measures, is an important issue.

Given the importance of water, its protection is also at the focus of EU environmental policies and expressed in a number of Directives: the EU Water Framework Directive[63], its 'daughter Directives': Groundwater Directive[64] and Environmental Quality Standards Directive[65], the Urban Waste Water Treatment Directive[66], and others.

As an indicator of water scarcity, the water exploitation index plus (WEI+) is depicted in Map 4. It shows the total renewable freshwater used as a percentage of the total renewable freshwater resources available. Values above 20 % indicate that water resources are under stress, and above 40 % indicate severe stress and a clearly unsustainable use of freshwater resources. Compared to other regions of the world, water scarcity in Europe is not considered to be a severe challenge (see also wiiw, 2018). Within Europe, the central Europe countries are among the countries with the richest water resources. Nevertheless, there are some sub-river basin districts within the region which have higher WEI+ values. Over the year, certain regions in Poland, Northern Germany but also Northern Italy or regions of Slovenia face water stress.

The ecological status of surface waters (rivers, lakes, and transitional and coastal waters) varies between river basin districts. In the EU, 40% have achieved good ecological status up to 2015. In the CE region, 'less than good status' (that is moderate, poor or bad) of more than 90% of surface waters was reported for northern Germany. Other problem areas in the region include in the Czech Republic, southern Germany, Hungary and Poland.[67]

The population connected to urban waste water treatment in 2015 reached 95% in Austria and Germany. The proportion was lower in Italy (60%) and the Central European countries (average 75%). Tertiary treatment ranges between 94% in Austria and Germany to 74% in the Czech Republic, 65% in Hungary, 59% in Poland, 35% Italy and 27% in Slovenia.[68]

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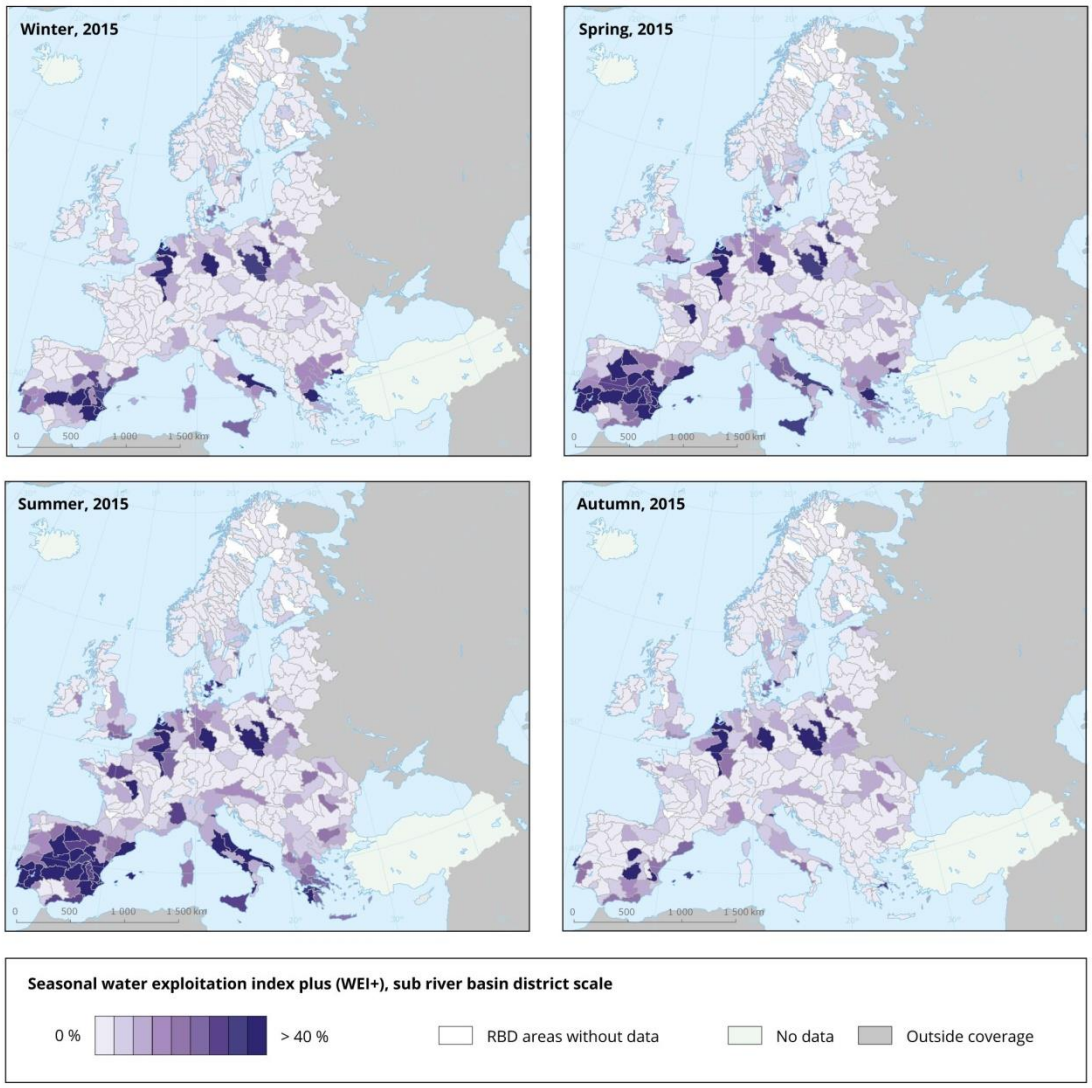
[63] Directive 2000/60/EC establishing a framework for Community action in the field of water policy.
[64] https://ec.europa.eu/environment/water/water-framework/groundwater/framework.htm
[65] https://ec.europa.eu/environment/water/water-dangersub/pri_substances.htm
[66] Council Directive 91/271/EEC concerning urban waste water treatment
[67] https://www.eea.europa.eu/airs/2018/natural-capital/surface-waters
[68] https://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment/urban-waste-water-treatment-assessment-4

Figure 38: Water exploitation index plus, 2015



Source: European Environment Agency

3.6.2. Policy needs and potentials

Evidently water is an essential resource for human mankind. Thus, its protection and sustainable use needs to be and actually is in the focus of policy making. At the European level this is demonstrated by the large number of Directives issued by the EU Commission (see above). The recent "Fifth Water Framework Directive Implementation Report"[69] indicates that EU Member States made improvements in implementing water legislation and in water quality and standards. Reaching full compliance with the objectives of EU water legislation before the 2027 deadline is however very challenging. Correspondingly, there is still a significant

[69] EU Commission. (2019) Report on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC) Second River Basin Management Plans First Flood Risk Management Plans. COM(2019) 95 final.

water related policy need. To satisfy this, the Commission has issued the “Blueprint to Safeguard Europe's Water Resources”[70] that outlines actions for a “*better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular as regards water quantity and efficiency*”.[71]

This “Blueprint” focuses on four main issues: a) the land use and the ecological status, b) the chemical status and pollution, c) water efficiency and d) the vulnerability of EU waters. Transnational cooperation projects directly linking to these points not only will help to improve local water quality and sustainability but also can generate a political buy, e.g. by showcasing water related solutions via pilot actions or via developing water management plans and building capacities. Correspondingly, potential fields for transnational cooperation include:

- Considering water pricing as incentive for an efficient use of water,
- Promoting water metering take up,
- Reducing water use in agriculture, e.g. by the exchange of best practices or piloting technical solutions,
- Raising awareness of water consumption,
- Improving water appliances in buildings, e.g. through pilot actions in public buildings,
- Reducing leakages of the water distribution system,
- Promoting water reuse,
- Improving water governance, including the development of integrated water management approaches,
- Reducing risks of floods and droughts, e.g. by the creation of cross-border information systems,
- Tackling water pollution, via the exchange of best practices and fostering cooperation between administration and experts,
- Increasing water availability in a cost-effective way through rainwater harvesting, storm water management and greywater reuse systems.

During the Interreg CENTRAL EUROPE 2007-2013 Programme, projects on water management were found to improve the knowledge of solutions for preservation of rivers and lakes, sustainable use of water and support of environmentally friendly technologies, and made efforts to revitalise urban riverbanks or addressed groundwater pollution. For example, the URBAN_WFTP project introduced a water footprint (WFTP) approach in urban areas to monitor, evaluate and improve water use. REURIS revitalised urban river spaces. EULAKES supported the sustainable management of central European lakes or FOKS project, which developed new tools for groundwater contamination assessment.

In the current programming period 2014-2020, several CE projects address sustainable water management which includes heavy rain risk management, the protection of drinking water resources and the improvement of river basin management through water retention measures. For example, the boDEREC-CE[72] project aims to design an integrated management model of waterworks that improves the quality of drinking water. This focuses not only on the study of PPCP (pollution from pharmaceuticals and personal care products) behaviour but also on assessing the effectiveness of attenuating this specific type of pollution. The DEEPWATER-CE[73]

[70] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012DC0673
[71] https://ec.europa.eu/environment/water/blueprint/index_en.htm
[72] https://www.interreg-central.eu/Content.Node/boDEREC-CE.html
[73] https://www.interreg-central.eu/Content.Node/DEEPWATER-CE.html

project aims to develop integrated environmental management capacities of responsible public actors so that they become able to plan water resources and adopt managed aquifer recharge schemes in central European countries as a solution to climate change induced water scarcity. The CWC[74] project aims to help municipalities to reform outdated urban water infrastructure systems via applying a circular economy approach, which offers many economic and environmental benefits. The AMIIGA project is pulling together 12 partners from central Europe all with an interest in improving the quality of groundwater, especially of former industrial brownfield sites, by treating urban cores and their surroundings as one unit.

3.7. CIRCULAR ECONOMY

3.7.1. The challenge

The EU's **2050 long-term strategy** sees the promotion of the circular economy as a main building block to reach long-term goals. In more detail, it mentions 'a competitive EU industry and the circular economy as a key enabler to reduce greenhouse gas emissions. Promoting the circular economy in industry through increased re-use and recycling of raw materials can help reduce pollution and greenhouse gas emissions.

The EU has already adopted a comprehensive **circular economy package** in December 2015. It included legislative proposals on waste and an Action Plan to support the circular economy 'Closing the loop – An EU action plan for the Circular Economy'.[75] The circular economy is herein defined as an economy 'where the value of products, materials and resources in maintained in the economy for as long as possible, and the generation of waste is minimised'.[76] The circular economy should hence replace our current 'make-use-dispose' linear economy, which features an unsustainable large resource use.

The Action plan sets out to support the circular economy in each step of the value chain. It is a comprehensive approach starting at the production stage (targeting better product design and efficient production processes) to consumption, repair and remanufacturing, waste management, and secondary raw materials that feed into the economy and water reuse. At a horizontal level, innovation and investment are promoted. Priority areas for concentrated actions were identified which include plastics, food waste, critical raw materials, construction and demolition waste, biomass and bio-based products.

Waste management is one key element of the circular economy package. The EU Directive 2008/98/EC on waste (Waste Framework Directive) establishes a waste hierarchy, which member states should apply: It goes from prevention, preparation for re-use, recycling, recovery thought to disposal. Countries should take measures to encourage the options that deliver the best overall environmental outcome. The revised legislative framework on waste entered into force in July 2018. It sets clear targets for reduction of waste and establishes an ambitious and credible long-term path for waste management and recycling.[77] The main targets are:

- A common EU target for recycling 65% of municipal waste by 2035;
- A common EU target for recycling 70% of packaging waste by 2030;

[74] https://www.interreg-central.eu/Content.Node/CWC.html
[75] European Commission (2015) 614 final.
[76] Ibid.
[77] See https://ec.europa.eu/environment/circular-economy/index_en.htm

- There are also recycling targets for specific packaging materials: paper and cardboard: 85 %, ferrous metals: 80 %, aluminium: 60 %, glass: 75 %, plastic: 55 %, and wood: 30 %;
- A binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2035;
- Separate collection obligations are strengthened and extended to hazardous household waste (by end 2022), bio-waste (by end 2023), textiles (by end 2025);
- Minimum requirements are established for extended producer responsibility schemes to improve their governance and cost efficiency.
- Prevention objectives are significantly reinforced, in particular, requiring member states to take specific measures to tackle food waste and marine litter as a contribution to achieve EU commitments to the UN Sustainable Development Goals (SDGs).

The 2018 circular economy package encompassed the Europe-wide 'EU Strategy for Plastics in the Circular Economy', a communication on options to address the interface between chemical, product and waste legislation, a monitoring framework on progress towards a circular economy at EU and national level and a report on critical raw materials and the circular economy.[78]

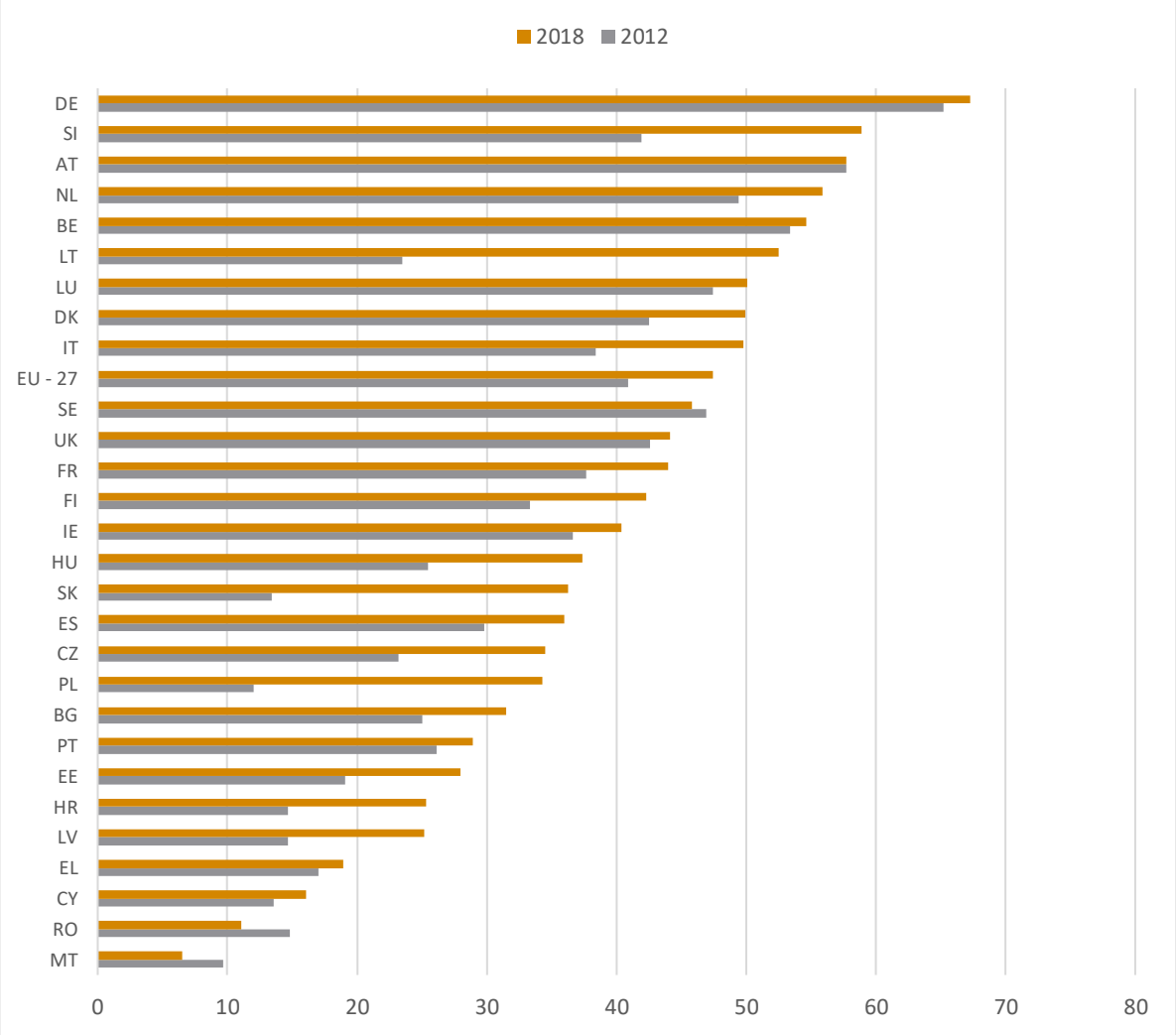
The 'EU Strategy for Plastics in the Circular Economy' is the first EU-wide strategy on plastics. Under these plans, all plastic packaging on the EU market will be recyclable by 2030, the consumption of single-use plastics will be reduced and the intentional use of microplastics will be restricted.[79] In May 2018, the European Commission proposed a Directive on the reduction of the impact of certain plastic products on the environment (Single Use Plastics Directive). These new EU-wide rules target the 10 single-use plastic products most often found on Europe's beaches and seas, as well as lost and abandoned fishing gear. It includes the following set of measures: plastic ban of certain products, consumption reduction targets, obligation for producers, collection targets, labelling requirements and awareness-raising measures.[80] In May 2019, the EU adopted the Directive. Member states now have two years to transpose it into their law.[81]

One important indicator related to the circular economy is the recycling rate of municipal waste[82]. While the generation of municipal waste is still below the EU-average in the central and eastern European countries[83] – but catching up in a negative sense in some countries – recycling rates are still below the EU-average. Figure 39 shows that the highest reuse/recycling rates were observed in Germany (67%), Slovenia and Austria (both 58%-59%) in 2018. In Hungary, the Czech Republic Slovakia, and Poland the recycling rate stood at about 34%-37% and in Croatia at 25%. Between 2012 and 2018, especially Poland and Slovakia increased their recycling rate by 22 and Slovenia by 17 percentage points. Although some progress has been achieved in the other CEECs as well, they still are below the 2020-target of 50% recycling rate laid down in the Waste Framework Directive[84] and the more ambitious revised targets for 2025 (55%), 2030 (60%) and 2035 (65%).[85] Because of variation in data collection and definition, the comparability of data is hindered even on the national level, while a comparison on a more disaggregated regional level is not possible yet. Poland strives to

[78] See https://ec.europa.eu/environment/circular-economy/index_en.htm
[79] https://europa.eu/rapid/press-release_IP-18-5_en.htm
[80] https://europa.eu/rapid/press-release_MEMO-18-3909_en.htm
[81] https://globalcompliancenews.com/eu-adopts-ban-certain-single-use-plastics-20190528/
[82] Although municipal waste accounts for only about 10% of total waste generated. See: https://ec.europa.eu/eurostat/statistics-explained/index.php/Municipal_waste_statistics
[83] Ibid.
[84] Directive 2008/98/EC
[85] Directive (EU) 2018/851, revised Waste Framework Directive.

set up a database recently. In Slovakia[86], the recycling rate of municipal rate ranged between 35% in the Eastern regions of Košice and Prešov and 41% in the more central region of Banska Bystrica in 2018. In the Bratislava region, the recycling rate was lower than the national average (35%). In the capital region, the amount of municipal waste (kg/capita) was second highest in the country (behind its neighbouring Trnavský kraj; the recovery rate (burning plus recycling plus composition) was also the second highest level (60%), behind Kosice in the East (62%).

Figure 39: Recycling rate of municipal waste, 2012 and 2018, % of total waste generated



Notes: Data for Ireland for 2017.
Source: Eurostat

Realizing a circular economy is yet at a primary stage and will require a long-term policy with involvement at all levels - from Member States, regions and cities, to businesses and citizens. Transnational co-operation is vital, as problems and waste are cross-national, cross-border and global. This became eminent as China

[86] Statistical Office of the Slovak Republic (2019), Our regions 2019.

announced to ban certain types of waste in 2017, which took effect on 1 January 2018. In fact, China became the world largest importer of waste since the 1980s and accounted for over half of global plastic scrap in 2017.[87]

3.7.2. Policy needs and potentials

The transition to a circular economy had made some promising progress, yet many further steps are needed. With the completion of the Circular Economy Action Plan in 2019, the EU set important legal frameworks for further development of the circular economy in the EU. Simultaneously, many EU Member States adopted national and partly also regional circular economy strategies. The main policy need is to put these into practice. For this, actions are needed like:

- Promoting circular design and production to minimise resource use and foster materials' reuse, recovery and recyclability (e.g. through capacity and knowledge creation)
- Raising consumer awareness to change consumption patterns
- Supporting waste management to recycle important resources or to turn waste into energy (e.g. via exchange of best practices)
- Supporting circular economy related research and investments by bringing together the relevant stakeholders
- Establishing circularity in new areas and sectors through strategy building processes, the creation of knowledge etc.
- Integration of circular economy aspects with other policies, e.g. related to innovation, business development, renewable energies or green-house gas emissions
- Promoting food waste prevention
- Promoting innovative waste management initiatives at urban level
- Enhancing green procurement by pooling the available experiences in central Europe
- Support the recycling, reuse and repair ecosystem, thus promoting also entrepreneurship
- Exploring the opportunities of the bio-economy to support economic development of rural areas, e.g. via the exchange of knowledge and pilot actions
- Support the development of remanufacturing, i.e. returning a used product to at least its original performance[88], to strengthen both, the circular economy and local economic development.
- Raising awareness and actively involving a broad range of stakeholders to allow for the creation of new ways of production, value creation, and consumption patterns

Transnational cooperation already has showcased its potential to contribute to the implementation of the circular economy and it is recommended to continue to do so. Linking up with European, but also national policies as well as integrating circular economy aspects with other policies or policy objectives (like PO1 "A smarter Europe") may be helpful to multiply and up-scale the transnational cooperation projects' results.

During the previous CENTRAL EUROPE Programme 2007-13, there were five transnational projects in the area of 'waste management and resource efficiency' (REC, 2014). Many aspects were covered, ranging from transboundary informal waste collection and shipment (TransWaste project), the setting-up of repair and re-use systems (CERRC – Central Europe Repair & Re-use Centres and Networks), improving packaging

[87] https://www.globalelr.com/2018/02/chinas-ban-on-waste-imports-upending-global-recycling-market/ (as of Feb 8,2018)
[88] https://www.remanufacturing.eu/about-remanufacturing.php

recyclability (ECOPAPERLOOP[89] – enhancing the quality of paper for recycling) and cleaner production. The ACT CLEAN[90] project supported SMEs throughout central Europe to implement eco-efficient production processes. RESOURCE project[91] promoted resource efficiency in SMEs in central Europe by promoting transnational incentive for eco-innovation.

In the current Interreg CENTRAL EUROPE Programme, three projects focus on the circular economy topic under the 'environment and culture priority'. CIRCE2020[92] - Expansion of the **CIR**cular Economy concept in Central Europe - aims to facilitate a larger uptake of integrated environmental management approach in five specific central European industrial areas by changing patterns from single and sporadic company recycling interventions to an integrated redesign of industrial interactions based on the concept of circular economy. STREFOWA[93] works on strategies to reduce food waste in central Europe. SURFACE[94] aims to improve environmental management and quality of life in functional urban areas through the establishment of multi-stakeholder based Smart Re-Use Parks.

3.8. NATURE PROTECTION AND BIODIVERSITY, GREEN INFRASTRUCTURE IN URBAN ENVIRONMENT AND REDUCING POLLUTION

3.8.1. The challenge

The EU's **2050 long-term strategy** drastically reviews the impacts of climate change based on the IPPC (2018) Report. The IPPC (2018) report analyses the climate change impacts at 1.5°C and 2°C, including the increase of extreme hot days, the sea level rise by 2100, the change to ecosystems, the amount on habitat loss, permafrost thawing, impacts on arctic oceans, on coral reefs or on water stress. Thus, one building block in the EU's 2050 long-term strategy aims to reap full benefits of the bio-economy and to create essential carbon sinks. It highlights the particular role of EU agriculture and especially forestry, i.e. for biomass, absorption of CO_2, biodiversity, soils and water resources. The EU's 2050 long term strategy also mentions the problems of cities. Cities host 360 million people, which make up 73% of Europe's population; they are responsible for 80% of Europe's energy consumption and 85% of the continents GDP.[95] As temperature rises and the number of hot days increases, cities are more affected as they suffer more from higher temperatures than surrounding areas, due to concentration of built environment – the so called 'heat island effect' (see also SO on climate change adaptation). Here, urban green spaces and green infrastructure can bring adaptation benefits and absorb emissions and pollution.

Biodiversity is a synonym for the variety of ecosystem, species and genes in a particular habitat. It has diverse functions (see wiiw, 2018) such as climate regulation, food protection, soil fertility and the production of food, fuel, figure and medicines. It is an important factor of for human wellbeing. However, there is a continuous loss of biodiversity witnessed in Europe, due to land use change and fragmentation (e.g. conversion into arable land, land abandonment, urban sprawl, expanding transport infrastructure and energy networks etc.), pollution, over-exploitation of natural resources (forests, oceans, rivers and soils), invasive

[89] http://www.ecopaperloop.eu/
[90] http://www.act-clean.eu/
[91] http://www.presource.eu/
[92] https://www.interreg-central.eu/Content.Node/CIRCE2020.html
[93] http://interreg-central.eu/Content.Node/STREFOWA.html
[94] https://www.interreg-central.eu/Content.Node/SURFACE.html
[95] See EU Commission (2018), based on HELIX - https://helixclimate.eu/

alien species as well as climate-change. The loss of biodiversity and ecosystems has social, environmental and economic consequences as well as health and socio-economic impacts,

Nature protection and maintaining biodiversity have long been policy goals of the EU. In April 1979, the EU adopted of the Birds Directive. It provides comprehensive protection to all wild bird species naturally occurring in the Union. In 1992, the Habitats Directive was adopted in order to help maintain biodiversity. It protects over 1000 animals and plant species and over 200 types of habitat. It also established the EU-wide Natura 2000 network of protected areas.[96] Natura 2000 'is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. It stretches across all 28 EU countries, both on land and at sea. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats.'[97]

The **EU Biodiversity Strategy to 2020**[98] was adopted in 2011 and aims to 'halt the loss of biodiversity and ecosystem services by 2020, to restore ecosystems in so far as is feasible, and to step up the EU contribution in averting global biodiversity loss' (headline target).[99] It is built around six targets: a) enhance the implantation of nature legislation (Birds and Habitats Directive), b) to maintain and restore ecosystems and establish green infrastructure, c) to increase the contribution of agriculture and forestry to biodiversity, d) to ensure the sustainable use of fishery resources, e) to combat invasive alien species and f) to step-up action to tackle the global biodiversity crisis. The mid-term review in 2015 has shown that no significant progress was made towards the 2020 headline target and 'biodiversity loss and degradation of ecosystem services in the EU have continued since the EU 2010 biodiversity baseline'.[100]

The EU has developed a **Green Infrastructure** Strategy in 2013, in order to meet Target 2 from the Biodiversity Strategy (see above). Green infrastructure is here defined as 'a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation'.[101] The strategy aims to **'**promoting investments in green infrastructure, to restore the health of ecosystems, ensure that natural areas remain connected together, and allow species to thrive across their entire natural habitat'.[102] Green infrastructure can be promoted in rural and urban areas, whereby green infrastructure is particularly important in urban environments. Here it shows particular positive health-related benefits, such as clean air, better water quality, reduction of noise, mitigation of extreme summer temperatures, it improves human wellbeing, combats social exclusion and isolation, and has positive psychological and emotional impacts.[103] Urban green infrastructure includes trees, parks, green roofs, gardens and urban forests, urban food production and community gardens.

The development of green infrastructure is also one way to reduce the negative effects of '**land take'**, i.e. the loss of undeveloped land to human-developed land, or the loss of agricultural, forest and other semi-natural and natural land to urban and other artificial land development, e.g. because of urban sprawl. As soil is a major natural resource, providing essential ecosystem services to humans (e.g. nutrient cycling, water

[96] https://ec.europa.eu/environment/nature/legislation/index_en.htm
[97] https://ec.europa.eu/environment/nature/natura2000/index_en.htm
[98] EU Commission, 2011.
[99] https://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm
[100] https://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm
[101] https://ec.europa.eu/environment/nature/ecosystems/index_en.htm
[102] https://ec.europa.eu/environment/nature/ecosystems/strategy/index_en.htm
[103] See European Commission (2013), Green Infrastructure (GI) – Enhancing Europe's Natural Capital, SWD(2013) 155 final.

purification, flood mitigation and climate regulation etc.), its protection has become a main goal of the European Union and led to setting a 'no net land take' by 2050 target in the EU Environment Action Programme to 2020 (7th EAP)

Pollution concerns various areas and may be related to air, soil and water (see SO on water management for the latter). In the field of air quality, the EU adopted a Clean Air Policy Package in 2013 (see wiiw, 2018). It includes a) national emission ceilings and reduction commitments from 2020 to 2030, b) a directive on medium-sized combustion plants, to limit emissions of nitrogen oxides, sulphur dioxides and particular matter and c) additional actions focusing on air quality in cities. In 2018, the Communication 'A Europe that protects: Clean air for all' was adopted that provides national, regional and local actors practical help to improve air quality in Europe. It also addresses urban areas, which are particularly affected by air pollution and pollution with ozone, dioxide and particular matter (PM) pose serious health risks.

Looking at land use and soil pollution issues, 'soil is not subject to a comprehensive and coherent set of rules in the Union. Existing EU policies in areas such as agriculture, water, waste, chemicals, and prevention of industrial pollution do indirectly contribute to the protection of soils.'[104] In 2006, the EU adopted a Soil Thematic Strategy with the aim to protect soils in the EU. However, in May 2014, the proposal for a Soil Directive Framework was withdrawn by the Commission. The 7th Environment Action Programme to 2020 from 2013, entering into force on 17 January 2014, makes mutual references to the protection of soil and recognises that soil degradation is a serious challenge (see wiiw, 2018).

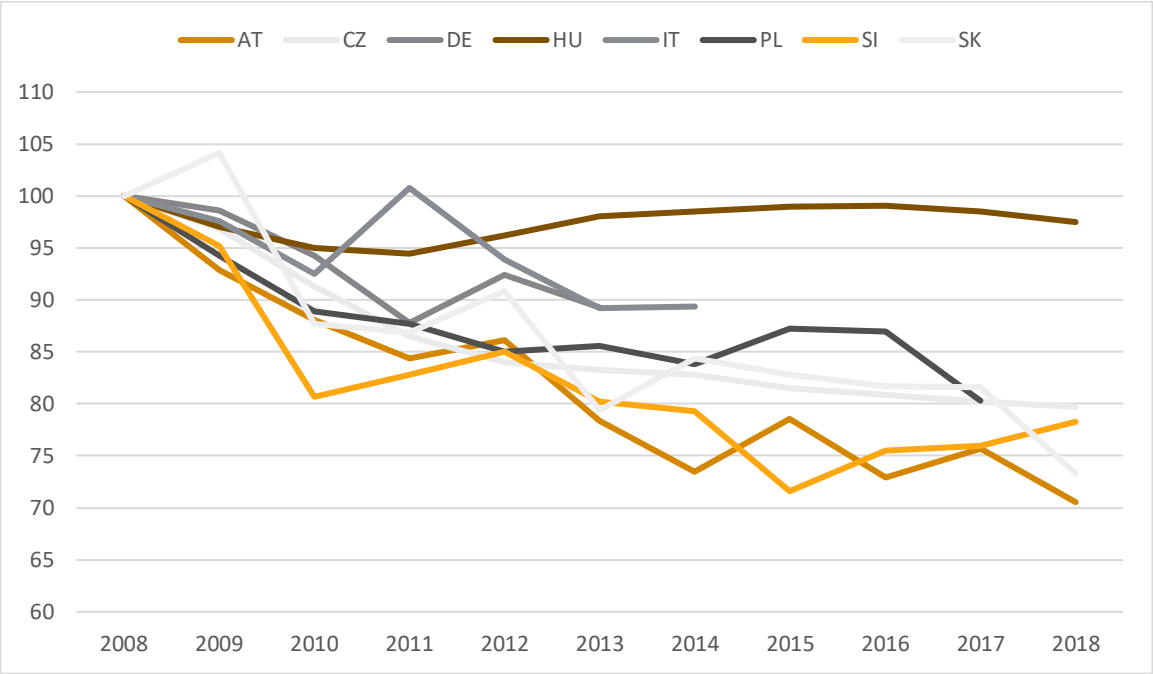
With enlargement of the EU in 2004 encompassing the countries of central Europe, also legislation of the Birds and Habitats Directive had to be amended as the EU Nature Directives had to be applied to a much larger territory than before. In fact, the new member states brought an 'amazing variety of habitats and wildlife to the EU, with species and habitat types that had nearly vanished from Western Europe'.[105] In addition, a new biogeographical region, the Pannonian region (South of Slovakia, Hungary) was added to the existing six listed in the Habitats Directive. Other biogeographical regions in the CE area include: Continental region (Germany, Poland, Czech Republic, North and East of Austria, North Italy, and the East of Slovenia), Alpine region (the West and Centre of Austria, North Italy, West Slovenia, West Croatia, and South of Germany as well as the Carpathian areas in North and East of Slovakia and the South of Poland) and the Mediterranean Region (Croatia and Italy with the regions at the Ligurian Sea). Today, the proportion of protected area under the Natura 2000 in the CE region is mostly above the EU average of 18%. In 2008 these shares amounted to 19% in Italy, 20% in Poland, 21% in Hungary and even 30% in Slovakia, 37% in Croatia and 38% in Slovenia. Only in three countries the share was below the EU-average: in the Czech Republic with 14% and in Austria and Germany with both 15%.[106]

Natural resources are much diversified in the central Europe region, with large areas of forested and agricultural land, mountainous areas, watercourses, coast with specific landscapes, the sea, plains, lakes and urbanised areas.[107] The diversity of natural heritage and the richness of biodiversity found here are big assets of the region. However, also here industrialisation, intensive agriculture, traffic and urbanisation as well as intensive tourism have negative impacts. Thus, maintaining natural resources and biodiversity is a main challenge. In Figure 40, the 'Common farmland bird index' in depicted, representing the status of biodiversity.

[104] https://ec.europa.eu/environment/soil/index_en.htm
[105] https://ec.europa.eu/environment/nature/legislation/enlargement/index_en.htm
[106] Eurostat database.
[107] See ÖIR (2012).

The index integrates the population abundance and the diversity of a selection of common farmland bird species associated with specific habitats. While in the EU-28, the index stabilised somehow between 2008 and 2018, in all CE countries, except Hungary, the index dropped strongly in that period.

Figure 40: Common farmland bird index, 2008 = 100

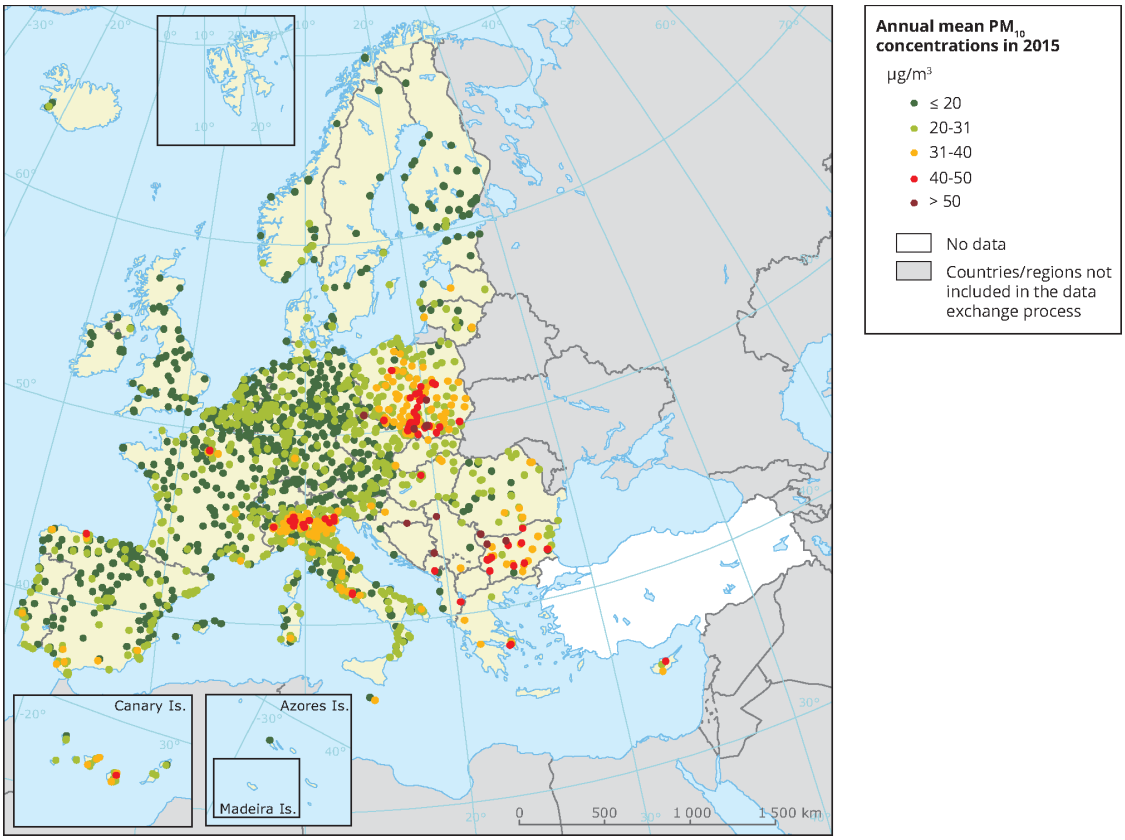


Notes: not for all countries all years available.
Source: Eurostat.

According to the EU's 7th Cohesion Report (European Commission, 2017), there are large differences among European cities in regards of access to green urban spaces. It states that in 'western, central and northern Europe, people have vast access to areas of green space. On the other hand, such spaces are less present in many eastern and southern EU cities'. As such, green urban spaces might be a challenge to the CE region. However, also differences among cities in the region can emerge. For example, the IDM Smart City Index 2019[108] includes a score (0-100) on the item 'green spaces are satisfactory'. While the score is at the lower end for Bratislava (34), Prague (46) and Budapest (47), in the middle for Rome (52), it is at a higher end for Berlin (68), Warsaw (72) and Vienna (75).

[108] https://www.imd.org/smart-city-observatory/Home/

Figure 41: Annual average particulate matter concentration, 2015



Source: European Environment Agency.

Air quality is of particular concern in cities, especially in the central Europe region. Figure 41 shows the annual average particulate matter concentration in 2015. In fact, the central Europe region is the most heavily affected by particulate matter in Europe. The highest concentration was measured in Poland, but also in Northern Italy and partly in Hungary. Strong pollution can be found in capital cities, such as Budapest (Hungary) and Bratislava (and also Košice in Slovakia).

Related to the topic of soil protection and land use, the Regional Environmental Center for Central and Eastern Europe (2014) states that soil sealing has specific characteristics in the CE region. On average, they have a lower percentage of land used for residential and economic infrastructure and services than the rest of Europe; but a higher percentage of land in these countries is used for agricultural purposes. Wiiw (2018) has shown that soil sealing is mostly an urban problem both within and outside the CE territory.

One important challenge and widespread problem in Central Europe as mentioned by the Regional Environmental Center for Central and Eastern Europe (2014) is soil contamination related to abandoned military, industrial and storage sites. Most frequent contaminants include heavy metals and mineral oil. Remediation has been taking place; however, progress was considered to be slow, capacities to deal with the problem rather limited, and thus they still pose a challenge to the region.

3.8.2. Policy needs and potentials

A neglected point regarding biodiversity is that eco-systems and the various species living in them form complex networks of interdependent relationships. Losing one species may endanger or unbalance the whole ecosystems thereby reducing their ability to provide valuable “ecosystem services” like purifying water and air, maintaining the soil, regulating the climate, recycling nutrients and providing food.

Thus, safeguarding bio-diversity is an important policy need by itself; linking it to topics like climate mitigation and adaptation, tourism, recreation and health (e.g. through the provision of green infrastructure in urban areas) makes it even more relevant for transnational cooperation. Therefore, we see the following potentials for transnational cooperation:

Biodiversity:

- Increasing public and stakeholder awareness and involvement
- Supporting and improving monitoring and reporting of biodiversity
- Exchanging and enhancing the knowledge of ecosystems and their services
- Linking rural development with biodiversity conservation aspects through the development of appropriate strategies
- Preserving agricultural genetic diversity, e.g. through pilot actions and awareness raising;
- Linking forestry with protecting and enhancing biodiversity through local strategies, awareness raising for forest owners etc.
- Improving the management of fish stocks including their habitats and ecosystems e.g. by exchanging best practices and experiences;
- Tackling issues related to invasive alien species

Air Pollution

The main creator of air pollution is the transport sector. Potentials to reduce transport related emissions are provided in the section on PO3 ‘A more connected Europe’. Besides transport there are a number of other transnational cooperation potentials:

- Improving the coordination of air quality governance[109], as the responsibility for abatement measures might be split between local, regional and national authorities
- Improving air quality modelling and monitoring
- monitoring
- Reviewing public management practices in dealing with air pollution
- Improve information for citizens about air quality (e.g. to reduce health risks)
- Reducing emissions from agriculture, industry, and households

Green infrastructure

- Improving spatial planning with respect to green infrastructure by adopting proactive approaches
- Integrating green infrastructure in spatial planning taking into account local needs and potentials

[109] https://www.eea.europa.eu/themes/air/improving-europe-s-air-quality

- Creating strategies and concepts jointly with local stakeholders to provide place-based tailored green infrastructure solutions
- • Enable local authorities and business to use green areas as a part of tourism-based development
- Support the Implementation of green infrastructure through a focus on recreation and health, e.g. via pilot projects
- Develop strategies to restore and enhancing high-quality wetland environments
- Developing decision support software tools for biodiversity and ecologically based land use planning that includes economic analysis options
- Increasing the number of green roofs and green walls, e.g. through awareness raising, pilot actions e.g. on public buildings etc.
- Raise awareness of the benefits and challenges of green infrastructure.
- Combining private and public funding mechanisms for green infrastructure implementation.
- Facilitating cooperation between actors, e.g. of different levels of government but also of interdisciplinary teams of professionals supporting green infrastructure development.

During the previous Interreg CENTRAL EUROPE Programme 2007-13, the HABIT-CHANGE project aimed at evaluating, enhancing and adapting existing management and conservation strategies in protected sites to pro-actively respond to climate change treats to habitat integrity and diversity. THE SALVERE project focussed on semi-natural grassland as a source of biodiversity improvement, and TransEcoNet on the development, management and protection of transactional ecological networks in central Europe.[110] In addition, the Urban Heat Island (UHI) Project[111] , aimed at developing mitigation and risk prevention and management strategies concerning urban heat island phenomenon. Pilots were carried out in 8 of the most relevant metropolitan areas and MEGAs (Mega Urban Regions) of central Europe: the metropolitan cluster of Bologna – Modena, the urban corridor of Venice – Padua, Wien, Stuttgart, Lodz & Warsaw, Ljubljana, Budapest and Prague.

In the current Interreg CENTRAL EUROPE Programme, specific objective 3.1 aims to improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources. It includes a range of projects focusing on biodiversity and the conservation of habitats, including topics such as the sustainable management of protected areas and the transnational monitoring as well as protection of lynx populations. Four projects deal with biodiversity and habitats (3Lynx, CEETO, Centralparks, MaGICLandscapes), one with air quality (InAirQ) and two with forests. For example, the main objective of SUSTREE is the promotion of climate change adaptation of forest ecosystems by fostering and enabling transnational adaptive management of forest genetic resources.

Furthermore, specific objective 3.3 focuses on improving the quality of the environment in functional urban areas (FUAs). Challenges such as sustainable land use including the rehabilitation of brownfield sites, air pollution, waste management, prevention and reuse, resource efficiency (including food waste), as well as urban groundwater management and integrated management of urban green spaces are tackled in projects. For example, the SALUTE4CE project[112] aims to protect and develop natural resources through increasing the capacities of public sector, and related entities, to improve an integrated environmental management of green

[110] See Regional Environmental Center for Central and Eastern Europe (2014).
[111] http://eu-uhi.eu/
[112] https://www.interreg-central.eu/Content.Node/SALUTE4CE.html

and blue infrastructure in Functional Urban Areas (FUAs). The project will encourage the planting of native and climate resistant vegetation in areas lacking large sites for this function and using the small plots/spots which are not attractive for other purposes. The UGB (Urban Green Belt) project[113] has partners from 7 central Europe countries and will develop innovative methods and tools (based on applying green infrastructure, community involvement and multi-level governance concepts) leading to integrated models for managing urban green spaces smartly.

3.9. SUSTAINABLE MULTIMODAL URBAN MOBILITY

3.9.1. The challenge

The EU's **2050 long-term strategy** highlights clean, safe and connected mobility as a building block for meeting the vision in 2050. It particularly mentions urban areas and smart cities as first centres of innovation in mobility. Changes in mobility will include city planning, safe cycling and walking paths, clean local public transport, the introduction of new delivery technologies such as drones, mobility as a service, advent of car and bike sharing services. Together with transition to carbon-free transport technologies this will reduce air pollution, noise and accidents and will improve the quality of urban living.

The EU aims to 'improve the quality of life in cities by promoting active mobility solutions, such as walking and cycling, and by ensuring good accessibility for residents and commuters. It works with cities and regions to develop a sustainable urban mobility policy, including efficient public transport systems and good connectivity throughout their home country.'[114] In 2013 the **Urban Mobility Package** was adopted. It supports measures in the area of urban transport by (a) sharing experiences, show-casing best practices, and fostering cooperation, (b) providing targeted financial support, (c) focusing research and innovation on delivering solutions for urban mobility challenges, and (d) involving the member states and enhancing international cooperation.[115] It sets out the concept of Sustainable Urban Mobility Plans (SUMPs), which considers the functional urban area – defined as a city plus its commuting zone – and proposes that action on urban mobility is embedded into a wider urban and territorial strategy.[116]

In Central Europe the degree of urbanisation is lower compared to the EU-average. In the EU, about 75% of population lived in cites and urban areas (i.e. towns and suburbs) in 2015. Only in Germany and Italy this share was much larger with 80% and 83% but lower for all other countries in the region. It ranged between 68% in Hungary, 66% in the Czech Republic on the hand to only 60% in Slovenia and Slovakia on the other. More than 35% of the population lived in rural areas in Austria, Croatia, Poland, Slovenia and Slovakia.[117] Although urbanisation is lower urban mobility poses a larger challenge in the CE region. This is evidenced by various trends: For example, while car ownership in cities is generally lower than the country-average in capital cities, the exceptions include Bratislava, Budapest, Prague, Rome and Warsaw.[118] Thus it is no surprise that in these cities traffic congestion poses a major problem. The IDM Smart City Index 2020[119]

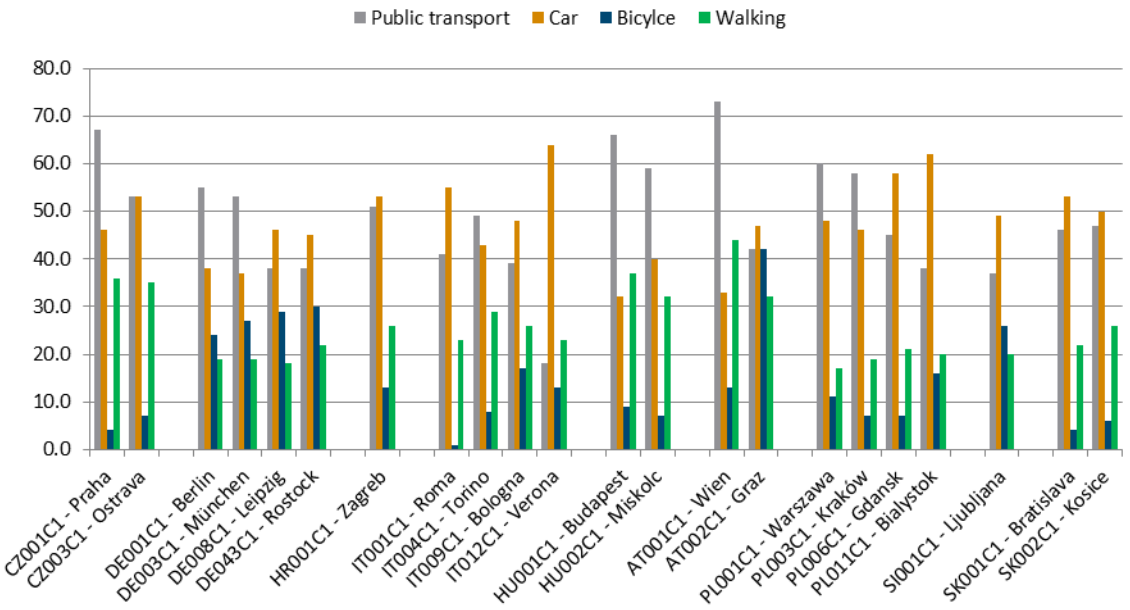
[113] https://www.interreg-central.eu/Content.Node/UGB.html
[114] https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/priority-themes-eu-cities/urban-mobility_en
[115] https://ec.europa.eu/transport/themes/clean-transport-urban-transport/urban-mobility/urban-mobility-package_en
[116] See European Commission (2013), Together towards competitive and resource-efficient urban mobility, COM(2013) 913 final.
[117] See European Commission, JTC (2017).
[118] See European Commission, UN-Habitat (2016).
[119] https://www.imd.org/smart-city-observatory/Home/

includes a score (0-100) on the item 'traffic congestion is not a problem'. It shows the lowest score (18.6), thus the highest problem in Bratislava, Prague (21.6), Budapest (29.5), Warsaw (30) to Berlin (31) and at slightly better value for Vienna (40). In order to ease the traffic situation, Bratislava, for example, is currently building a bypass and also planning a new parking policy coming into effect in 2021.[120]

The European Cities Report 2016 sees pronounced difference in trends of public transport use in western EU cities and those in the Central European Region. It states that 'improvements in the quantity and quality of public transport services combined with low fares led to considerable growth in public transport use in western EU cities over the past few decades'.[121] It sees less favourable trends in Central Europe, showing an increase of passenger kilometres for tram and metro but a decrease of bus and rail since 1995. It notes, however, that improvements can be seen in some cities, referring for example to Prague.

Overall, the accessibility of public transport is better in larger cities compared to medium-sized cities (see European Commission, 2017). Looking at some cities from the central Europe region in Figure 42, the main means of transport primarily used in capital cities is public transport. 50 to 70% of respondents use public transport there, with the highest rate in Vienna (73%) and the lowest one in Ljubljana (37%). Despite the better availability of public transport in capital cities, cars are more used in Zagreb, Ljubljana and Bratislava. The share of people using the bicycle is highest in Berlin (24%) and Ljubljana (20%). Walking, as another option of urban mobility, is used by a higher share of people in Vienna (above 40%), but also in Czech and Hungarian cities (above 30%).

Figure 42: Means of transport primarily used to go to work/training place, 2015, in %,



Source: Eurostat Public Perception Survey.

[120] https://spectator.sme.sk/c/22199372/petrzalka-ruzinov-and-other-bratislava-boroughs-are-launching-pilot-parking-projects.html from 22 August 2019.
[121] See European Commission, UN-Habitat (2016), page 125.

3.9.2. Policy needs and potentials

There is a partial overlap of this specific objective with PO3 “A more connected Europe” as transport is one main emitter of CO2 and green-house gases. Thus, the expansion of sustainable urban mobility is a major policy need given its positive effects on the environment, health, energy efficiency and standard of livings.

Correspondingly, the policy potentials are similar, too and include:

- The promotion of an efficient and sustainable use of the existing infrastructure via awareness raising, capacity building and digital information tools
- Promote a shift to the least polluting and most energy efficient modes of transport
- Maintaining or improving the quality of urban transport infrastructure in terms of safety but also climate and disaster resilience
- Making use of technological innovations to improve ecological sustainability of urban transport
- Promoting environmentally friendly transport modes like walking, cycling and public transports.
- Strengthening the role of multimodal nodes, e.g. integrating of bike&ride and park&ride, the accessibility by bike and for pedestrians, the quality of waiting rooms and the available information are important factors to trigger a shift from car use to public transport.
- Improve the quality and efficiency of public transport, by a) coordinate planning between different stakeholders and authorities, e.g. in a functional urban area context, b) improve marketing and pricing schemes, c) introducing intelligent transport systems to provide information to passengers etc.
- Improve the accessibility for elderly and disabled people
- Improve intermodal transport aiming for seamless integrated transport chains, including door-to-door information and ticketing, smooth interchanges at train and bus stations, integration of long distance and regional transport with the “last mile urban trip”.
- Improve mobility management to promote the use of sustainable transport modes, including awareness raising activities.
- Support the shift to clean and energy-efficient vehicles.
- Modernise urban freight and logistics by improving e.g. transportation methods, handling and storage of goods, management of inventory, waste and returns, as well as home delivery services.
- Improve traffic and demand management, e.g. improving the flow of traffic, introduce parking management, reallocating urban space in favour of sustainable modes, using congestion charging, establishing low-emission zones etc.

During the previous Interreg CENTRAL EUROPE Programme 2007-13, the project GUTS aimed to contribute to sustainable urban mobility in central Europe, helping cities and urban agglomerates to prepare the ground for innovative clean investments, with a transnational strategy on clean public transport and regional action plans. The REZIPE project aimed to reduce emissions of CO_2 and NO_x and fine dust by intruding zero emission vehicles in urban environments.[122]

In the current Interreg CENTRAL EUROPE Programme 2014-2020, under the low-carbon priority SO 2.3[123] aims to improve capacities for mobility planning in functional urban areas to lower CO2 emissions. The funded projects focus on smart solutions for low emission zones (SOLEZ) and low carbon mobility policies in functional urban areas (LOW-CARB, MOVECIT, SMART COMMUTING.) Furthermore, they tackle cleaner

[122] See Greenovate (2014).
[123] https://www.interreg-central.eu/Content.Node/Low-Carbon.html

freight transport (SULPiTER) and improved mobility for passengers travelling to/from the airports (LAira). Out of these projects, for example, SMART COMMUTING, will foster a coordination structure at functional urban area level involving municipalities of surrounding territories and public transport companies. It targets the rate of daily commuters still using cars instead of more sustainable means of transport.

4. A MORE CONNECTED EUROPE (PO3)

4.1. INTRODUCTION

From the beginning, the European Single Market has been characterised by 'four freedoms' originating in the Treaty of Rome in 1957, i.e. the free movement of goods, services, people and capital. Appropriate transport infrastructure is a precondition for fulfilling the former three, providing physical access to foreign markets for goods, services and labour. These markets as well as transport infrastructure itself might change substantially in the near future through digitalisation.

The backbone for intra-European transport is the so-called core Trans-European Transport Network (TEN-T), complemented by a farther reaching comprehensive network. Both the core and the comprehensive European transport network face major social, environmental and economic challenges. The need for sustainable transport, particularly with respect to climate change, is underlined in the Commission's communication "A clean planet for all"[124]. It also ought to be climate resilient and secure. In particular, modal shifts of transport from road and air towards rail and waterways might contribute to achieving multiple goals. Successful modal shifts, however, require a functioning intermodal network that is working across regions and national borders, which might be supported by intelligent solutions involving information and communications technology.

The analysis of transport related challenges is structured according to the Specific Objectives for a more connected Europe and includes:

- Enhancing digital connectivity;
- Developing a sustainable, climate resilient, intelligent, secure and intermodal TEN-T;
- Developing and enhancing sustainable, climate resilient, intelligent and intermodal national, regional and local accessibility, including improved access to TEN-T and cross-border mobility.

4.2. ENHANCING DIGITAL CONNECTIVITY

4.2.1. The challenge

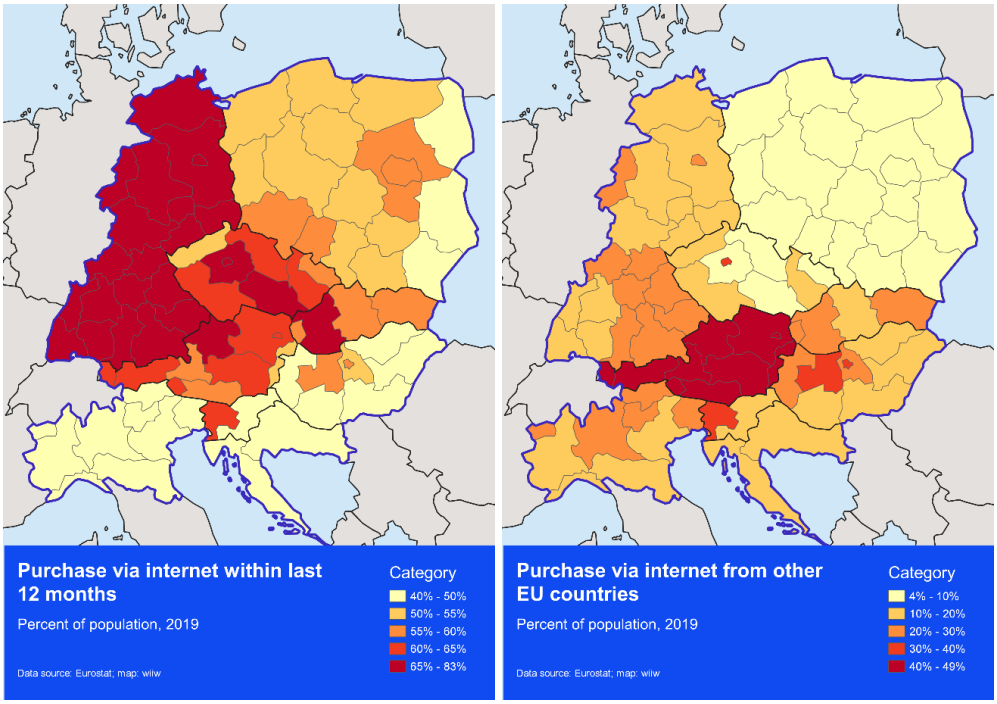
The Specific Objective of enhancing digital connectivity in central Europe is closely linked with the Specific Objective of reaping the benefits of digitisation for citizens, companies and governments in PO1 "A smarter Europe". The evolution of information and communication technology (ICT) affects all aspects of economic life[125]. Inter alia, ICT solutions are crucially important in promoting the shift towards more sustainable transport through the provision of information, smoothening of trans-border and multimodal transport, as will be shown in the following sections. Furthermore, digitalisation results in new products and services throughout economic sectors, and affects processes along international value chains, but also the way how people work, as well as from where they do work.

[124] European Commission (2018)
[125] See also the special section devoted to PO1 "A smarter Europe".

The EU has worked towards the Digital Single Market[126], with some major achievements but also prevailing burdens. Out of 30 legislative initiatives presented by the Juncker Commission, 28 have been politically agreed or finalised by 2019. Some recent success stories include the ending of roaming charges in June 2017, access to online subscriptions while travelling within the EU since April 2018, new rules against unjustified geo-blocking since December 2018 or the EU Cybersecurity Act entering into force in June 2019. New rules making it easier to sell audio-visual content across borders will apply by 2020. Work is still ongoing for higher transparency and new regulations to facilitate cross-border parcel delivery (which currently constitute a problem for a majority of companies wishing to sell their products abroad), storing and processing of non-personal data and countering the dissemination of disinformation[127].

Burdens of the incomplete Digital Single Market affect small and medium-sized enterprises (SME) disproportionately. Within the central Europe region, the share of companies (both SME as well as large corporations) selling abroad is above EU average for Austria, the Czech Republic, Germany and Slovenia, while the remaining central Europe economies fall far behind[128]. The picture looks quite similar from the angle of buyers, with the southernmost and easternmost regions in central Europe being associated with the lowest shares of individuals having purchased via the internet within the last 12 months (Figure 43, left panel). The lowest shares for online purchases from other EU countries are found for Poland, northern regions of the Czech Republic and eastern regions of Hungary.

Figure 43: Purchases via internet in total and from other EU countries, 2019

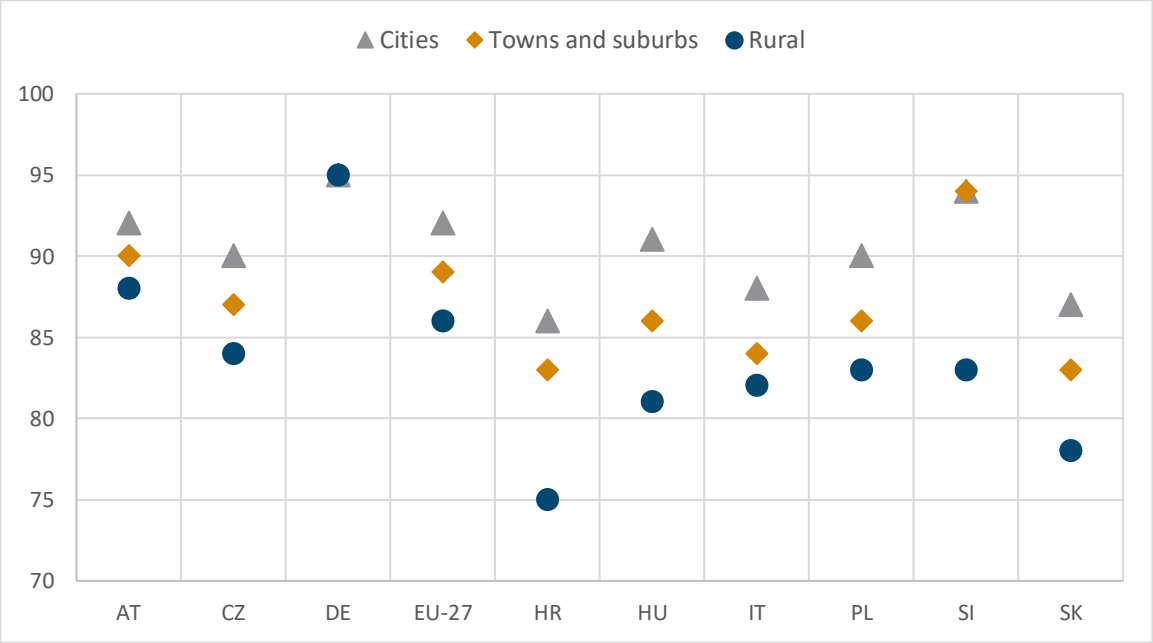


Source: Eurostat [isoc_r_blt12_i, updated 3 July 2019]; Map: wiiw

[126] See: European Commission (2010b): A Digital Agenda for Europe; European Commission (2015): A Digital Single Market Strategy for Europe.
[127] European Commission (2019b)
[128] Römisch et al. (2018), p. 26 ff

Although 89% of all households in the EU have access to the internet, there are sizeable differences across and within countries. With the exceptions of Austria, Germany and Slovenia (except its rural areas), all central Europe countries perform below EU average. With shares of 87% the Czech Republic is close, though. Gaps between urban and rural areas within central Europe are biggest in Croatia, Hungary and Slovakia (Figure 44).

Figure 44: Internet access in households by degree of urbanisation, 2019, in % of total households

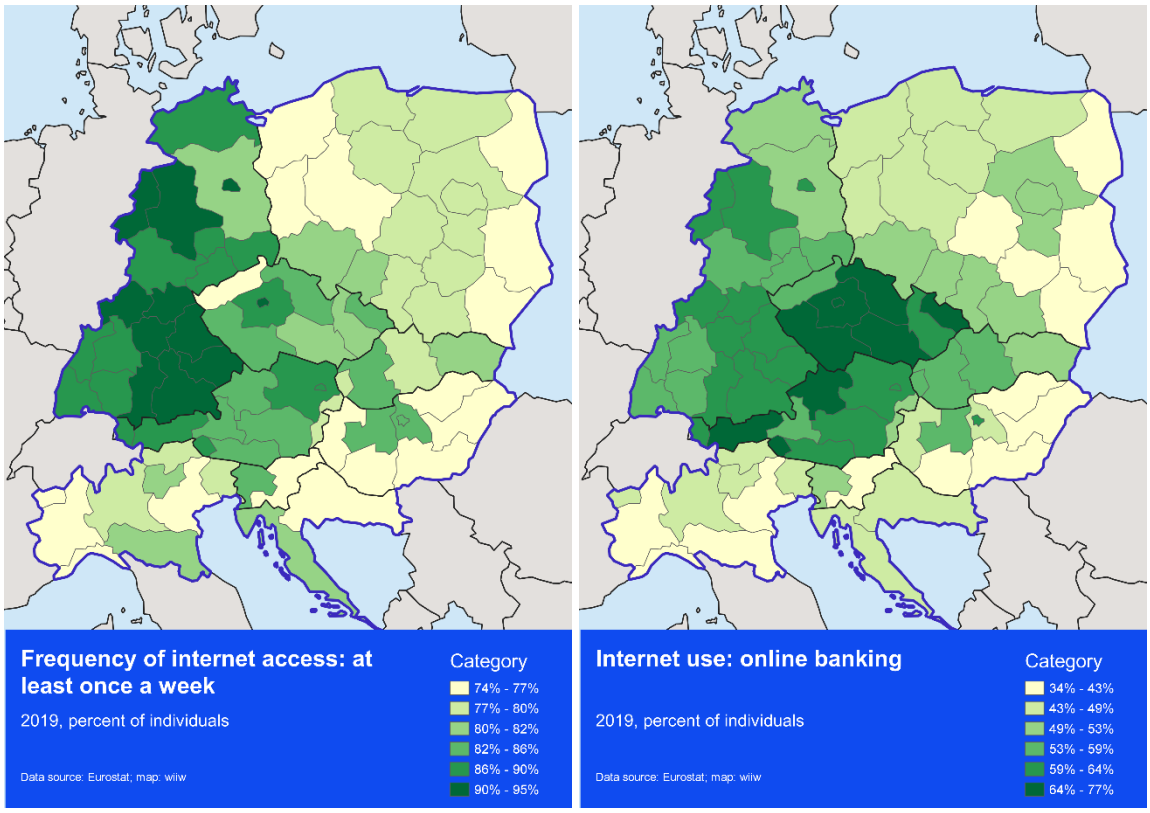


Source: Eurostat [isoc_ci_in_h]; Diagram: wiiw

While statistics on internet access for Poland resemble those of Italy and the Czech Republic, actual internet use is relatively low in some of its south-eastern regions. Overall, people in central Europe regions in Germany, the Czech Republic, western Slovakia and Austria use the internet most frequently (Figure 45).[129]

[129] Figures on the frequency of internet use fit nicely the statistics on online purchases and internet banking, it is not closely related to other uses of the internet, such as the participation in social networks or civic/political participation.

Figure 45: Differences in the frequency of internet access and online banking activities persist



Source: Eurostat [isoc_r_iuse_i, updated 3 July 2019]; Map: wiiw

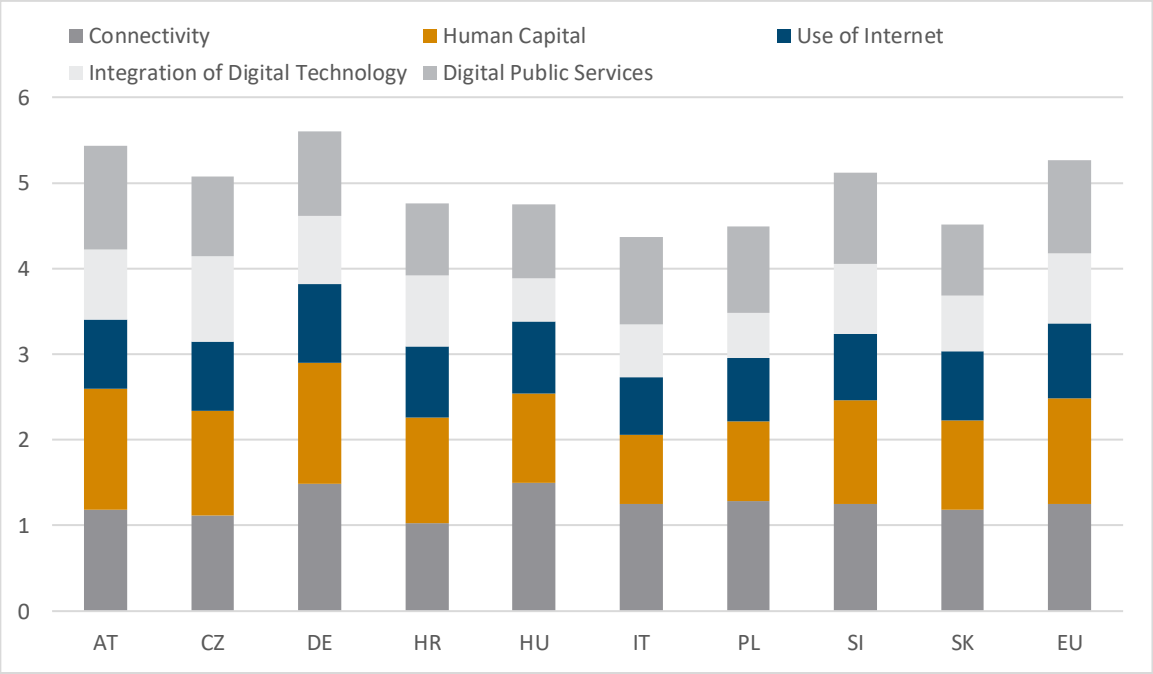
ICT infrastructure, in particular broadband services and its speed, is captured by the connectivity dimension of the Digital Economy and Society Index (DESI). Within CE, Germany, Poland, Slovenia and Hungary perform better than the EU average. Regarding the skills needed to benefit from digitalisation and the use of internet services by citizens, only Germany shows a higher than EU average score. Relatively large differences among CE countries are found regarding the integration of digital technology by businesses, with lowest figures found for Hungary (0.51), Poland (0.52) and Italy (0.62) and highest for Slovenia (0.82), Germany (0.83) and the Czech Republic (0.99). However, the dimension with the potentially biggest leverage for transnational cooperation concerns digital public services, focusing on e-government and e-health, already introduced in the chapter on PO1 “A smarter Europe”.

Another important yet underrepresented field for future transnational cooperation is cybersecurity. The Directive on security of network and information systems (NIS) entered into force in August 2016, with EU members having had time to translate the directive into national law by November 2018. In addition, the Cybersecurity Act entered into force in summer 2019, aiming to reinforce cooperation against cyber-attacks, which have increased by 300% since 2015[130]. The CEF currently finances a ‘Cyber Exchange’ action, fostering cooperation among ten Member States (including Austria, Croatia, the Czech Republic, Poland and Slovakia within CE) in the field of cybersecurity. Transnational cooperation is essential given the scale, nature,

[130] European Commission (2019b)

and cross-border effects of cyber-attacks. The CEF initiative indicates that even in the field of cybersecurity regional exchange is fruitful; yet the biggest leverage can be expected from EU-wide actions and standards.

Figure 46: Dimensions of the Digital Economy and Society Index, 2019



Source: Digital Economy and Society Index (DESI) 2019; Diagram: wiiw

4.2.2. Policy needs and potentials

Following the analysis, the main policy need for central Europe is to ensure good digital connectivity for all regions, particularly in rural areas. Foremost, this depends on infrastructure development. However, it is questionable to what extent transnational cooperation can reasonably contribute to the extension and upgrading of digital infrastructure, as connecting regions, towns and villages is a task for national internet providers. Studies on how to improve internet access, increase the use of the internet by households and businesses, particularly in countries with large differences between rural and urban areas such as Slovakia, Hungary and Croatia, as well as on remaining barriers to cross-border transactions may help in setting policy priorities. In addition, there are potentials for transnational cooperation in exchanges of best practices on cybersecurity, contributing to the EU discourse, and in the development of digital services, especially related to e-government, e-health or e-culture. The respective transnational policy potentials have already been discussed in PO1 ‘A smarter Europe’ and are therefore not repeated here.

4.3. DEVELOPING A SUSTAINABLE, CLIMATE RESILIENT, INTELLIGENT, SECURE AND INTERMODAL TEN-T

4.3.1. The challenge

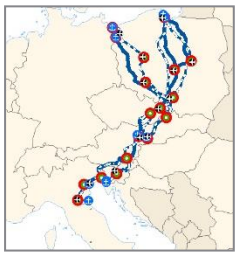
Expectations on an optimal transport system are manifold and challenging. It should provide fast, cost-efficient, and simultaneously environmentally friendly and low-carbon multimodal transport of goods and passengers throughout a Single European Transport Area, which is supported by the EU through investments in the Trans-European Transport Network (TEN-T).

The TEN-T consists of nine corridors – covering multiple modes of transport such as railways, roads, inland and maritime shipping routes – which should be completed by 2030[131]. The central Europe region is characterised by many corridor intersections[132]. Five corridors connect at least three economies of the central Europe region (Table 1).

Table 1: TEN-T corridors by central Europe country

TEN-T corridors	AT	CZ	DE	HR	HU	IT	PL	SI	SK	CE total
Baltic-Adriatic	●	●				●	●	●	●	6
Rhine-Danube	●	●	●	●	●				●	6
Orient/East-Med	●	●	●		●				●	5
Mediterranean				●	●	●		●		4
Scandinavian-Mediterranean	●		●			●				3
North Sea-Baltic			●				●			2
Rhine-Alpine			●			●				2
Atlantic			●							1
North Sea-Mediterranean										0
Number of corridors	4	3	6	2	3	4	2	2	3	

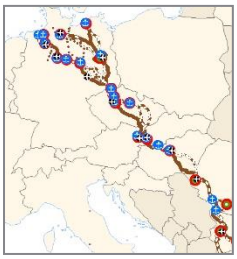
Source: wiiw, based on DG MOVE (https://ec.europa.eu/transport/themes/infrastructure/ten-t_en).



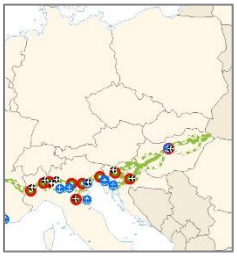
Six central Europe countries are located along the **Baltic-Adriatic corridor**. According to DG MOVE, it is one of the most important trans-European road and railway axes. Key railway projects include two tunnels in Austria, i.e. the Koralm Base Tunnel (to be operational by 2023) and the Semmering Base Tunnel (to be operational by 2026). Further bottlenecks concern central Europe cross-border sections, which require improved cooperation.

[131] DG MOVE provides descriptions of each corridor, information about European coordinators, success stories, missing links and projects funded by the Connecting Europe Facility: https://ec.europa.eu/transport/themes/infrastructure/ten-t_en
[132] Maps accompanying the following corridor descriptions are excerpts from the interactive TENtec map, provided by the European Commission, EC-GISCO and EuroGeographics (2018).

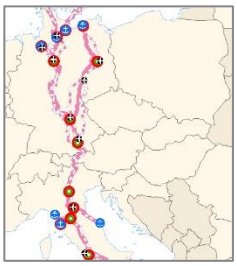
The **Rhine-Danube corridor** spans over six central Europe countries as well. Two branches of the corridor form the main east-west link across the mainland EU. Contrary to what the name of the corridor might suggest, main bottlenecks arise through missing cross-border rail links, e.g. between Germany, Austria and the Czech Republic. Furthermore, efforts in cross-border matching of connections between the Rhine River, the Rhine-Main-Danube Canal and the Danube River are considered essential to make inland waterways attractive for freight transport. The CEF-funded project "FAIRway Danube" (lasting until June 2020) – covering Austria, Slovakia, Hungary and Croatia within the central Europe region – is an example of successful cross-border cooperation in implementing a harmonised waterway monitoring system, aiming at making navigation safer and more reliable.



Projects along the **Orient/East-Med corridor** target five central Europe countries. Developing ports to multimodal logistics hubs and linking economic centres in central Europe to the "Motorways of the Sea"[133] is at the core of the Orient/East-Med corridor. Many sections still require the implementation of cross-border traffic management systems for railway connections and inland waterways, with the Elbe River being a key waterway along this corridor.



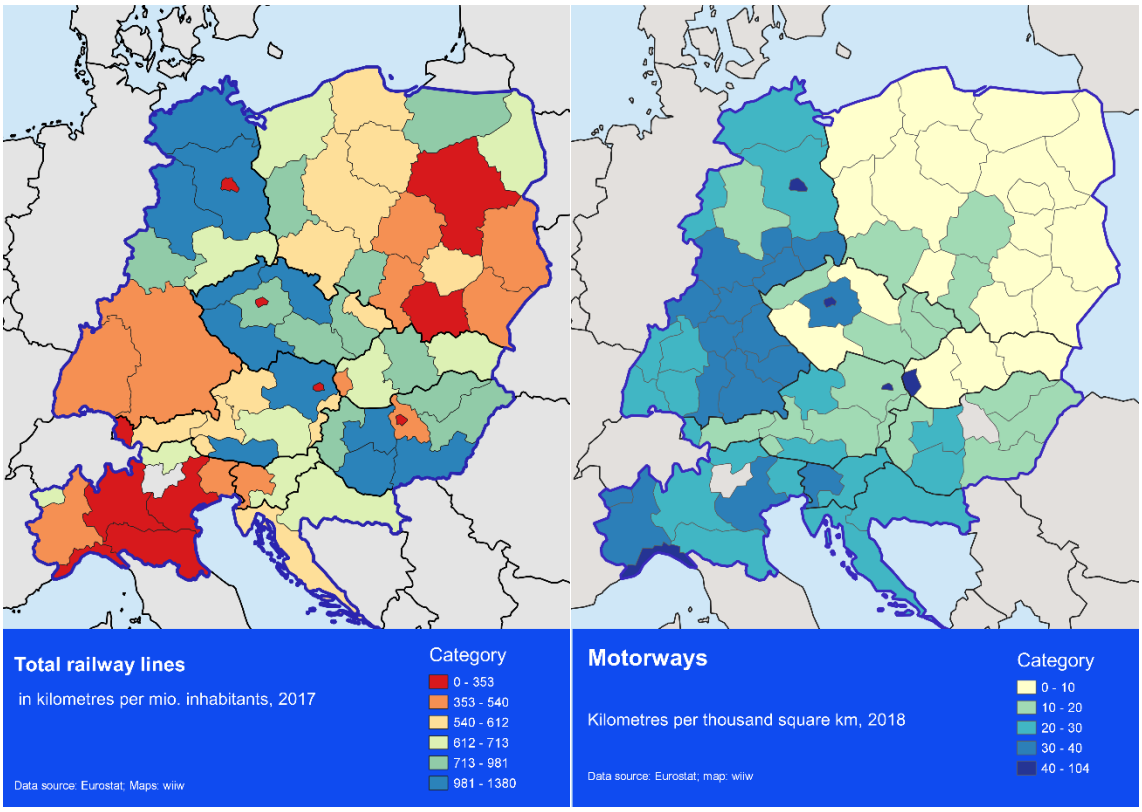
Four central Europe countries lie on the **Mediterranean** corridor, primarily consisting of road and rail networks, linking ports of the Western Mediterranean with central Europe. A priority constitutes the modal shift from road to rail in sensitive environments like the Pyrenees and the Alps. For the central Europe region, challenges include the full integration of Croatia into the transport network and the removal of bottlenecks in cross-border sections between Slovenia, Croatia and Hungary.



On the western edge of the central Europe region, the **Scandinavian-Mediterranean** corridor represents an important north-south axis, running through three central Europe countries. Among the most significant projects are the Fehmarnbelt Fixed Link – an immersed rail and road tunnel connecting Denmark and Germany to be operational by 2028 – and the Brenner Base Rail Tunnel, removing the cross-border alpine transport bottleneck between Munich and Verona by 2026.

[133] The concept was introduced in White Paper of the European Commission (2001): European transport policy for 2010: time to decide and aims at reducing road congestion and shifting freight to sea-based logistical routes, which requires also the better use of rail and inland waterways connecting maritime ports. The European Rail Traffic Management System (ERTMS) and the Motorways of the Sea (MoS) are two horizontal priorities complementing the core TEN-T network. A sketch of the Motorways of the Sea is provided by the Commission: https://ec.europa.eu/transport/sites/transport/files/modes/maritime/doc/motorways_sea_2004_07_30_map.pdf

Figure 47: State of motorway infrastructure density, 2018



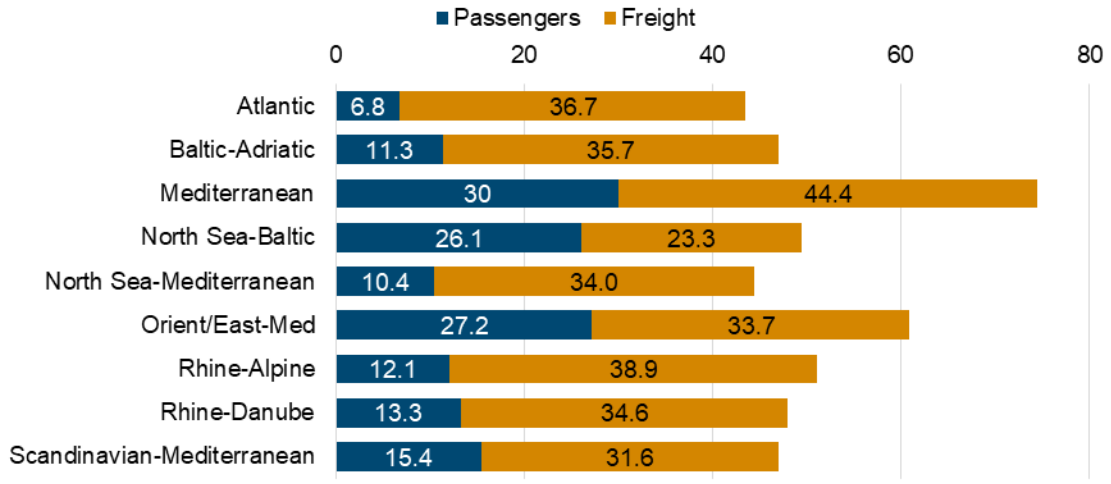
Source: Eurostat [tran_r_net, updated 20 May 2019].

Figure 47 gives an indication of the regional rail and motorway network density per capita, yet, does not account for the condition and capacities of the existing network. In its Transition Report 2017-18 the European Bank for Reconstruction and Development (EBRD) estimated the infrastructure investment need for the period 2018-2022 in percent of annual GDP. For the transport sector it amounts to 4.4% for Hungary, 3.4% for Croatia, 2.8% for Slovenia, 2.6% for Poland, 1.8% for Slovakia and 1.5% for the Czech Republic, predominantly being associated with the need for replacement and maintenance[134].

An impact assessment for the TEN-T network by Schade et al (2018) expects travel time by rail for passengers to reduce by 11.3% for the Baltic-Adriatic corridor, 13.3% for the Rhine-Danube corridor, 15.4% for the Scandinavian-Mediterranean corridor, 27.2% for the Orient/East-Med corridor and 30% for the Mediterranean corridor upon completion[135]. Predicted time savings for freight transport are even bigger, with anticipated time savings of more than 30% for all corridors except the North Sea-Baltic corridor (Figure 48)[136].

[134] EBRD (2017)
[135] In comparison to the baseline scenario, assuming zero TEN-T investments after 2016.
[136] Regional time and distance related trade costs were recently computed by Persyn et al (2019). Policy simulations find that within CE, a 20% increase in fuel prices would hit Poland, the Czech Republic, Slovakia, Hungary and Croatia particularly hard. Using transport infrastructure investments within the Cohesion Programme 2014-2020, they find the by far biggest reductions in transport costs for regions in Poland, the Czech Republic and Hungary, both within as well as across regions.

Figure 48: Expected time savings in travel time by rail resulting from TEN-T investments



Source: Schade et al. (2018), p. 17. Diagram: wiiw.

4.3.2. Policy needs and potentials

Based on the analysis one may conclude that there is still room for improvements of the TEN-T network in central Europe. Correspondingly, there is also room or need respectively for the Interreg CENTRAL EUROPE Programme to further develop and complement the TEN-T network.

Potentials to use the transnational cooperation policy toolkit of a) developing strategies, tools and pilot actions, b) exchanging knowledge and best practices and c) building national, regional and local capacities may emerge in a number of TEN-T related areas like:

- Reducing infrastructure quality gaps
- Improving the interconnection and interoperability of TEN-T networks through developing, improving, revising or cross-border coordinating existing transport strategies and plans
- Removing bottle-necks in TEN-T infrastructure, through joint planning activities
- Integrating and interconnecting the different transport modes
- Promoting the efficient use of infrastructure, e.g. by avoiding traffic congestions
- Introducing innovative technological solutions to make transport safer, more efficient and environmentally more sustainable
- Ensuring infrastructure resilience to climate change, natural and man-made disasters
- Planning of new infrastructure

The capacity to do so has been demonstrated in a number of projects, like the Interreg CENTRAL EUOPE 2007-2013 BATCo, SoNorA and Via Regia projects or the 2014-2020 CORCAP project. Notably, the 2007-2013 projects prepared large-scale investments financed by the EU Cohesion fund or other funds, thereby

showing the enormous up-scaling potential of transnational cooperation in this area. Furthermore, transnational cooperation can contribute to the evaluation[137] process of the TEN-T.

4.4. DEVELOPING AND ENHANCING SUSTAINABLE, CLIMATE RESILIENT, INTELLIGENT AND INTERMODAL NATIONAL, REGIONAL AND LOCAL ACCESSIBILITY, INCLUDING IMPROVED ACCESS TO TEN-T AND CROSS-BORDER MOBILITY

4.4.1. The challenge

The title of the chapter and hence the Specific Objective indicates that this objective is very comprehensive in terms of topics addressed. To keep the analysis and interpretation manageable we concentrate our analysis on the most relevant topics, which are

- Connecting central Europe
- Sustainable and climate resilient mobility
- Safe mobility
- Intermodal and intelligent mobility and freight transport

Connecting central Europe

In order for transport and regional policy to be inclusive, it needs infrastructure and respective services connecting all regions. This in turn requires a transport network and related transport services linking peripheral regions to the core TEN-T network. In particular, it is crucial to improve regional and local accessibility and to connect rural areas to major cities and agglomeration areas within central Europe.

While the finalisation of the core TEN-T network is scheduled for 2030, the farther-reaching comprehensive Network is planned to be completed by 2050. The comprehensive network is particularly important for regions and countries with fewer core TEN-T links and big rural and suburban areas, where people tend to be at greater risk of poverty and social exclusion. Within central Europe, Croatia, Poland and Slovenia are connected to only two core TEN-T corridors; the Czech Republic, Hungary and Slovakia to three (Table 1).

Although the improvement of cross-border sections is often emphasised within the core TEN-T framework, many missing trans-border links or services are found outside of the core – and partly even outside the comprehensive – network. The project “Mind the Gap”[138] initiated by Michael Cramer of the Greens/EFA in the European Parliament analysed 250 trans-border connections within the EU and highlighted 15 most promising regional cross-border tracks, out of which eight concerned the central Europe region. One of these – the missing connection between Ducherow (Germany) and Świnoujście (Poland) due to a damaged lifting bridge – features also among the 48 potentially most beneficial projects identified in a more recent study by Sippel et al. (2018), commissioned by the Directorate-General for Regional and Urban Policy (DG REGIO). In total, 22

[137] A recent public consultation (April-July 2019) aimed at assessing the progress in the shift towards alternative clean fuels, multimodality of transport and digitalisation. https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-4706847_en
[138] For an interactive map see: http://www.missing-rail-links.eu/ and Cramer (2015) for the project list.

most beneficial projects for cross-border rail connections concern central Europe, out of which two non-operational and six operational rail links show a high need for improvement of passenger services (Table 2).

A central finding of Sippel et al. (2018) is that the gap in the passenger train network does often not arise from deficiencies in infrastructure, but in missing or inadequate passenger services. Some cross-border services were not attractive enough for commercial operators without financial support, some were not attractive to passengers due to the lack of services (e.g. forcing passengers to change trains resulting from limited interoperability of vehicles). Transnational activities in central Europe could put a special focus on the service provision or improvement at these identified bottlenecks, which are not addressed by TEN-T financing.

Table 2: Eight potentially most beneficial projects in central Europe with high need for improvement of cross-border passenger services

	Regional connection	Type	Importance: border region	Importance: countries	TEN-T network
Non-operational	Ducherow [DE] – Świnoujście [PL]	Entirely missing	High	Medium	
	Oberwart [AT] – Szombathely [HU]	Entirely missing	Medium	Low	
Operational	Guben [DE] – Czerwieńsk [PL] – Zielona Góra [PL]	Freight only	Medium	Low	
	Wałbrzych [PL] – Meziměstí [CZ]	Freight only	Medium	Low	
	Klagenfurt [AT] – Bleiburg [AT] – Maribor [SI]	not fully exploited	Medium	Low	
	Muszyna [PL] – Plaveč [SK]	Freight only	Medium	Low	Compre-hensive
	Deutschkreutz [AT] – Sopron [HU]	not fully exploited	High	Medium	Compre-hensive
	Rosenbach bei Villach [AT] – Jesenice [SI]	not fully exploited	High	Medium	Compre-hensive

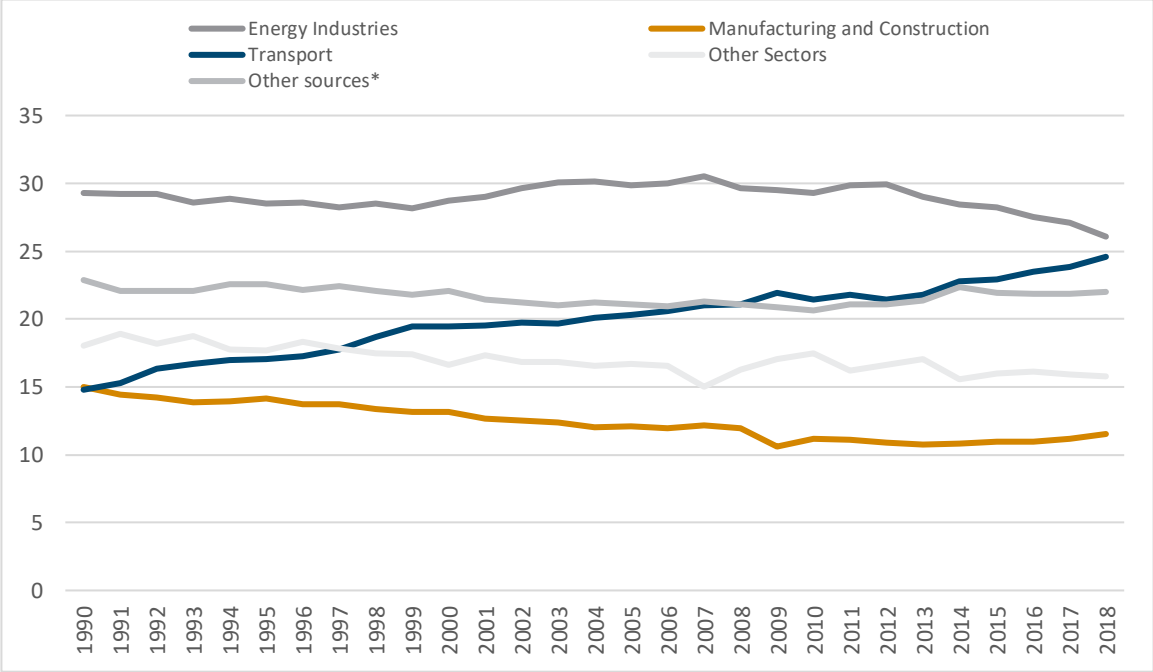
Source: Sippel et al. (2018)

Sustainable and climate resilient mobility

The European Commission's Directorate-General for Mobility and Transport (DG MOVE) makes unmistakably clear that the transport sector is increasingly contributing to the EU's total emissions, potentially soon overtaking the energy sector[139], with the share of greenhouse gases (GHG) attributable to the transport sector having climbed from around 15% in 1990 to more than 25% in 2018 (Figure 49).

[139] European Commission (DG MOVE), 2019.

Figure 49: Greenhouse gas emissions by sector for the EU-28 - Shares based on million tonnes CO2 equivalents



Note: * Other sources include: industrial processes, agriculture and waste
Source: Statistical Pocketbook of the European Commission, DG MOVE (2018) based on information provided by the European Environment Agency (EEA) in June 2019; Diagram: wiiw.

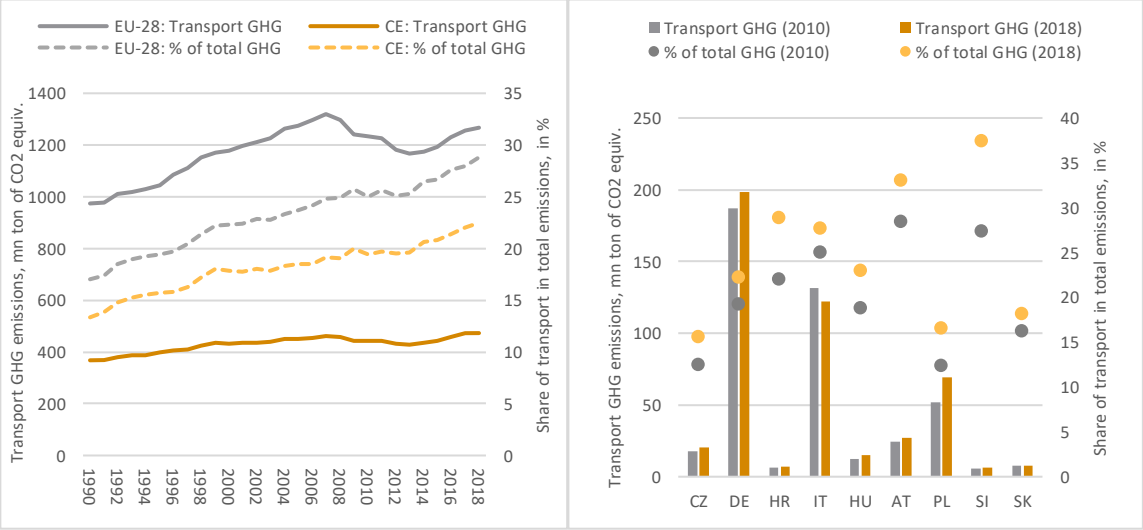
The European Environment Agency provides data on GHG emissions for the transport sector on the national level. GHG emissions peaked in 2007, went down in the course of the economic crisis and started to rapidly increase again in 2014. (Figure 50 left panel).

In absolute terms, GHG emissions in 2018 were above 2010 levels for all central Europe economies except Italy. For all central Europe countries, the share of the transport sector in total GHG emissions has increased during the same time, most significantly in Slovenia (+10pp), Croatia (+6pp) and Poland (+4pp). As of 2017, it was highest in Slovenia (35%), Austria (31%), Croatia (28%) and Italy (27%) (Figure 50 right panel).

Differences in the contribution of the transport sector arise from countries' geographical position at EU transit routes, the importance of the manufacturing industry, which in some countries (such as Poland) contributes significantly more to overall emissions[140] and the use of different modes of transport.

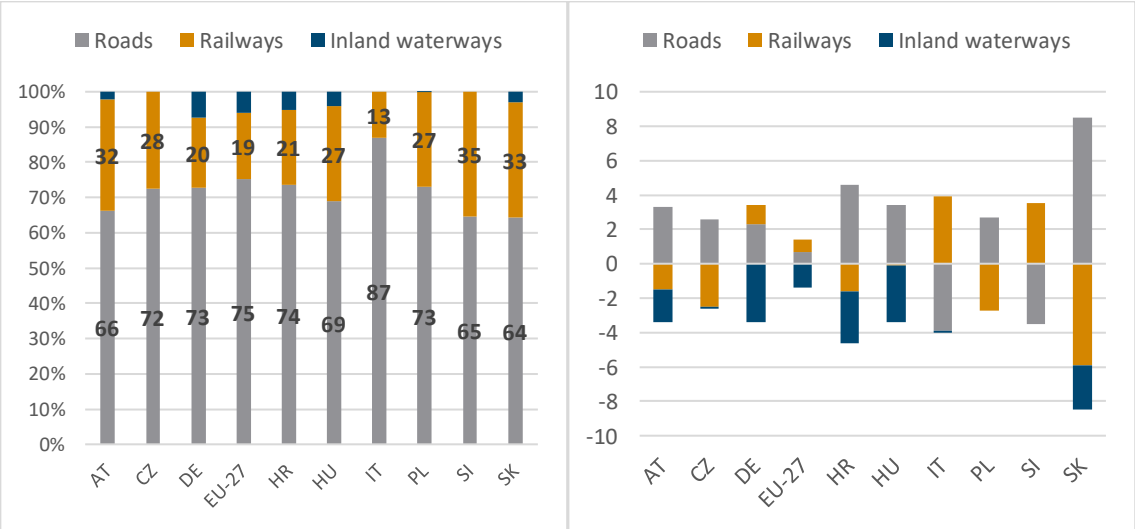
[140] See e.g. Römisch et al. (2018)

Figure 50: Greenhouse gas emissions attributable to the transport sector (million ton of CO2 equivalent) and its share in total emissions (in %)



Note: Data in these charts refer to the whole territories of DE and IT. Source: Statistical Pocketbook of the European Commission, DG MOVE (2018) based on information provided by the European Environment Agency (EEA) in June 2019; Diagrams: wiiw.

Figure 51: Modal split of freight transport in 2018 and change since 2010 by country



Notes: Percentage of each inland mode in total freight transport performance measured in tonne-kilometres.
Source: Eurostat; Diagrams: wiiw.

Making transport more sustainable requires a shift from – predominantly still fossil fuel based – road transport to more sustainable modes. As of 2018, throughout the central Europe region, more than 65% of freight is

transported via roads. Yet, with the exception of Italy, the use of railways for freight transport is above EU average for all central Europe economies (Figure 51, left panel).

The trend is, however, not comforting: Between 2010 and 2017, the share of road transport has been increasing in the EU and in central Europe particularly. This short-term development is similar to the longer-term trend since 2000, described in Römisch et al. (2018) and komobile (2013)[141]. Modal shifts towards railways have only been observed for Germany, Hungary, Italy and Slovenia. Even the small contribution of inland waterways is decreasing (Figure 51, right panel).

An Interreg CENTRAL EUROPE project addressing the decreasing shares of rail freight transport in central Europe is REIF[142]. Key tasks are to improve the coordination among freight transport stakeholders and strengthen the capacities in multimodal logistics management to make rail freight solutions more attractive.

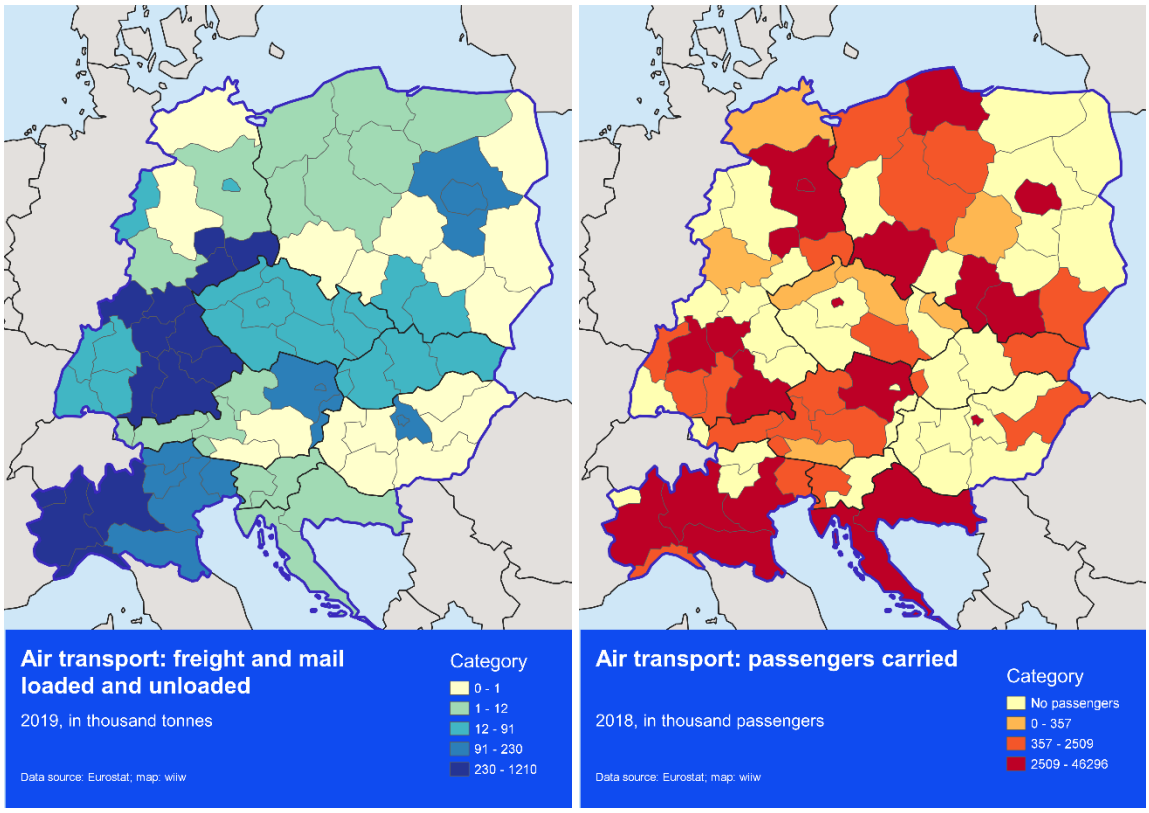
What is not considered by the statistics on the modal split of freight transport is air traffic. In 2017, 71.7% of the transport sector's GHG were attributable to road transportation, 13.4% to maritime transport, 13.9% to aviation and 0.5% to railways[143]. Between 2010 and 2017, GHG measured in million tonnes of CO_2 equivalents decreased by 10% and 12% for maritime and railway transport, respectively, while it increased by 1.7% for road transport and 16.5% for civil aviation.

The current state of air transport of freight and passengers in central Europe[144] is shown in Figure 52: In comparison to other modes of transport, the main advantage arising from air transport is time saving. Yet, often air transport is even cheaper than other modes. Recently, a European citizens' initiative has been launched, asking for a European kerosene tax and the introduction of VAT, which currently does not apply for international plane tickets[145]. Certainly, (competition-distorting) tax exemptions for the aviation sector need to be discussed and their impact evaluated.

As of today, air transport is still marginalised by other modes of transport, predominantly by road traffic. Given price-distortive measures, the strong increase in air transport of freight and particularly passengers and its negative externalities on the environment, transnational cooperation could be a means to assessing the relevance of air traffic for sustainable transport in central Europe.

[141] komobile (2013): "EU-12 member states [within central Europe] are facing a tremendous increase of passenger transport by car on the cost of more sustainable modes as rail transport, which has significantly dropped in the last two decades. Freight transport demonstrates a similar trend. While sustainable modes lost market shares (especially rail), road transport tripled within 15 years."
[142] Duration: April 2019 to March 2022; with a budget of EUR 2.2 million and 10 partners in six CE countries.
See: https://www.interreg-central.eu/Content.Node/REIF.html
[143] European Commission, DG MOVE (2018): Statistical Pocketbook
[144] Unfortunately, data is incomplete and provided for different regional levels across countries and indicators.
[145] See https://ec.europa.eu/citizens-initiative/public/initiatives/ongoing/details/2019/000009 or https://www.endingaviationfueltaxexemption.eu/ for the European citizens' initiative registered in May 2019.

Figure 52: Air transport of goods and passengers



Source: Source: Eurostat [tran_r_avgo_nm, updated 4 July 2019 for goods transport and tran_r_avpa_nm, updated 5 June 2019 for passengers].

Air pollution, road congestion, accidents and traffic-related noise are of increasing concern in cities throughout the EU. Two out of ten goals in the Commission's White Paper of 2011 were explicitly referring to urban areas: (1) 'halve the use of conventionally fuelled vehicles in urban areas by 2030, phase them out by 2050, and (2) achieve CO2-free city logistics in major urban centres by 2030.

Safe mobility

In 2017, no person lost her life in air transport over EU-28 territory, 15 passengers were killed in accidents involving railways, while a total of 25,256 road fatalities were recorded. Though still high, the number of road fatalities has reduced continuously from 77,337 fatalities in 1990, to 57,082 lives lost in 2000, and 31,506 deaths in 2010. Putting the number of road fatalities in relation to countries' size, Croatia and Poland stand out with more than 75 killed persons per million inhabitants in 2017. More than 184 fatalities per million cars were recorded for Croatia and Hungary in the same year. For most of the central Europe region, these measures are above the EU average (Table 3).

Table 3: Road fatalities in central Europe in 2017

	Total	Reduction during 2010-2016	Per million inhabitants	Per million cars	Pedestrians
AT	414	25.0%	47.1	85.2	17.6%
CZ	577	28.1%	54.5	106.4	22.4%
DE	3,180	12.8%	38.5	68.9	15.4%
HR	331	22.3%	80.1	210.2	16.9%
HU	625	15.5%	63.9	184.2	27.2%
IT	3,378	17.9%	55.8	88.4	17.8%
PL	2,831	27.6%	74.5	128.2	30.8%
SI	104	24.6%	50.3	93.9	9.6%
SK	276	25.6%	50.7	127.0	29.0%
EU-28	25,256	19.8%	49.3	96.5	21.2%

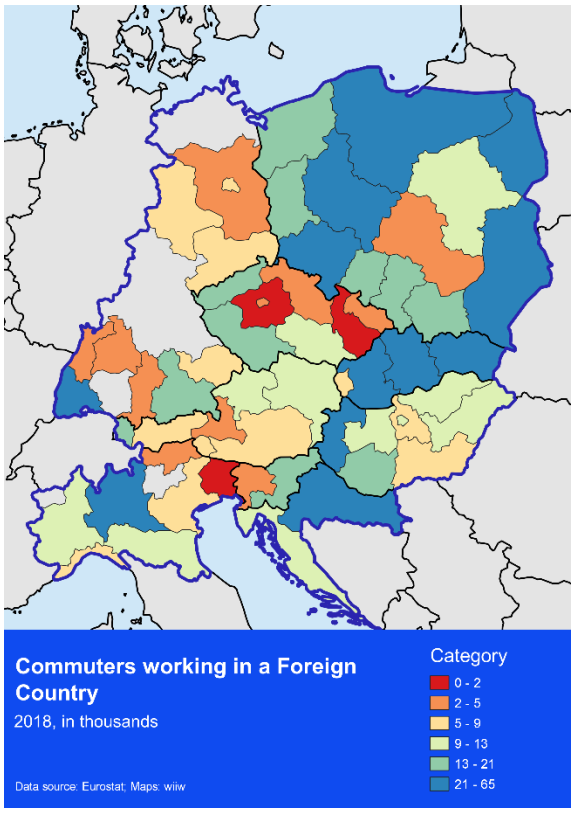
Note: Cyclists are counted as drivers. Source: Statistical Pocketbook of the European Commission, DG MOVE (2018) based on the CARE database.

A modal shift in the transport sector therefore is desirable from an environmental as well as from a safety point of view. Some regions in central Europe show a particularly high number of commuters, not only within their respective region or country, but even across countries (Figure 53). Part of the Interreg project SubNodes[146] is the testing of approaches for passenger mobility in and between medium-sized cities suitable to be developed to intermodal secondary hubs. It includes initiatives to raise awareness among commuters for improved rail links, introducing job-tickets, offering bike services on trains or introducing intermodal displays.

Striking is also the fact that 29%-30% of all victims in Slovakia and Poland as well as 27% of those in Hungary were pedestrians. Figures would probably be even more alarming if cyclists were not counted as drivers. From a sustainability as well as from a safety point of view, a higher priority should be given to the improvement of infrastructure for pedestrians and cyclists. In this field, not only the exchange of best practices among central Europe economies but with pioneers within the EU – i.e. the Nordic countries – should be considered.

[146] Duration: September 2017 to August 2020; with a budget of EUR 1.85 million and 9 partners in six CE countries. See: https://www.interreg-central.eu/Content.Node/subnodes.html

Figure 53: Commuters to foreign countries



Source: Eurostat [Commuters: lfst_r_lfe2ecomm, updated 21 Sept. 2019]; Maps: wiiw

Intermodal and intelligent mobility and freight transport

Expectations regarding the development of the rail-road combined transport market within Europe are positive among important market players, who forecast a transport volume growth of more than 5% p.a. for 2019 and 2020 (BSL, 2019). Among the central Europe economies national policies towards the promotion of combined transport vary greatly. Transnational cooperation might be fruitful in evaluating different schemes in place and fostering exchange of experience.

Intermodal and intelligent transport is not only be concerned with resource-efficient combinations of road and rail transport, but also covers the Motorways of the Sea and inland waterways. Yet, the lack of disaggregated data on infrastructure, passenger and goods transport limits options for empirical analysis.

Nevertheless, because of technological advances intelligent transport is a hot topic in the European transport discussion. Intelligent transport systems, like traffic management systems can reduce traffic congestion, while modern technologies freight management and logistics support co-modality by improving infrastructure, traffic and fleet management and facilitating a better tracking and tracing of goods across the transport networks. Besides making personal and freight transport more efficient and less time consuming, such technological changes also contribute to making transport ecologically more sustainable. Additionally, if used in vehicles intelligent transport systems (e.g. driver support systems) will make transport safer, reducing the social costs of transport.

To make full use of intelligent and intermodal transport systems European cooperation is key, as the utility of such systems increases the more countries introduce them in a harmonised way, e.g. in the case of intelligent cross-border travel information and traffic management services. Quite naturally therefore, there is room and need for transnational cooperation to introduce these systems and make them work efficiently in all of central Europe.

Table 4: National funding programmes for combined transport

Funding programmes by types	AT	CZ	DE	HR	HU	IT	PL	SI	SK
Operational (funding per km)	■			■		■			
Operational (Process)	■		■						
Operational (Technology)	■	■	■						
Infrastructure (Rail track)	■		■				■		
Infrastructure (Terminal)	■	■	■						
Intermodal wagons	■						■		
Intermodal loading units	■	■	■				■		
Research	■	■							
Rolling highway (RoLa/transport of road trucks by rail)	■					■			
Fiscal support (e.g. tax exemptions, reduced charges)	■			■					

Source: BSL (2019) based on feedback by national authorities and BSL market research. No feedback received by Hungary. No funding according to the feedback by Slovakia and Slovenia.

4.4.2. Policy needs and potentials

Based on above analysis the following policy needs are identified:

- Central Europe needs to improve its (cross-border) connections and links to the TEN-T network
- Transport needs to shift to environmentally more sustainable modes, e.g. by introducing more efficient road transport systems (e.g. electric cars and public transport) and/or shifts to more environmentally friendly transport modes.
- Road traffics safety needs to be improved
- Intelligent and intermodal transport systems need to be supported, in order to shift to a more efficient, environmentally friendly and safer way of transport goods and passengers.

For all these needs there is a potential for transnational cooperation to contribute with its policy toolkit. Potential areas include:

- Central Europe connectivity
    - removing existing bottlenecks within and across countries, through thoroughly planning and thereby assisting the construction of missing transport links and the provision of respective (cross-border) transport services;
    - integrating of various transport modes (road, rail, water, air) while ensuring interoperability and the increase of transport infrastructure capacities where necessary

- Sustainable and climate resilient mobility
    - promoting of an efficient and sustainable use of the existing transport infrastructure
    - promoting a shift to the least polluting and most energy efficient modes of transport
    - maintaining or improving the quality of infrastructure in terms of safety but also climate and disaster resilience
    - making use of technological innovations to improve safety and ecological sustainability.
- Safe mobility
    - conducting risk mapping and safety rating, i.e. proactive assessments to assess the safety quality of the road network
    - supporting the introduction of intelligent transport systems for vehicles
    - changing the mind-sets of drivers to more responsible use of roads
    - taking into account mobility needs and challenges for disabled and elderly people.
- Intermodal and intelligent mobility and freight transport
    - establishing traffic management systems to provide early warnings for incidents and emergencies, and to implement response strategies for a safe and efficient use of the transport network.
    - providing multimodal traveller information systems
    - supporting co-modality of freight transport with infrastructure and traffic and fleet managements systems
    - integrating long-distance freight transport with last-mile distribution

Looking at the current Interreg CENTRAL EUROPE Programme shows that the transport related projects make more or less full use of the tool kit available for transnational cooperation, which includes pilot actions, the development of tools, capacity building, the exchange of knowledge and expertise, awareness campaigns as well as the development of strategies and policies. Additionally, the distribution of Interreg CENTRAL EUROPE projects across transport related challenges indicates that the programme can handle existing or also new challenges very well within its framework. Consequently, one policy recommendation is to continue with the work that is already being done and potentially adjust it slightly to topics that have not been covered so far.

Nevertheless, it is recommended that ways are developed to either upscale the projects' results or roll them out to a larger audience, to multiply their effects, increase the efficiency of funding and foster the programme's ability to support territorial cohesion. Upscaling or roll-out activities could be developed in connection with the Interreg Specific Objective "A better cooperation governance" that might provide the adequate framework for this (see the analysis of the Interreg Specific Objective below).

To illustrate, the Interreg CENTRAL EUROPE Programme's potential to effectively deal with the specific objective regarding connecting regional and local mobility, here is a short summary of related projects.

The TRANS-BORDERS project supports cross-border passenger transport between Germany, Poland and the Czech Republic as well as between the border regions of Austria and Slovenia. The CONNECT2CE project improves cross-border rail services and works on integrated ticketing and tariff schemes as well as the harmonisation of multimodal timetables. The project REIF addresses lacking connectivity at regional level via developing and applying tools to analyse regional potentials for rail freight transport. RUMOBIL supports transnational cooperation between public authorities enabling them to respond to pressures on regional public transport systems caused by demographic change in peripheral areas. SHAREPLACE improves the

connectivity of local, regional and mobility systems via ICT systems, while the SMACKER project promotes demand-responsive public transport and mobility services that connect local and regional systems to main corridors and transport nodes. Finally, YOUMOBIL enhances the passenger transport system for young people living in rural areas and improving their access to the European and national transport networks.

5. A MORE SOCIAL EUROPE (PO4)

5.1. INTRODUCTION

A well-functioning society provides equal opportunities to all society members and promotes social inclusion of all societal groups. Reducing poverty and material deprivation are cornerstones of combating social exclusion. In many cases, unemployment, poverty and material deprivation go hand-in-hand that trigger a vicious circle and reduce individuals' opportunities to take part in society[147]. This often corresponds also to a limited access to public services, most importantly, services of general economic interest (e.g. hearth care services). Being excluded from economic, social, and civic life increases the risk of individuals' perception of lagging behind, which can fuel social tensions within societies[148].

Moreover, the rapid transformation of the labour market due to globalisation and the cross-country division of labour has increased the demand for work flexibility and has decreased job stability[149]. This not only introduced new requirements for training and skills but additionally amplifies social risks. In turn, this pushed further individuals' anxieties about disruptions and insecurity[150] and eventually also affected the trust in national and supranational political institutions[151].

Previous studies have already pointed out that social and labour market related challenges are not only of concern for the entire European Union, but are also substantial challenges for the central Europe region in particular[152]. In 2016, the European Commission published the EU Regional Social Progress Index (EU-SPI) which summarizes the social progress that has been achieved in EU regions[153]. As indicated in Figure 54, some central Europe regions perform quite well with respect to social progress. However, it is also visible that central Europe regions, most notably in the North-East and South, reveal some room for improvements.

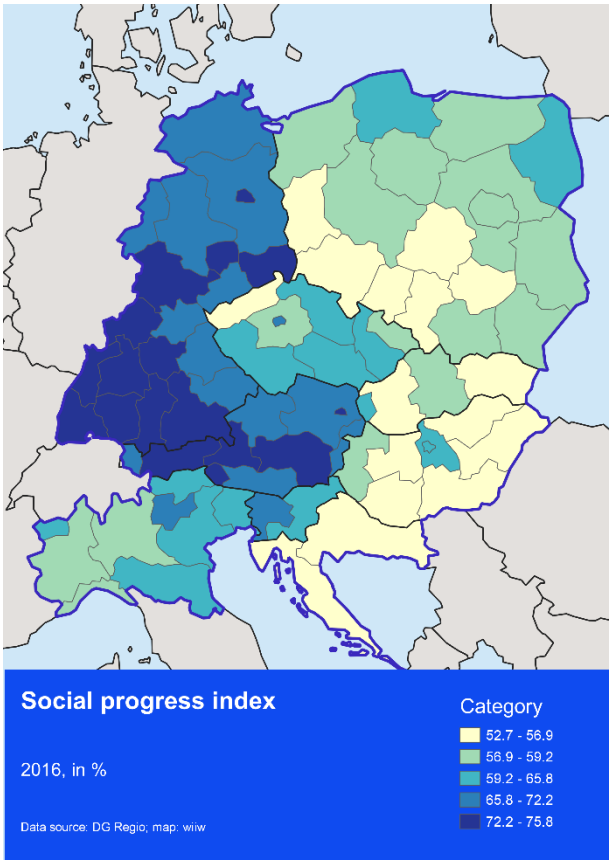
Fighting poverty and social exclusion has a long tradition on the European Union's policy agenda and is an important element in current EU strategies and programmes. In the Europe 2020 Strategy, the European Commission defined reducing poverty and social exclusion as one of their major challenges. Up to 2020 the number of people in poverty or at risk of poverty and social exclusion should be reduced by at least 20 million. Social inclusion is also a key objective in the New EU Strategic Agenda 2019-2024[154]. The EU Youth Strategy aims to support and encourage young citizen to participate in society.

The Youth Guarantee further exclusively supports young people who are not in education, employment or training in deprived EU regions. More recently, the EU has started putting the social dimension even more at the centre stage by defining the European Pillar of Social Rights. This framework specifies 20 principles structured in three categories: equal opportunities and access to the labour market; fair working conditions; and social protection and inclusion. The Pillar constitutes a guideline for development of new initiatives in the area of social policy. As concerns the central Europe region, regions in Austria, Germany, the Czech Republic,

[147] DG Regio, 2011.
[148] OECD, 2017.
[149] ÖIR and PAN IGiPZ, 2012.
[150] European Commission, 2017.
[151] OECD, 2017.
[152] DG Regio, 2017; wiiw, 2018.
[153] Specifically, this indicator is built up of 50 sub-indicators in three categories: basic human needs, foundations of well-being and opportunities.
[154] European Council, 2019.

Hungary, Slovakia and Slovenia are also part of the Danube region. The EU Strategy for the Danube Region also defines reducing poverty and social exclusion as a priority area.

Figure 54: EU regional social progress index 2016, in %



Source: DG Regio.

The European Social Fund (ESF) plays a decisive role for funding social investments to meet EU strategies and aims. Many actions on promoting social inclusion and social protection, improving living and working conditions as well as training and skills, and fighting poverty have been undertaken under the umbrella of the ESF. Complementarily, the EU Programme for Employment and Social Innovation, as managed directly by the European Commission, also provides funding to combat long-term unemployment as well as social exclusion and promote social protection.

Further funding for social and labour market related purposes is provided by the Youth Employment Initiative (YEI), the European Globalisation Adjustment Fund (EGF), and the Fund for European Aid to the Most Deprived (FEAD). For the next EU budget 2021-2027, a new European Social Fund (ESF+) is proposed where the aforementioned existing funds and programmes are merged together to allow a more targeted and integrated support to tackle social and labour market challenges.

The list of strategies and programmes discussed above emphasises the role and importance of social and labour market challenges. In particular, the European Pillar of Social Rights constitutes a strong commitment to deal with social and labour market issues. Although the current Interreg CENTRAL EUROPE 2014-2020 Programme does not address social and labour market challenges directly, ongoing projects already deal with a (long-term) labour market integration and subsequently effective inclusion of disadvantaged individuals in central Europe regions. Transnational cooperation (TNC) has shown to be a valuable tool for discussing potential solutions and sharing best-practise knowledge across borders.

The following sections focus on the policy objective 4 'a more social Europe implementing the European Pillar of Social Rights'. Within the scope of this PO, the analysis specifically addresses the following specific objectives:

- Enhancing the effectiveness of labour markets and access to quality employment
- Improving access to inclusive and quality services in education, training and lifelong-learning
- Increasing the socioeconomic integration of marginalised, disadvantaged groups
- Ensuring equal access to health care

For each specific objective, corresponding policy needs and potentials with respect to TNC are derived and presented.

5.2. ENHANCING THE EFFETIVENESS OF LABOUR MARKETS AND ACCESS TO QUALITY EMPLOYMENT

5.2.1. The challenge

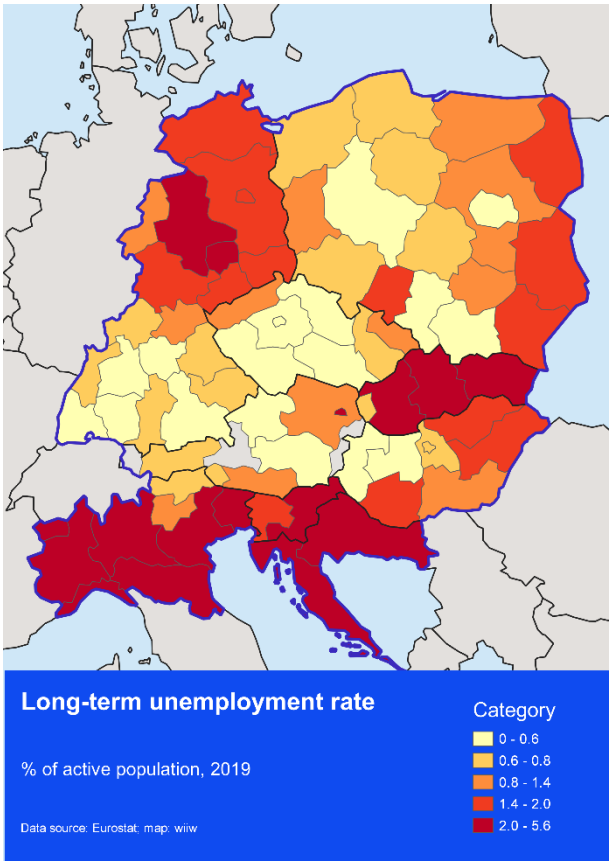
One of the main aims of EU policy is to promote employment. For instance, the Europe 2020 strategy embeds an explicit goal of increasing employment. In principle, employment is an essential prerequisite to cover individuals' needs and to participate in society. From a policy perspective, it therefore allows reducing poverty and limit social exclusion.

In particular, long-term unemployment amplifies the risk of longer unemployment spells and even inactivity; which subsequently increases the risk of poverty and social exclusion. Even though long-term unemployment rates went down in all EU countries in 2017, rates still vary markedly across countries[155].

Figure 55 illustrates the long-term unemployment rates in 2019 across central Europe regions. It is defined as being unemployed for a period longer than 12 months. As it is visible, most of the regions show low levels of long-term unemployment rates below two percentage points. However, long-term unemployment is still a serious problem in some central Europe regions, most notably, less prosperous regions. Interestingly, regions with high rates are spatially clustered, which clearly indicates how local labour markets are connected across regions within countries. The most striking contrast is visible in Germany, where a clear labour market divide between former Western and Eastern German regions emerges. Further clusters can be found in the Polish region Wschodni, in Slovakia, in Croatia and in the Northwest of Italy. Accordingly, there is a strong need to improve the effectiveness of the labour market in particular at a local scale.

[155] European Commission, 2018.

Figure 55: Long-term unemployment rate 2019, in % of active population



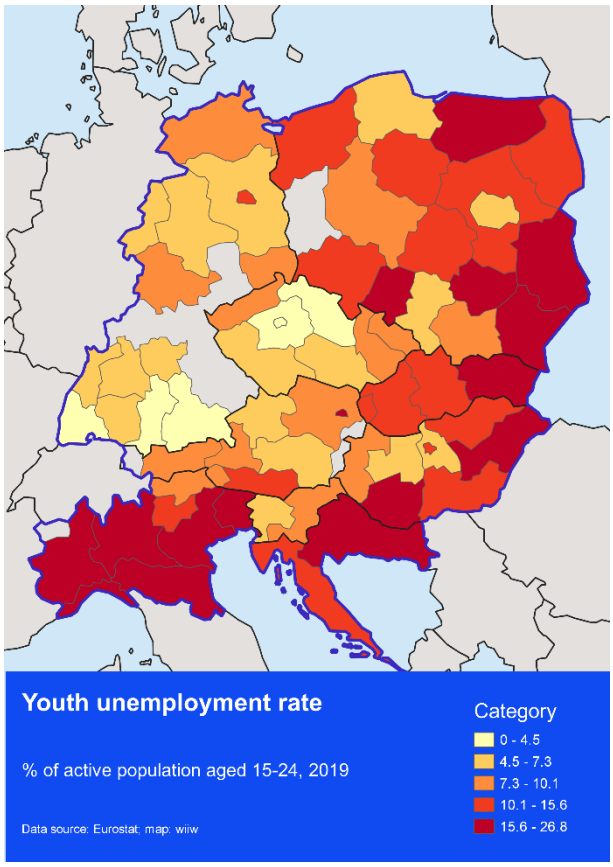
Source: Eurostat.
Notes: DE25, DE26 – 2017.

Young individuals are one of the most important engines for future economic development in the EU. In particular, unemployed young individuals are vulnerable to poverty and social exclusion[156] and are at risk of wasting their creative and skill potentials. This is why the EU prioritises promoting employment among the youth. The Youth Employment Initiative promotes the implementation of the so-called Youth Guarantee which constitutes a commitment by all Member States to ensure the employment and education of all young people under the age of 25[157]. Youth unemployment has started to decline at EU-level after 2013 and broke through the pre-crisis level of 15% in 2018.

Nevertheless, Figure 56 makes it clear that youth unemployment is still a key challenge in most central Europe countries. Overall, the central Europe regions are characterised by a heterogeneous pattern of unemployment rates among the youth, ranging from around four up to almost 27%. Labour markets show again to be locally connected, as it was already observed above. Importantly, the pattern of the youth unemployment coincides to a large extent with that of long-term unemployment. Not surprisingly, labour market related challenges are highly interrelated. In turn, this emphasises even more the need to foster the functioning of local labour markets in these regions.

[156] Eurostat, 2018.
[157] http://ec.europa.eu/social/main.jsp?catId=1079

Figure 56: Youth unemployment rate 2019, in % of active population aged 15-24

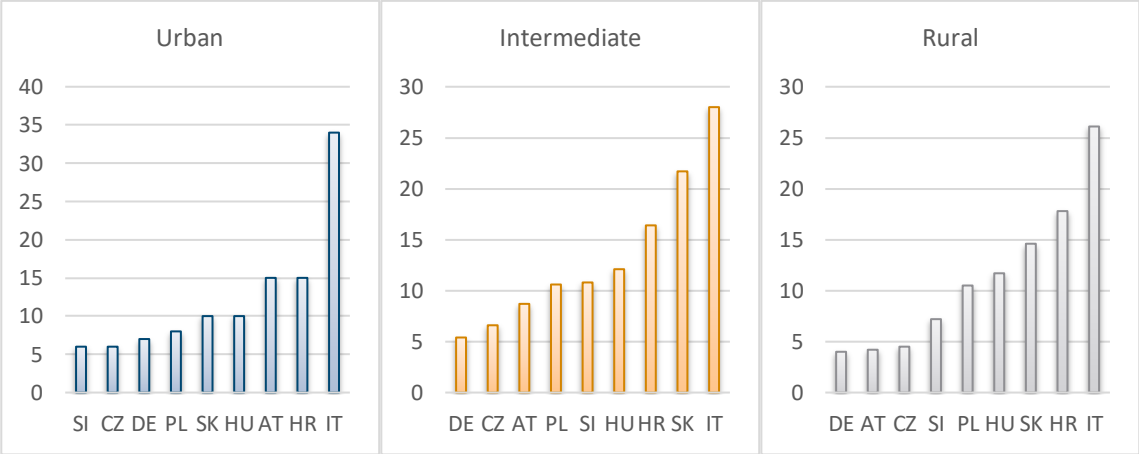


Source: Eurostat.
Notes: DE25, DED2, PL52, HU12 – 2015; AT21, AT32, AT33, DE14 – 2017; HU22, PL84, SK01 – 2018.

A rural-urban comparison provides further important insights into the pattern of youth unemployment (see Figure 57). Italy[158] shows a high youth unemployment rate across all types of urbanisation. Interestingly, in most central Europe countries there are hardly differences between rural and urban regions. Only Austria and Slovenia show a clearer rural-urban pattern: youth unemployment tends to be concentrated in urban regions.

[158] In Italy, however, the rates are much affected by the relatively high youth unemployment rates in the Southern regions which are not part of the CE programme area. Although Italy experiences an overall high unemployment rate among young individuals, this issue is particularly pronounced in South Italy.

Figure 57: Youth unemployment rates 2019, in % of active population aged 15-24 by urbanisation degrees



Source: Eurostat.

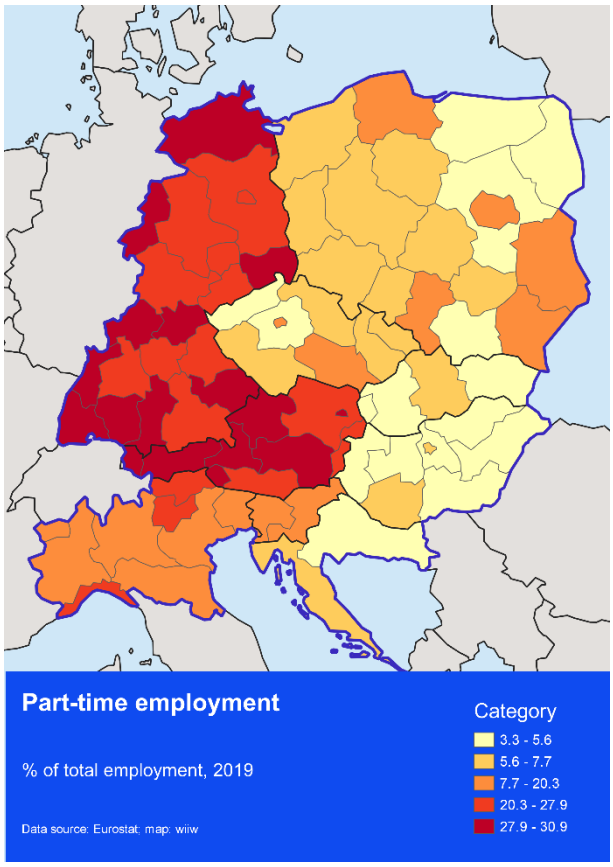
Having a job is essential for preventing poverty and allowing social inclusion. However, labour markets do not always provide quality jobs.[159] The labour market transformation, as triggered by globalisation, has brought with it trends of increasing flexibility and destabilisation of employment paths.[160] Moreover, the global financial and economic crisis has also put pressure on labour markets which additionally pushed the flexibilisation of employment conditions[161]. As a consequence, the number of non-standard, atypical jobs has increased in European countries. These jobs tend to be associated with lower job quality covering lower earnings, higher job insecurity and higher job strain[162], which can have substantial repercussions on individuals' well-being[163].

The EU Commission stresses the role of fair working conditions in the European Pillar of Social Rights. For instance, according to the Pillar workers have the right to fair and equal working conditions and to fair wages that provide a decent standard of living. In addition, the Youth Employment Initiative (YEI) aims at supporting disadvantaged young individuals to find quality employment.

Figure 58 depicts the share of part-time employment in central Europe regions in 2019. It shows a clear spatial pattern: part-time employment is particularly high in Germany, Austria and Italy. In all other central Europe countries, regions reveal part-time employment shares below 20% and, in most cases, even below 8%. Importantly, within central Europe countries there is hardly variation across regions. That is not that surprising, as the employment structure within countries depends crucially on national institutions.

[159] OECD, 2017.
[160] ÖIR and PAN IGiPZ, 2012; DG Regio, 2011.
[161] Eurofond, 2014.
[162] OECD, 2017.
[163] Eurofond, 2014.

Figure 58: Part-time employment 2019, in % of total employment

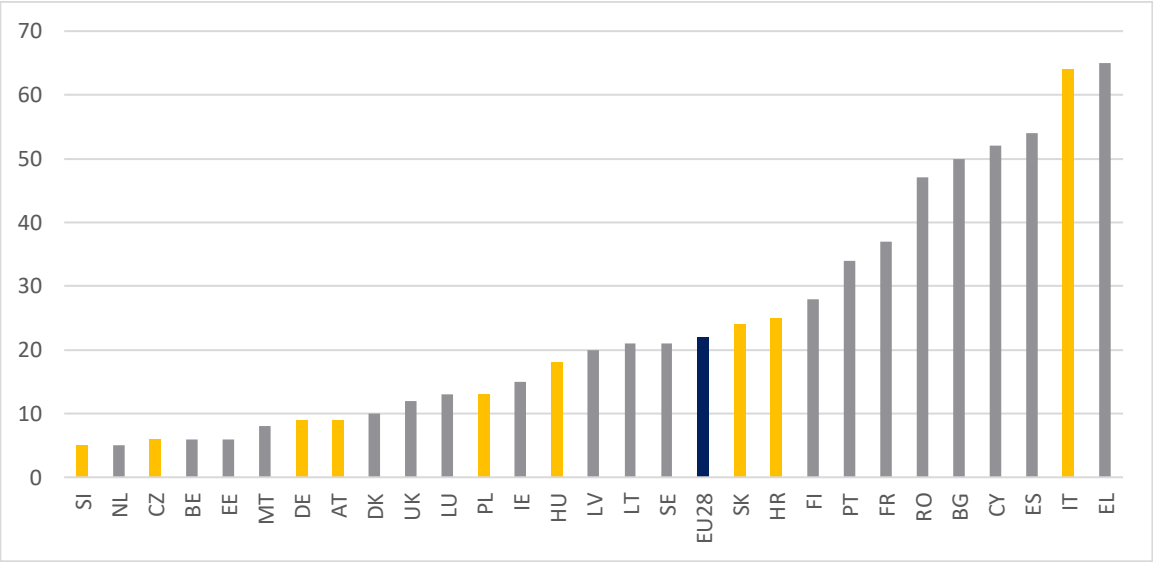


Source: Eurostat.

In general, a high part-time share is not problematic per se: individuals may choose a part-time job voluntarily to have more spare-time. However, individuals also hold part-time jobs involuntarily, as they would choose to have a full-time job when such a job is available. Figure 59 presents the share of involuntary part-time employment in % of total number of part-time employment in 2019. Central Europe countries show a heterogeneous pattern, where the share of involuntary part-time workers among total part-time workers ranges from approximately five percent in Slovenia to around 64% in Italy. Croatia, Slovakia and Hungary reveal shares around the EU-28 average of nearly 22%. As part-time employment tends to be more pronounced among women, involuntary part-time employment is particularly an issue for women. Importantly, in Slovakia and Hungary parenthood shows also to have a substantial negative impact on female employment[164]. This points to crucial difficulties in the labour market integration of women in these regions.

[164] European Commission, 2016.

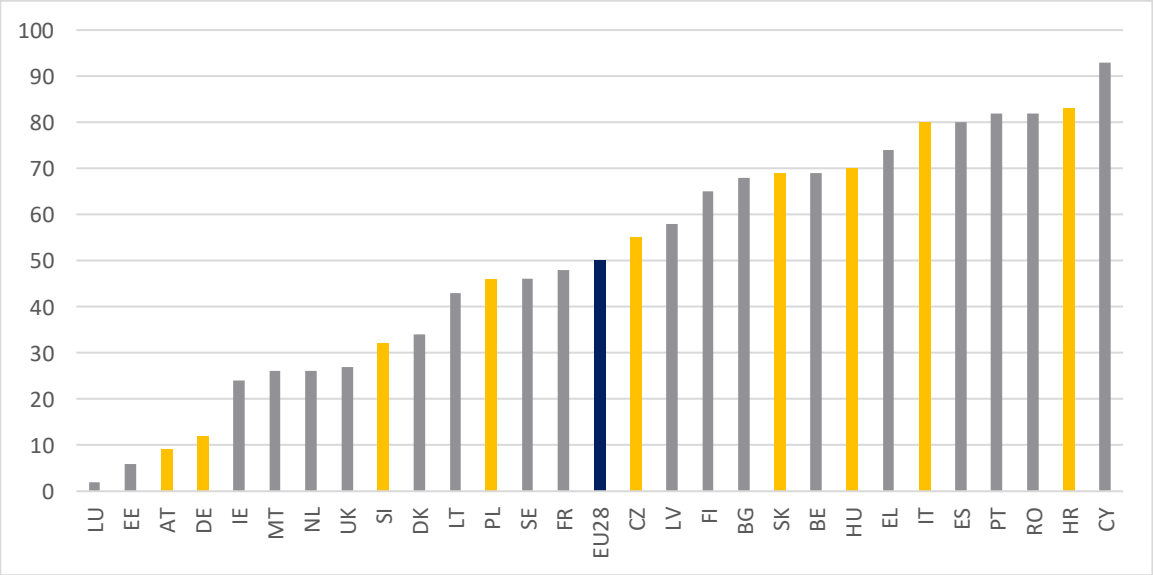
Figure 59: Involuntary part-time employment 2019, in % of total part-rime employment



Source: Eurostat.

In particular, temporary employment tends to be related to lower job quality[165]. It is therefore important to take a look at individuals who hold temporary jobs involuntarily. Figure 60 shows the share of involuntary temporary employment in % of total temporary employment in 2019. The central Europe region is again characterised by a heterogeneous pattern.

Figure 60: Involuntary temporary employment 2019, in % of total temporary employment



Source: Eurostat.

[165] Eurofond, 2014.

Germany and Austria reveal low rates of involuntary temporary employment of around 10%. Slovenia, Poland and the Czech Republic show shares around the EU-28 average of approximately 50 percentage points. Relatively high shares, also compared to other European countries, are found in Hungary, Slovakia, Italy and Croatia. It is striking, that in Italy and Croatia 80% or more of the individuals who are in temporary employment have not found a permanent job. Both countries are also those with one of the highest shares of temporary employment in % of total employment (13.4 and 16.0% in 2019, respectively) among central Europe countries. The highest share of temporary employment in % of total employment can be found in Poland with around 17%. Interestingly, the corresponding share of involuntary temporary employment, though, is comparably lower than in other central Europe countries. Nevertheless, in central Europe regions a considerable proportion of individuals who hold part-time jobs does so involuntarily. It is therefore essential to focus not merely on employment, but also consider its intensity as well as the degree of labour market integration. Quality employment therefore plays an important role when it comes to the effectiveness of local labour markets.

5.2.2. Policy needs and potentials

Since 2013 EU labour markets have been recovered markedly[166]. Long-term unemployment rates are comparably low in most central Europe regions. Nevertheless, the analysis identifies local central Europe labour markets that are still lagging behind. Long-term as well as youth unemployment are high in some central Europe regions that indicates a serious issue, as it fuels the risk of poverty and social exclusion even more in the future. By focusing on employment, policy also needs to address working conditions: in particular quality employment allows individuals to cover their needs and ensures individuals' well-being. In some central Europe countries, a significant part of individuals who hold part-time or temporary employment actually want to have a full-time or permanent job, respectively. Thus, policy has to address the access to quality employment.

Further major challenges are lying ahead. Uncertainties related to a global trade war and the withdrawal of the United Kingdom have not only affected current economic growth but also future growth prospects in EU countries[167].This in turn is likely to have negative repercussions on EU labour markets. Moreover, the digital transformation is expected to put further pressure on EU labour markets, as digitalisation and automatization have been replacing particularly medium-skilled jobs in construction and manufacturing.[168] This is of particular concern for the central Europe region, as EU manufacturing industry is highly concentrated in this region[169].

The effectiveness of EU labour markets and the access to quality employment have been already addressed in a wide range of EU programs and strategies. Many projects and investments have already been undertaken within the framework of the ESF. However, none of these is explicitly focused on TNC.

To tackle complex challenges, innovative ways for collaborations need to be undertaken[170]. The EU promotes social innovation to generate new ideas and concepts for collaborations that prioritise local interests and needs[171]. Ideally, this involves local stakeholders from both, the market and public sector, and citizens that

[166] DG Regio, 2017.
[167] OECD, 2018.
[168] European Commission, 2019.
[169] wiiw, 2018.
[170] OECD, 2011.
[171] https://ec.europa.eu/growth/industry/innovation/policy/social_en

work together to fulfil local needs and thereby exploit local knowledge[172]. Hence, social innovations provide highly relevant bottom-up solutions.

As outlined in the analysis above, some central Europe countries face similar problems when it comes to labour market performance and quality employment. Thus, partners from different countries can approach common, transnational challenges together, while partners from better-performing countries as well as regions can provide best practise solutions. By focusing on place-based solutions, strategies can be adapted optimally to local interests and needs as well as available financial resources. Moreover, the involvement of different local stakeholders makes it possible to identify and realize substantial local possibilities. For example, local strategies and concepts can be developed together with the local industry, including the promotion of local employment possibilities and the establishment of platforms, to improve the matching between employers and potentials employees. This can also include developing trainee programs. It is also worthwhile to develop such strategies and platforms focused on particular local population groups, such as women or younger individuals, to allow sufficient tailored place-based solutions. Furthermore, common communication platforms and training programs can enhance the circulation of knowledge and skills to foster the establishment of social enterprises, which play a vital role in particular for the employment of disadvantaged individuals. To promote the supply of quality employment and to increase the general awareness, an award for enterprises providing the best quality employment can be introduced.

Within the framework of the current Interreg CENTRAL EUROPE 2014-2020 Programme, projects are already under way and some have already been finished that address (long-term) unemployed and improve the access to quality employment. Most importantly, they already embed features of social innovations. The past CENTRAL EUROPE 2007-2013 WOMEN project aims at reducing the brain drain of well-educated young women from less prosperous regions. One of the key outcomes of the project has been a transnational strategy and an action plan to create attractive career opportunities providing an incentive for young women to stay in those regions. A further valuable project is the CENTRAL EUROPE 2014-2020 INNO-WISEs[173] project, which specifically promotes the supply of quality employment to disadvantaged groups via social enterprises. The project brings together partners from various fields to develop creative solutions in social enterprise sector including an electronic communications platform and training programs. This clearly indicates how TNC can contribute to tackle common labour market challenges by developing solutions tailored to local needs and interests.

5.3. IMPROVING ACCESS TO INCLUSIVE AND QUALITY SERVICES IN EDUCATION, TRAINING AND LIFELONG LEARNING

5.3.1. The challenge

Individuals' performance at the labour market is closely related to education, training and lifelong learning. Lower educated individuals are highly vulnerable to unemployment and thus poverty as well as social exclusion. They are further less likely to take part in training and life-long learning[174]. An always faster-changing and technology-driven world makes that issue even more challenging. Updating and improving skills

[172] European Commission, 2011.
[173] https://www.interreg-central.eu/Content.Node/ENTER-transfer.html
[174] DG Regio, 2017.

is an effective way to become more flexible and employable[175]. Consequently, the opportunity of upskilling and acquiring a better education needs to be available to all societal groups.

The EU approaches this issue via various programmes. In 2016, the European Commission launched A New Skills Agenda for Europe which in particular supports low-skilled and low-educated adults to acquire skills, most notably digital skills[176].

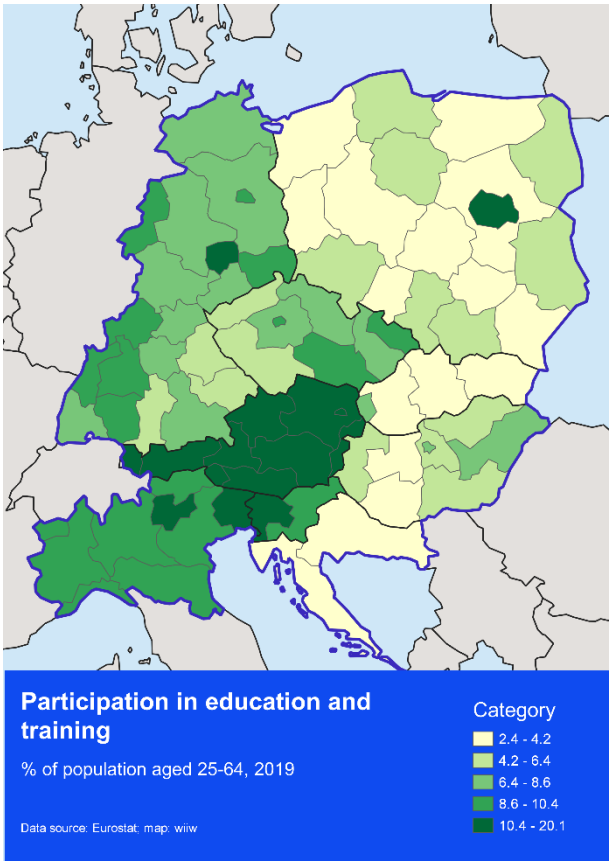
Figure 61 contrasts the participation rates in education and training in 2019 in central Europe regions. Overall, rates widely range from nearly 2 to around 20%. Regions with fairly low participation rates are located in Poland, Slovakia and Croatia. Interestingly, those regions also tend to face higher long-term and youth unemployment rates. This implies that these regions have to cope with multiple challenges.

As concerns participation rates in education and training, an urban-rural comparison provides a further interesting finding (see Figure 62). In general, participation rates are significantly higher in urban regions as compared to rural as well as intermediate regions. This is not that surprising, as education and training infrastructure are generally more pronounced in urban regions which in turn increases the availability of education and training possibilities and subsequently results in higher participation rates. Accordingly, education and training are particularly of concern in rural areas, most notably, less prosperous regions. It is widely acknowledged that early childhood education and care is fundamental for shaping individuals' learning, education and career paths[177]. The European Pillar of Social Rights advocates an affordable early childhood education and care of good quality.

Figure 63 contrasts the participation rate in early childhood education among individuals in the age between four and the starting age of compulsory education in 2018. Germany, Hungary, Austria and Italy reveal participation rates close to the EU-28 average of around 95%. All other central European countries are below this threshold. In particular, Croatia and Slovakia are lagging behind, as their participation rates only amount to around 80%. Thus, on average, approximately each fifth child[178] in those countries did not take part in early education and care.

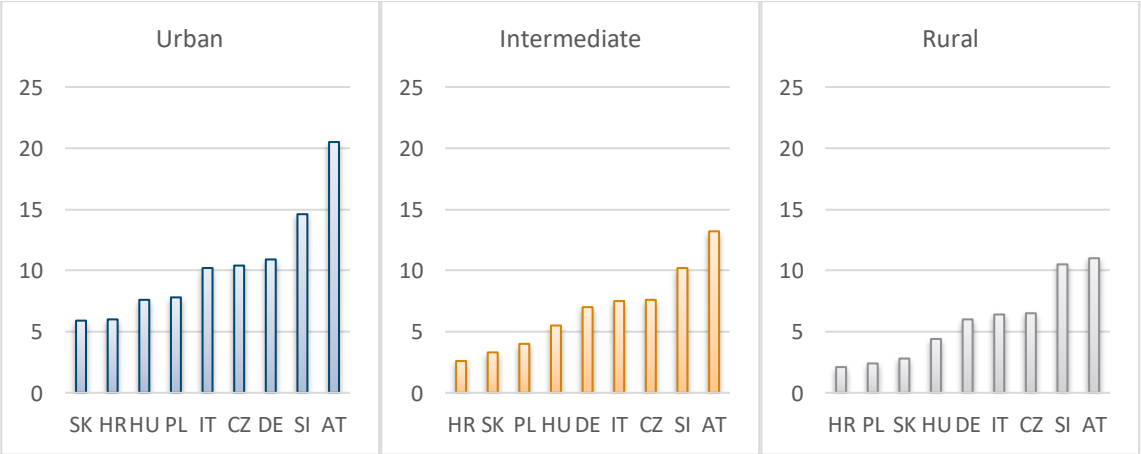
[175] European Commission, 2014.
[176] European Commission, 2016.
[177] European Commission/EACEA/Eurydice, 2019.
[178] In the age between four and the starting age of compulsory education.

Figure 61: Participation in education and training 2019, in % of population aged 25-64



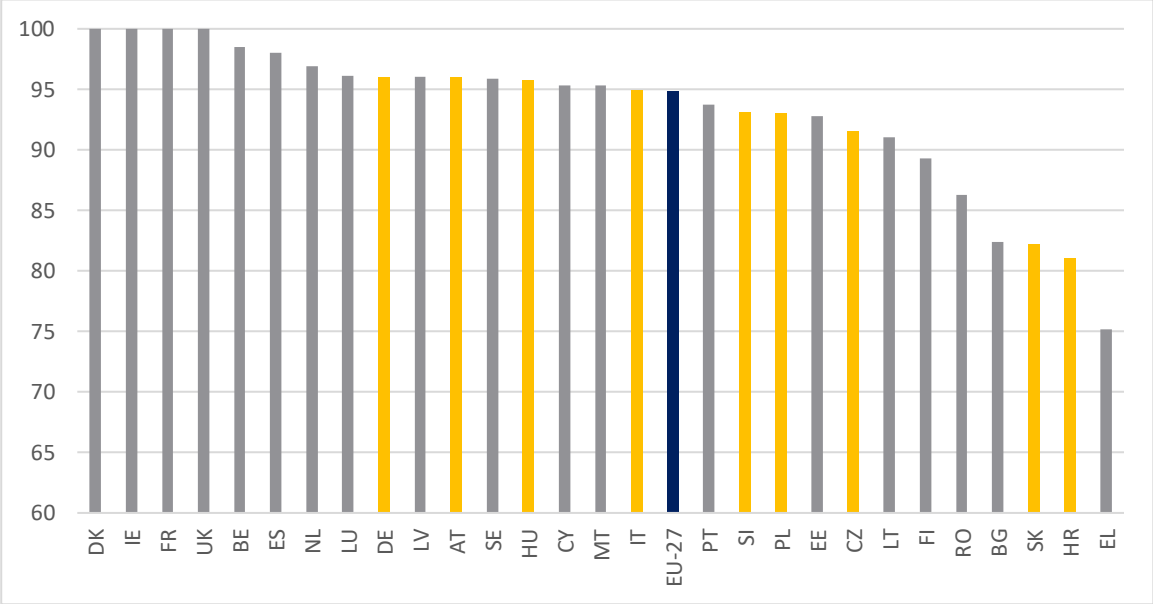
Source: Eurostat.

Figure 62: Participation rate in education and training 2019, in % of population aged 25-64 by Urbanisation Degrees



Source: Eurostat.

Figure 63: Participation in early childhood education 2018, in % of between 4-years and starting age of compulsory education



Source: Eurostat.

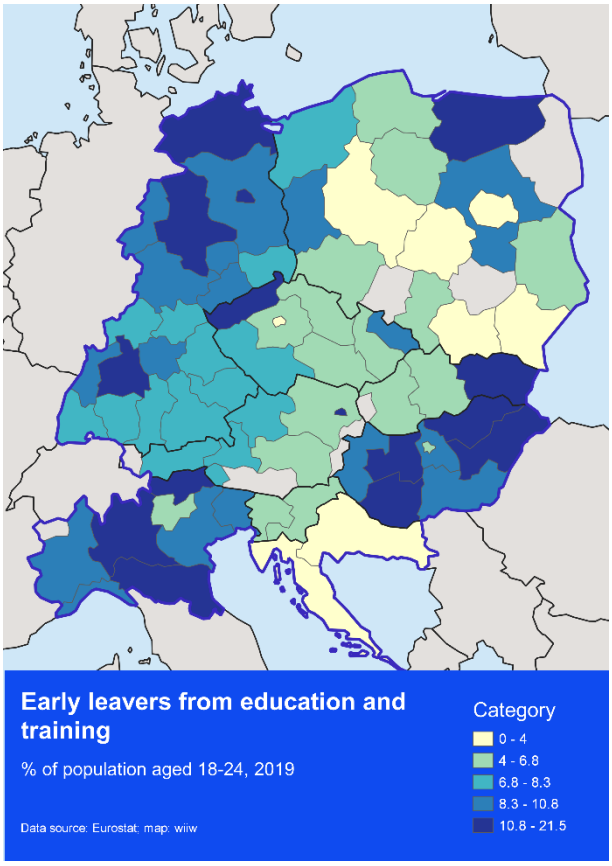
One of the most vulnerable groups to poverty and deprivation are early leavers from education and training. Being equipped only with the lowest level of schooling and with no further training, individuals are much less likely to gain ground in the labour market.[179] The European Commission defines the reduction of early school leavers among individuals aged 18-24 to 10% as one of the major targets in the Europe 2020 strategy.

The shares of individuals who have completed lower secondary education and are not involved in further training in 2019 across EU regions are illustrated in Figure 64. As it is visible, early leavers from education and training still represent a major challenge in most central Europe countries. However, this issue seems to be geographically concentrated. The pattern of early leavers is characterized by a number of hot spots: Slovakian region Východné Slovensko, North-Eastern Hungarian regions, Italian region Piemont, Czech region Severozápad and the city of Berlin.

The concentration of early leavers is also highlighted by looking at overall rural-urban differences (see Figure 65). Austria, Germany and Italy face a high proportion of early leavers in more urban regions; while Hungary and again Italy experience a high proportion in rural areas. It is therefore crucial to address local needs and interests accordingly also with respect to this challenge.

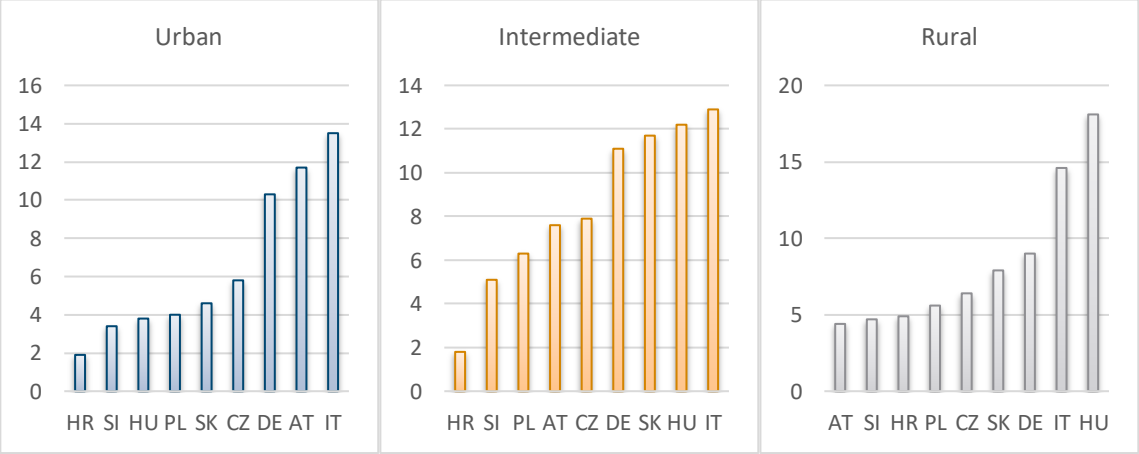
[179] DG Regio, 2017.

Figure 64: Early leavers from education and training 2019, in % of total population aged 18-24



Source: Eurostat.
Notes: DED2, PL21, PL82 – 2018.

Figure 65: Early leavers from education and training 2019, in % of population aged 18-24 by urbanisation degrees



Source: Eurostat.

5.3.2. Policy needs and potentials

Progress has been made getting individuals into education and training, even though efforts in this respect need to be intensified even more. Participation rates in education and training still show a pronounced disparity across central Europe regions. A higher level of education, training and life-long learning is required to promote the functioning of EU labour markets and to improve individuals' capability to cope with the fast-changing requirements at the labour markets. Moreover, some central Europe regions experienced a high share of early leavers from education and training. Reducing the number of drop-outs is vital to reach a higher level of education and training. This not only includes innovative ways to incentivise the participation in education, training and life-long learning activities, but also to guarantee an adequate level of infrastructure.

Training and life-long learning is becoming even more relevant in the future. Digitalisation and automatization are expected to make specific jobs redundant. This puts pressure on individuals and makes it inevitable for them to take part in training and increase their life-long learning activities.

Similar to the labour market related challenge; education, training and life-long learning have been addressed in a number of EU programs and strategies. Nevertheless, the analysis indicates high potentials for TNC, most notably, through social innovations. In particular, rural regions in central Europe countries tend to face the challenge of lower participation rates in education and training as well as higher early leavers from both, education and training. By exchanging knowledge, pooling resources and addressing local needs; TNC can be a valuable tool to promote education, training and life-long learning. For example, concepts for traineeship platforms can be developed together with local employers. In this respect, transnational platforms can even provide opportunities for cross-border traineeships and training programs. In turn, this can allow a better know-how transfer, establishing knowledge networks and intensifying cross-border business cooperation. Furthermore, communication platforms can foster the transfer of managerial know-how and skills that play a decisive role especially for young entrepreneurs. Workshops can further intensify this transfer and provide the basis for future transnational business collaborations. Public institutions, local employers and other stakeholders can work together to develop concepts for local mentorships for younger individuals supporting

them to define their future paths in education and employment. Beyond that, local public authorities and the local industry can develop strategies together to improve the possibility of learning activities for pupils. On the one hand, this can motivate pupils to take part in life-long learning activities and, on the other hand, those learning activities can be in line with local needs as well as interests. Specifically, TNC can implement pilot actions and can promote best practise solutions adaptable also for other regions.

Already in the 2007-2013 CENTRAL EUROPE Programme, projects were conducted to enhance educational and training offers. For instance, the past 2007-2013 CENTRAL EUROPE project YURA promoted educational offers, including on-the-job training strategies, for particularly younger individuals in less prosperous regions. Within this framework, concepts tailored to local needs were developed together by schools, companies and other stakeholders. Another example is the 2014-2020 CENTRAL EUROPE project ENTER-transfer[180] which seeks to find suitable solutions for national and transnational business ownership transfers. Most importantly, one major project aim is to improve the skills and competences of young entrepreneurs.

This example of projects emphasizes the potential of TNC when it comes to education, training and life-long learning. Especially cross-country collaboration between partners from less prosperous regions can deliver bottom-up solutions to accumulate human capital, boost regional competitiveness and reinforce economic cohesion within and across central Europe countries.

5.4. INCREASING THE SOCIOECONOMIC INTEGRATION OF MARGINALISED AND DISADVANTED GROUPS

5.4.1. The challenge

Social inclusion has been one of the most important challenges that the EU faces. For a society, it is indispensable to provide equal opportunities to all societal groups, most importantly, marginalised and disadvantaged groups. Just very recently, the EU underlines the importance of social inclusion by defining equal opportunities and access to the labour market as well as social protection and inclusion as main areas in the framework of the European Pillar of Social Rights. Moreover, reducing social exclusion represents a headline target of the European 2020 strategy. Further policy programmes aim to support most vulnerable and disadvantaged societal groups, for instance the Youth Guarantee promoted by The Youth Employment Initiative which supports the integration of individuals under the age of 25 years.

Social inclusion is inevitably connected with poverty and material deprivation. According to the Europe 2020 strategy, individuals are at risk of poverty or social exclusion when they are affected by one or more of the

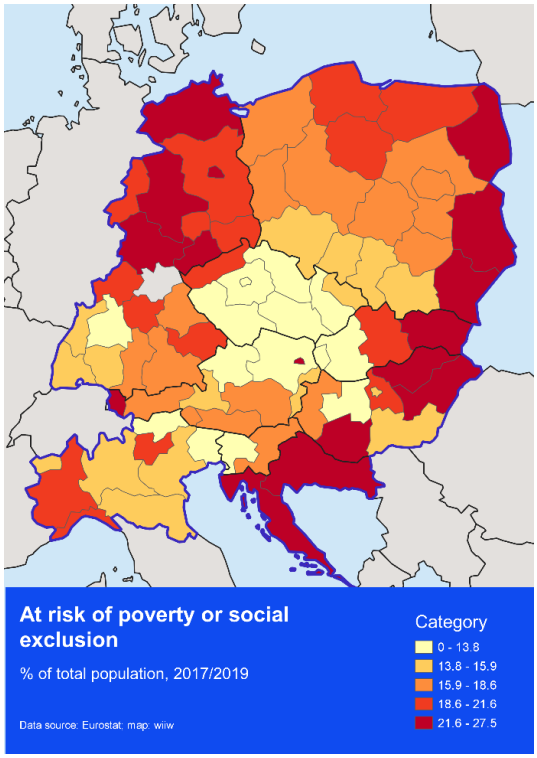
[180] https://www.interreg-central.eu/Content.Node/ENTER-transfer.html

three situations: being at risk of poverty[181], being severely materially deprived[182] or living in households with very low work intensity[183].

The risk of poverty and social exclusion is still a remarkable issue in most central Europe countries. Moreover, it is visible that the risk is highly concentrated in a few regions within countries. The Polish region Wschodni, the Slovakian region Východné Slovensko, regions in Hungary and Croatia, regions in the former Eastern German regions as well as the city of Vienna face comparably higher risk of poverty and social exclusion. Unsurprisingly, these regions also tend to show higher long-term as well as youth unemployment rates.

In addition, an overall urban-rural comparison provides further interesting insights. While the risk of poverty and social exclusion tends to be concentrated in cities in Austria and Germany, it is higher in rural areas in Croatia, Hungary, Poland and Slovakia. In Slovenia and the Czech Republic, the rates are rather balanced across urban and rural areas. In Italy the risk of poverty and social exclusion is high in all types of territories[184]. Interestingly, these two countries also reveal overall the lowest rates.

Figure 66: At risk of poverty or social exclusion 2017/2019, in % of total population

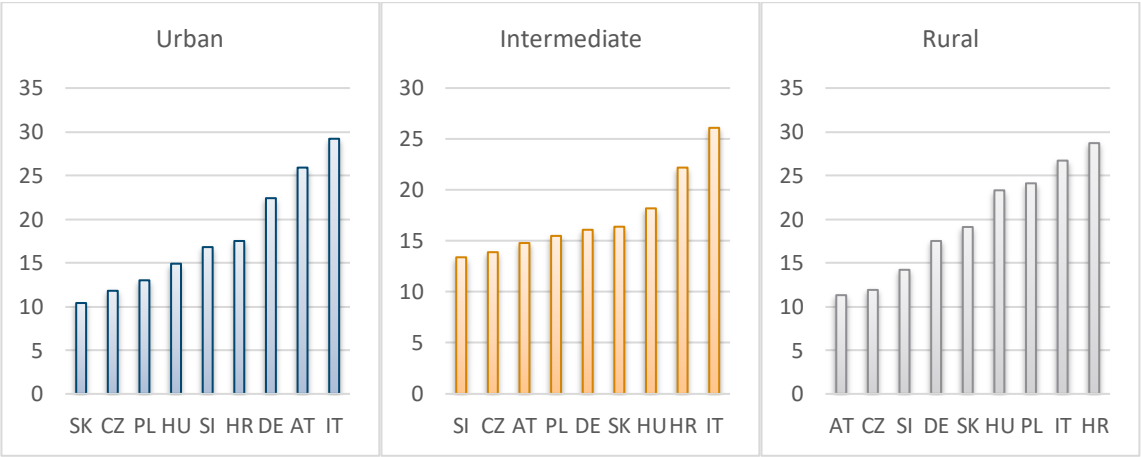


Source: Eurostat.

[181] Being at risk of poverty is measured as having an equivalised disposable income below a threshold of 60% of the country-wide median income.
[182] Individuals are severely materially deprived, when they cannot afford at least four out of nine deprivation items, they are defined as materially deprived. The nine items include: 1) to pay their rent, mortgage or utility bills; 2) to keep their home adequately warm, 3) to face unexpected expenses, 4) to eat meat or proteins regularly, 5) to go on holiday, 6) a television set, 7) a washing machine, 8) a car and 9) a telephone.
[183] Households with a very low work intensity are defined as households where adults (18-59 years old) work 20% or less of their total work potential during one year.
[184] The overall high rates in Italy are again much affected by Southern regions, as risk of poverty and social exclusion is more concentrated in the South.

Notes: AT, DE, SK – 2017.

Figure 67: At risk of poverty or social exclusion 2018/2019, in % of total population by urbanisation degrees



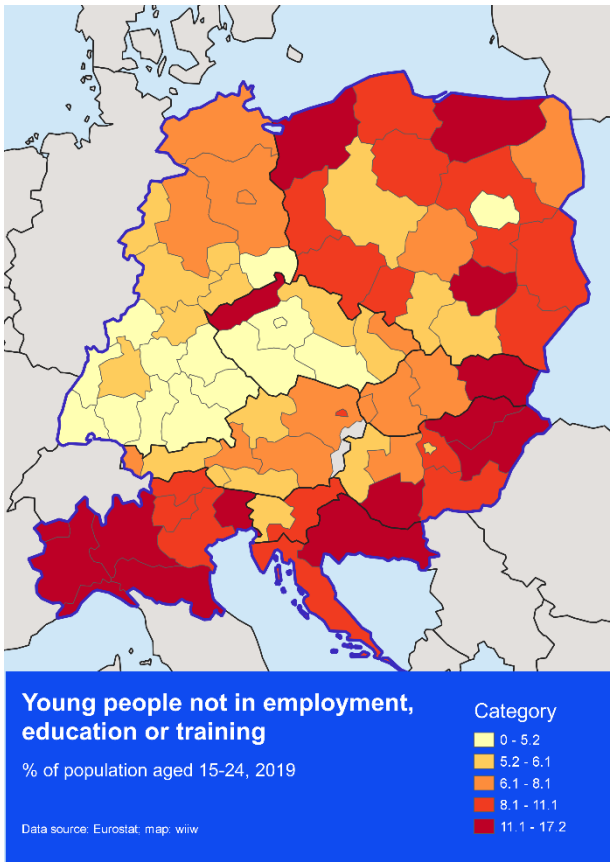
Source: Eurostat.

A main concern of EU policy is to promote the inclusion of younger individuals. Younger individuals who are not integrated into the labour market and are not in education or training are highly vulnerable to become left behind and to stay excluded from social and civic life even in the future[185]. The Youth Employment Initiative aims at improving the employability and labour market integration of disadvantaged younger individuals.

The distribution of young people not in employment, education or training (NEET) is presented in Figure 68. Central Europe regions show again a heterogeneous pattern across countries, but also within countries. Higher NEETs can be identified in a number of regional clusters. While Italy and Croatia face the problem of an overall high rate, in Hungary (North-East and South), Slovakia (Východné Slovensko), the Czech Republic (Severozápad) and Poland (in particular Warmińsko-Mazurskie) NEETs are more spatially concentrated in specific regions within countries.

[185] OECD, 2017.

Figure 68: Young people not in employment, education or training 2019, in % of population aged 15-24

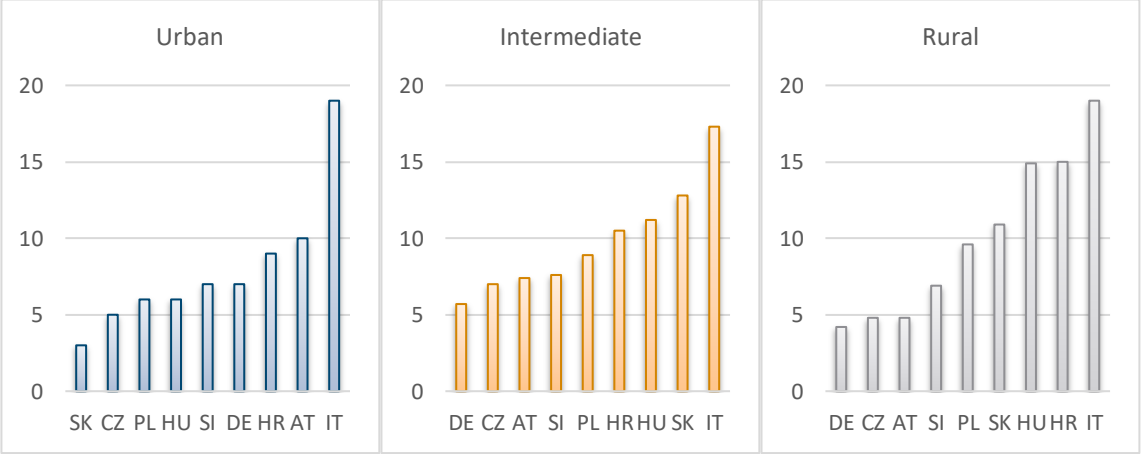


Source: Eurostat.
Notes: AT34, DED2, SK01 – 2017.

Regional differences within countries become even more pronounced by exploring overall urban-rural differences. The share of NEETs tends to be higher in urban regions in Austria, Slovenia and Italy[186]. Conversely, NEETs are concentrated in rural areas in Croatia, Hungary, Poland and Slovakia.

[186] In Italy, the overall high share is again to a large extent determined by poor performance in Southern regions.

Figure 69: Young people not in employment, education or training 2018/2019, in % of population aged 15-24 by urbanisation degrees



Source: Eurostat.

These findings highlight again the need to take local needs into account, as the corresponding challenge is rather specific to certain regions within central Europe countries.

5.4.2. Policy needs and potentials

Although the European Union represents one of the most affluent regions on a global scale, a significant number of individuals is still at risk of poverty and social exclusion. Disparities are not only visible across central Europe countries but especially across regions within central Europe countries. In most central Europe countries, risk of poverty and social exclusion is concentrated in a few regions, mostly less prosperous regions, where disadvantaged societal groups tend to be relatively overrepresented. A further vulnerable group to poverty and social exclusion are young individuals who are not in employment, education or training (NEET). The central Europe territory shows a high spatial concentration of NEETs. Although the EU has already put a lot effort into reducing the number of NEETs, it still represents a crucial challenge.

Starting in 2014, many EU countries have experienced a large influx of refugees. In this respect, the major challenge has been to promote the integration of those individuals who stay in the countries[187]. Difficulties in the labour market integration of those individuals can make poverty and social exclusion even more challenging.

Combating social exclusion has marked one of the most important goals of EU policy. Various actions, mostly within the framework of the ESF, have been launched to improve the inclusion of disadvantaged societal groups, most notably, younger individuals and migrants. The major part thereof however focuses on national strategies and does not explicitly promote TNC. The analysis at hand however sheds light on potentials for TNC. Social exclusion of disadvantaged groups is not a challenge that is specific to a particular country, but is of concern in all central Europe countries. In particular, less prosperous regions face the challenge of social exclusion.

[187] DG Region, 2017.

A number of projects have already been carried out within the Interreg CENTRAL EUROPE Programme that underline the vital role of TNC to tackle social exclusion. These projects aim to create ideas together to solve local social challenges, and to stimulate know-how transfer as well as facilitate business cooperation across central Europe countries. For example, the current Interreg CENTRAL EUROPE project SEE ME IN aims at strengthening entrepreneurship among migrants. A core element of the project is to develop an online platform that allows circulating know-how and provides access to key tools for executive management. A further interesting example is the 2007-2013 Interreg CENTRAL EUROPE project which addressed innovative housing and homecare solutions for people with disability and their families. One crucial step in the project was it to set up local support groups involving local stakeholders from the public and civil sector that provide, among other activities, assistance for new technical solutions. One of the major project outputs was a detailed strategy and a toolkit to make solutions also transferable to other regions.

These projects underscore the importance of TNC for solutions to deal with social challenges. Communication platforms can be beneficial when it comes to business collaborations as well as know-how and skill transfers. This is of particular concern for social enterprises. Information events can help to promote these enterprises and their products and generally increase the awareness among the local society. Moreover, promotion events can inform young individuals about local education, learning and employment possibilities and bring them together with local stakeholder, including the local industry. Such events further allow identifying local needs and potentials for solutions. This is particularly important for individuals who face multiple disadvantages, as innovative and tailored solutions are essential for their substantial labour market integration. Beyond that, concepts for local mentorships can be developed which allow valuable support and guidance for a successful integration into the local labour market.

The transfer of know-how and solutions between partners with different cultural and institutional backgrounds can encourage and stimulate the creation of even more innovative ways to tackle social exclusion. Moreover, combating a common challenge together can improve a common sense of belonging. The involvement of local stakeholders brings the EU closer to its citizen (see Chapter ‘EU closer to its citizen’ PO5). This is of particular interest for the inclusion of disadvantaged groups as those groups tend to have a lower trust in political institutions.

5.5. ENSURING EQUAL ACCESS TO HEALTH

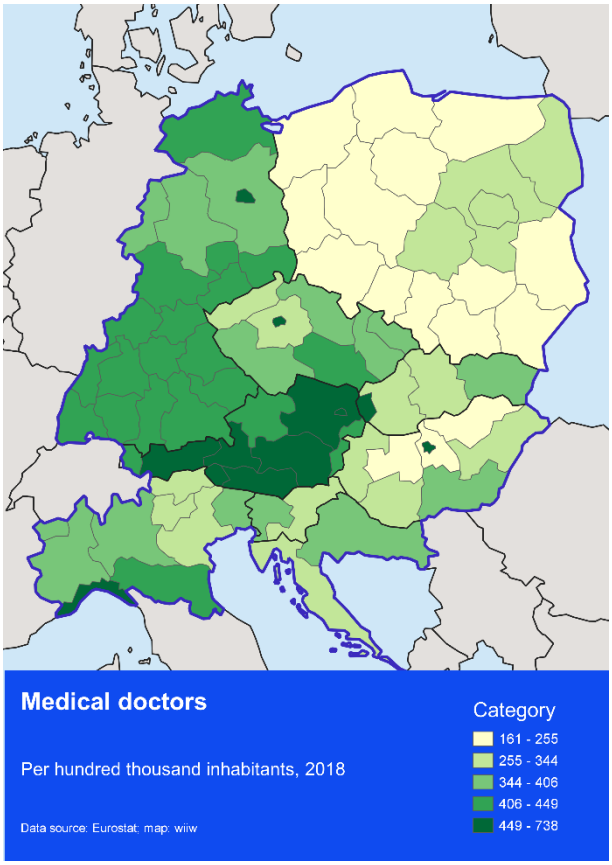
5.5.1. The challenge

A further aspect of social inclusion concerns the accessibility to public social services, most notably services of general economic interest (SGEI) including health care, childcare, elderly care and social housing. Being economically and socially excluded often corresponds also to a limited access to such services. The European Commission specifically promotes the provision and quality of SGEIs. The European Pillar of Social Rights defines specific principles on SGEIs to provide and ensure social protection and inclusion. In addition, the Social Investment Package proposes explicitly SGEIs as a target field for social investments.
One of the most important SGEI represents health care services which are also highlighted explicitly in the European Pillar of Social Rights.

An overall measure to capture health care services represents the number of healthcare personnel available in a region. Differences in the availability of healthcare personnel are expected to have implications for health

care services. An equal access to health care services requires the supply of an adequate number of a health care workforce[188]. Figure 70 maps the number of medical doctors per hundred thousand inhabitants in central Europe regions in 2018. To some extent, a divide is visible: a higher density prevails in Austria, Germany and Italy; while most regions in other central Europe countries show a lower density. In particular, in Poland and Hungary regions reveal predominantly low numbers of medical doctors that are well below the EU-28 average.

Figure 70: Medical doctors 2018, per hundred thousand inhabitants



Source: Eurostat.
Notes: CZ – 2013.

Health care services also depend crucially on the availability of resources. Although there have been calls for improving the efficiency of health care expenditures and reducing wasteful spending[189], a low level of medical infrastructure and facilities indicates the availability of a lower level of health care services.

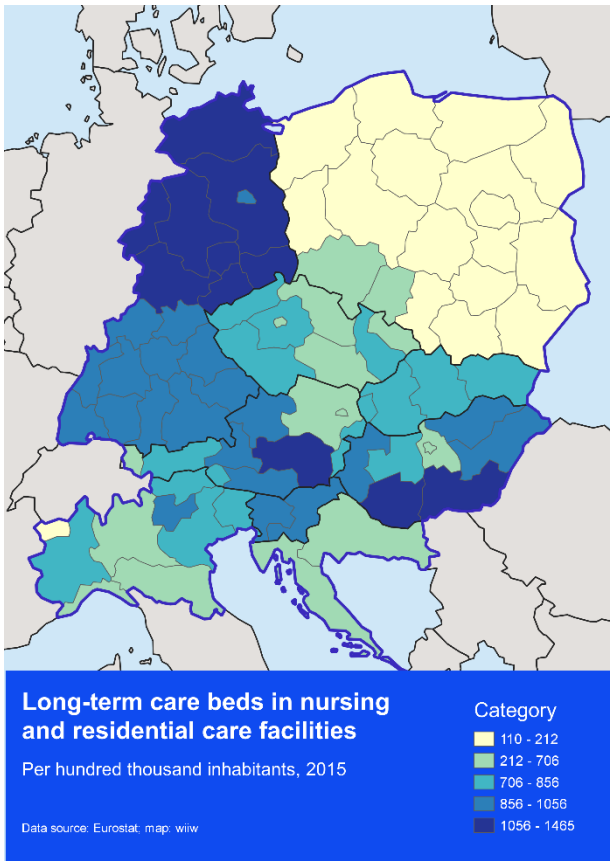
Figure 71 illustrates the availability of long-term care beds in central Europe regions. Overall, the number of long-term care beds varies substantially across central Europe regions. A pattern between North/South and the central Europe countries is visible: Poland and Croatia reveal the availability of a relatively low number of long-term care beds as compared to more central Europe countries. Regions with a higher number of long-term care beds can be found in Austria, Germany, the Czech Republic, Slovenia and Hungary. Interestingly,

[188] OECD/EU, 2018.
[189] OECD/EU, 2018.

only Germany reveals a clear within-country divide: former Eastern German regions (with the exemption of the city of Berlin) show a higher number of long-term care beds than former Western German regions.

Another important aspect of long-term care concerns home-care services. Such services play an important complementary role for long-term care. The European Pillar of Social Rights promotes explicitly affordable long-term care services of good quality, in particular home care and community-based services.

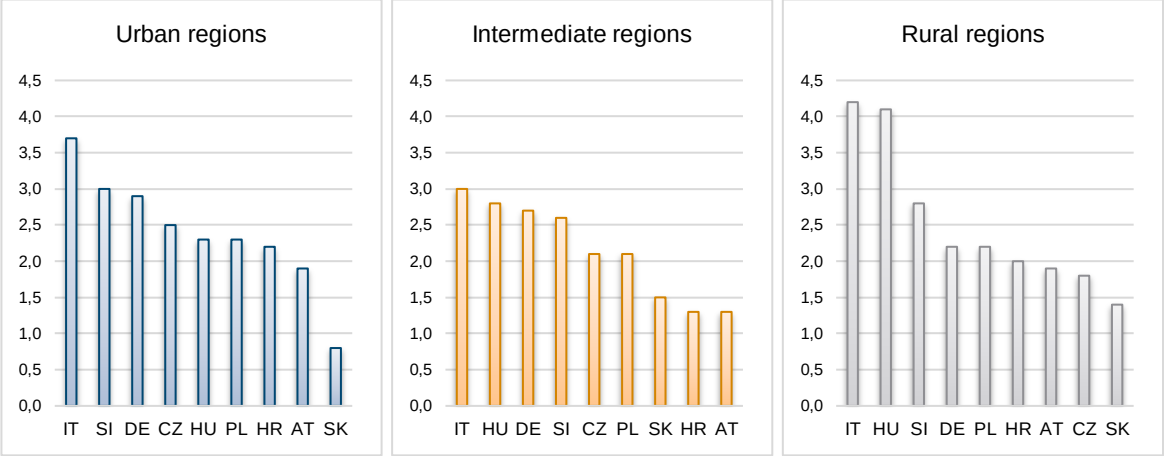
Figure 71: Long-term care beds in nursing and residential care facilities 2015, per hundred thousand inhabitants



Source: Eurostat.
Notes: SI, SK – 2011.

Figure 72 illustrates the share of individuals who make use of home care services in 2014 in rural, intermediate and urban regions. Although the patterns in the three urbanisation types look quite similar, there are interesting differences across countries. While Austria, Germany, Poland and Slovakia reveal balanced shares across regions, shares tend to be higher in urban regions in the Czech Republic and Croatia and in rural areas in Hungary, Italy and Slovakia. Overall, the shares of home care services users are relatively low. However, as life expectancy has been on the rise, the availability and affordability of home care services is expected to become even more relevant in the near future.

Figure 72: Self-reported use of home care services 2014, in % of total population by urbanisation degree



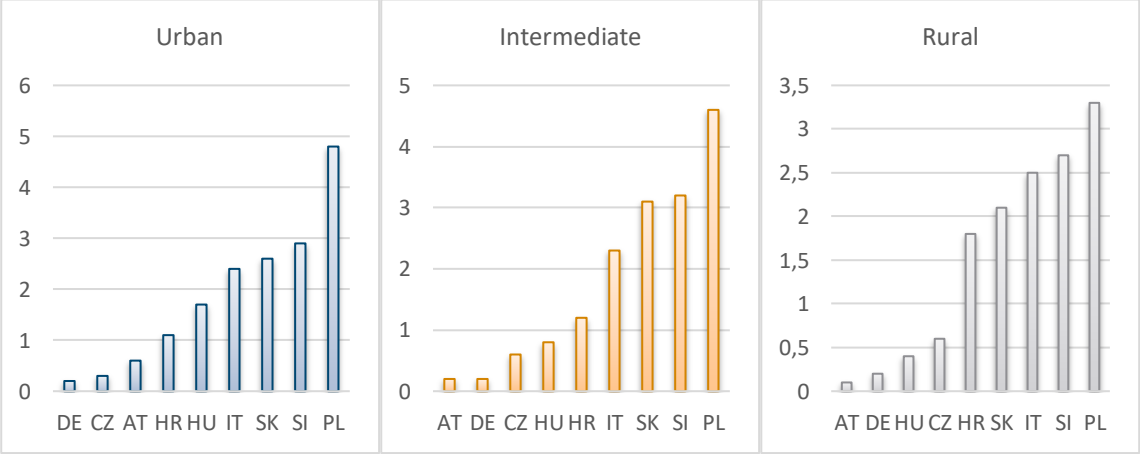
Source: Eurostat.

To provide an assessment of the quality of health care infrastructure, it is worthwhile to analyse whether individuals were satisfied by the supplied resources. To do so, self-reported information is used on unmet needs for medical examination. Focusing on the category “too expensive or too far to travel or waiting list’ allows drawing valuable conclusions on the quality and availability of health care resources in central Europe countries.

Figure 73 shows the proportion of self-reported unmet needs for medical examination, due to the above discussed reasons, in 2018 for rural, intermediate and urban regions in central Europe countries. Although the shares are relatively low, considerable differences are visible within all three urbanisation regions. By comparing the patterns in the three urbanisation types, a robust pattern can be identified. While Poland, Slovenia, Italy and Slovakia show a predominantly high share of unmet needs for medical examination, the rates are always lower in Austria, Germany, Hungary and the Czech Republic. Only Croatia shows a significant change across urbanisation regions, where unmet needs for medical examination are higher in rural regions.

By comparing these findings with those for health care personnel and infrastructure, there is, at least to some extent, a relationship observable. For instance, in Poland and Slovakia as well as partly in Slovenia and Italy, a comparably low availability of medical doctors and long-term care beds coincide with a lower perceived satisfaction with health care services. A correlation is also visible in Austria and Germany: a higher availability and a higher perceived content. Conversely, the patterns in Hungary, the Czech Republic and Croatia do not suggest such a correlation. Thus, a higher perceived content is not always related to a high availability of health care personnel and infrastructure.

Figure 73: Self-reported unmet needs for medical examination due to 'too expensive or too far to travel or waiting list' 2018, in % of population aged 16 and above



Source: Eurostat.

5.5.2. Policy needs and potentials

Services of general interest are essential to provide individuals an adequate standard of living. This is of utmost importance in particular for disadvantaged societal groups. An equal access to services of general interest plays therefore a vital role.

In the central Europe territory, the distribution of medical doctors suggests an unequal access to health care services. Even within countries, considerable differences across regions are noticeable. Likewise, a look at health care infrastructure also indicates a poor performance in some central Europe countries. The availability of long-term care beds shows a clear disparity between North/South and the central Europe countries. Moreover, in some central Europe countries individuals see needs for improvements with respect to health care services.

As highlighted above, the EU has already addressed social policy, including investments in services of general economic interest, in various ways. Nevertheless, there are also potentials for TNC with respect to health care services. The current Interreg CENTRAL EUROPE project I-CARE-SMART[190] comprises a collaboration between regional institutions, the local business sector and senior citizens that promotes effective and innovative solutions for older people with respect to health care and social assistance. The major goal of the project is to adapt the offer of services for elderly to fulfil the user needs. This clearly shows how collaborations between local citizens, public authorities and the business sector can help to create innovative solutions to meet local needs. A further example is the 2014-2020 Interreg CENTRAL EUROPE project INTENT[191], which promotes solutions for innovative patient-centred cancer care. Local partners from the private, public and civil sector work together on best practise solutions to improve existing systems and establish a know-how centre allowing a transfer of knowledge and tools. This illustrates again, how TNC can promote the creation of bottom-up solutions. Another relevant project is the already finished Interreg

[190] https://www.interreg-central.eu/Content.Node/I-CARE-SMART.html
[191] https://www.interreg-central.eu/Content.Node/INTENT.html

CENTRAL EUROPE project digitalLIFE4CE[192], which connects local partners from different areas to address digital-integrated healthcare systems. It specifically aims at improving the awareness of possibilities for providers and beneficiaries alike, promoting best practise and encouraging investments for further innovations in this field.

These projects highlight the crucial role of transnational platforms to transfer know-how and ideas for combating common problems. The involvement of local players allows creating tailored solutions to meet local needs. The direct collaboration between providers as well as developers and final users allows creating user-focused solutions via co-creation approaches which subsequently triggers innovation. Local support groups can further provide assistance for new technical possibilities. Moreover, cross-country collaborations in the area of business and research allow exploiting important spillover and network effects.

[192] https://www.interreg-central.eu/Content.Node/digitalLIFE4CE.html

6. A EUROPE CLOSER TO CITIZENS (PO5)

6.1. INTRODUCTION

This chapter analyses challenges, policy needs and potentials regarding policy objective 5: "A Europe closer to citizens by fostering the sustainable and integrated development of urban, rural and coastal areas and local initiatives". This objective is comprised of two specific objectives[193]:

i. integrated social, economic and environmental local development, and cultural heritage, tourism and security in **urban** areas
ii. integrated social, economic and environmental local development, and cultural heritage, tourism and security in **areas other than urban areas**.

Thus, the two specific objectives are identical, except for whether they address urban areas or not. From a perspective of territorial development, it is helpful to consider urban and rural regions jointly, especially if used in a functional territory context. Therefore, the analysis of PO5 "A Europe closer to citizens" will simultaneously look at the two specific objectives, discussing the main related challenges and identifying the respective policy needs and potentials.

For the analysis we identify two main challenges for **bringing Europe closer to its citizens**:

- The need for a more holistic, **inter-sectoral perspective including a social, economic, environmental and cultural dimension**: what we also call the multidimensionality of challenges in the following.
- Low and/or declining **perceptions of the EU's legitimacy**.

6.2. INTEGRATED SOCIAL, ECONOMIC, ENVIRONMENTAL AND CULTURAL DEVELOPMENT: MULTIDIMENSIONALITY

6.2.1. The challenge

Our territorial analysis of the main challenges within the scope of the sectoral policy objectives (PO1 to PO4) demonstrates that most territories are affected by a multitude of challenges. Furthermore, these challenges are not bound to single administrative units, but rather occur in functional areas characterized by economic, social, environmental as well as governmental linkages. The **multi-causality of processes and factors that shape development within functional areas** concerns regional development within urban areas and outside of urban areas alike[194][195]. It is important to recognise these interactions of sectoral developments and policies, since developments in one area might be undermined by poor performance in other areas[196]. Furthermore, territorial challenges are not necessarily the sum of sectoral challenges, as history, context, and path

[193] EU Commission, 2018
[194] Barca et al., 2012; ESPON, 2017, 2018; Iammarino et al., 2019; Milojevic, 2018; Tornberg, 2011
[195] Recently, the discussion of inner peripheries, characterized as "very individual hybrids, each created by a unique history, multiple factors/processes, and context-related elements" (ESPON 2017), reflects the shift in understanding from monocausality to multicausality (see ESPON, 2013; ESPON 2017; Humer, 2018)
[196] Barca et al. 2012

dependency shape their interaction. This poses the problem of how to assess the extent of these challenges. A comprehensive and multidimensional perspective is necessary to analyse and visualise the multidimensionality of processes and factors shaping the regional development of functional areas. ESPON (2018) presents two approaches for assessing impacts of integrated territorial and urban development strategies, which are useful for understanding corresponding challenges from a territorial point of view. Following these approaches, challenges can either be measured through assessing the territoriality of various sectoral aspects, for example by using composite indicators comprising multiple sectoral challenges. Additionally, explicitly non-sectoral policy indicators can be used to capture a broader range of developments from a spatial/territorial point of view.

As the preceding chapters have already provided an overview on the sectoral challenges within the Interreg CENTRAL EUROPE programme region, this chapter implements the latter approach of using territorial policy indicators (as opposed to sectoral indicators) to visualize the main joint challenges within central European areas. These policy indicators do not specifically focus on one sectoral aspect but try to capture the **multidimensionality of challenges** within regions. Since these indicators are targeted at impact evaluation and monitoring of policies[197], they are also suited to identify territorial challenges and regions, where integrated territorial development efforts might have the most impact. Furthermore, because of the importance of cultural heritage and tourism for the Interreg CE region[198], which is referred to in PO5, we include these in our analysis of the multidimensionality of processes and factors that shape regional development.

The following policy indicators have been selected to assess the multidimensionality of challenges across the Interreg CENTRAL EUROPE territory:

- The average yearly net migration rate from 2016 to 2019 as percentage of the average total population between 2016 and 2019[199]
- The average yearly natural population change from 2016 to 2019 as percentage of the average total population between 2016 and 2019
- The average yearly long-term unemployment rates from 2016 to 2019 as percentage of the average total unemployment between 2016 and 2019
- Number of nights spent at tourist accommodation establishments 2017 per 1000 inhabitants

Figure 74 depicts the average yearly net migration rate between 2016 and 2019 and the average yearly rate of natural population change from 2016 to 2019 on the NUTS 3 level.

First, we focus on the net migration rate. The net migration rate captures the net outcome of immigration and emigration processes. It reflects a range of factors across multiple domains underlying the choices of immigration or emigration. Thus, it can be used as a proxy for the “overall attractiveness of a region in terms of labour markets, education, quality of life, welfare, infrastructure, etc.” (ESPON, 2018).

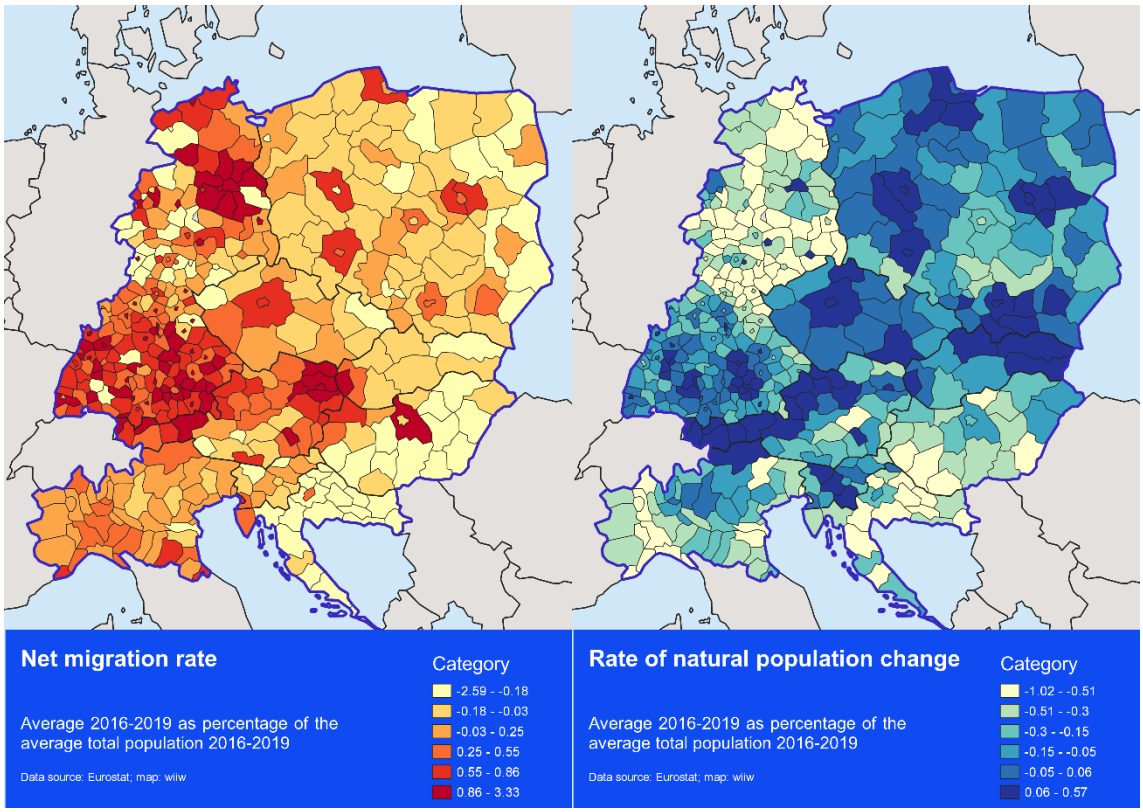
Particularly strong negative net migration rates are visible throughout most of Croatia, eastern Hungary and eastern Poland, which are characterized by strong east-west gradients in net migration rates. Regions with strongly positive net migration rates are found in and around Berlin, Bratislava and Vienna, around Budapest

[197] ESPON, 2018
[198] Dugulan et al. 2010
[199] The data for this and the following indicators has been averaged over these years to reduce the influence of extreme values in single years.

and most of southern Germany. A division between mostly rural regions versus urban regions and/or their neighbouring regions can be observed throughout the Interreg CENTRAL EUROPE countries. Apart from regions in Germany and Austria, positive net migration rates are mostly limited to cities or their adjacent regions.

In general, the Interreg CENTRAL EUROPE urban areas[200] are characterized by a net migration rate of 0.5%, while intermediate regions show a net migration rate of 0.35%, and rural areas have a net migration rate of 0.15%. But two opposing patterns emerge regarding urban areas and their surroundings. While urban areas, particularly capital cities, are usually characterized by more positive net migration rates, the major urban regions in Poland are characterised by lower net migration rates than their surrounding regions, as is also the case with Budapest and its surrounding regions. The latter observations might indicate tendencies of urban sprawl, as other analyses show in more detail[201]. While the data shows that there are diverging patterns of net migration rates along the lines of rural versus urban regions, the territorial also indicates that these patterns are reversed in some cases and that some cities might be particularly affected by a combination of challenges across multiple dimensions.

Figure 74: Average yearly net migration rate (left graph) and average yearly rate of natural population change (right graph) 2016 – 2019 in % of the total average population 2016 – 2019



Source: Eurostat, Maps: wiiw

[200] Regions classified according to Eurostat Urban-Rural Typology: https://ec.europa.eu/eurostat/web/rural-development/methodology
[201] Kovács et al., 2019; Lityński, 2016; Źróbek-Różańska & Zadworny, 2016

We now turn to the natural population change also displayed in Figure 74. The natural population change describes the difference between the number of live births and deaths. It serves as an indicator for the extent to which the socioeconomic conditions, infrastructure and public services within a region are favourable for starting a family and captures young people seeing a future in the particular region[202]. Thus, it can also be understood as a prospective indicator capturing the perceived future attractiveness of a region.

Regarding the rate natural population change it is evident that over 75% of regions within the Interreg CENTRAL EUROPE countries are characterized by a negative natural population change. Regions with particularly strong negative rates of natural population change of approximately -0.5 to -1% per year are concentrated in eastern Germany, southern Hungary, north-western Italy and Croatia. In contrast, only about 25% of regions are characterized by positive yearly rates of natural population change. These are mostly located in in north-western Austria, Czech Republic, Poland, Slovakia, and southern Germany.

In general, urban regions tend to be enclaves of positive rates of natural population change. However, the urban-rural split is not clear cut, as for example Łódź and Budapest are characterized by strong negative rates of natural population change, which illustrates the importance of place-sensitive policy approaches. Overall, the Interreg CENTRAL EUROPE urban areas[203] are characterized by an average natural population growth rate of -0.08%, while intermediate regions show a population growth rate of -0.22%, and the average natural population growth rate in rural regions is -0.24%. This confirms that positive rates of natural population change are more likely to be found in predominantly urban regions and intermediate regions. Still, the distributions also illustrate that challenges regarding a negative development of the natural population within the Interreg CENTRAL EUROPE NUTS3 regions are not necessarily limited to rural and intermediate regions.

When contrasting both indicators we can see that overlaps of challenges regarding quality of life, welfare, labour markets, education, infrastructure, and public services are strong in Croatia, southern Hungary and eastern Germany. To a lesser extent, these overlap in north-eastern Italy, Slovakia and eastern Poland.

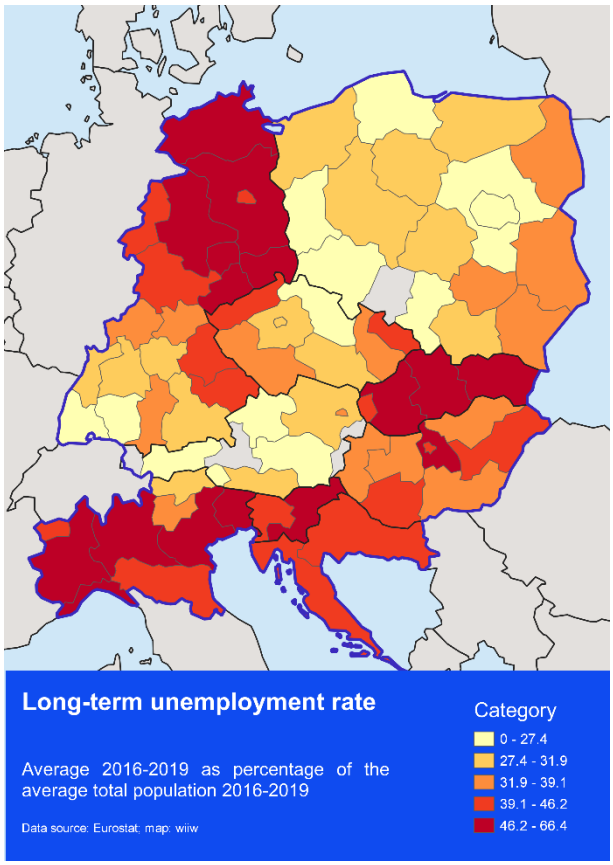
The analysis of the average yearly long-term unemployment rate[204] from 2016 to 2019 on the NUTS2 level (see Figure 75) might shed some light on possible (structural) economic problems underlying the developments observed above. In contrast to the total unemployment rate, the long-term unemployment rate serves as a proxy for persistent structural economic problems and reflects the inclusiveness of economic development[205].

The proportion of long-term unemployment in total unemployment within the NUTS2 regions varies between approximately 20 to 67%. The biggest challenges regarding long-term unemployment can be found in Slovakia, where all regions apart from the Bratislava urban area are characterized by long-term unemployment rates of above 50% of total unemployment. Furthermore, Saxony, Saxony-Anhalt and Brandenburg in eastern Germany, Lombardy, Piemont and Veneto in northern Italy as well as Eastern Slovenia and central Hungary show long-term unemployment rates of above 48% of total unemployment. Croatia, southern Hungary and eastern Poland show high long-term unemployment rates of approximately 35

[202] ESPON, 2018
[203] Regions classified according to Eurostat Urban-Rural Typology: https://ec.europa.eu/eurostat/web/rural-development/methodology
[204] Defined by Eurostat as being 12 months or more of unemployment
[205] ESPON 2018

to 50% of total unemployment, which can also be found in most of the remaining NUTS2 regions in eastern Germany and northern Italy.

Figure 75: Average long-term unemployment rate 2016-2018 as % of average total unemployment 2016-2019



Source: Eurostat, Maps: wiiw

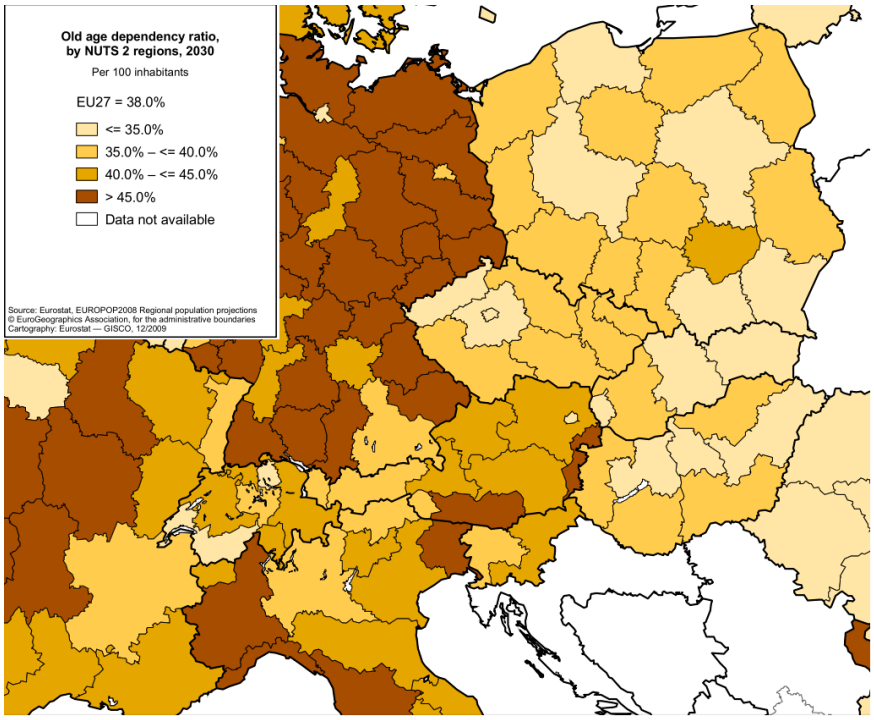
Interestingly, the patterns of long-term unemployment do not particularly coincide with the patterns regarding the net migration rate and the rate of natural population change, except for eastern Germany and to some extent northern Italy, highlighting the multi-causality of factors that shape regional development. This also reflects parallels to developments across multiple domains observed in previous chapters, e.g. the development of production networks across borders and a concentration of the service economy in urban centres.

While trends in regional migration patterns and long-term unemployment are hard to foresee, trends regarding the natural population change are relatively stable[206] and its developments are likely to pose a particularly strong challenge to Interreg CENTRAL EUROPE countries[207]. The prospective character of the natural population change indicator argued by ESPON (2018) indicates that the multitude of challenges these regions are facing are long lasting. Furthermore, regions facing these challenges today will be prone to encounter

[206] wiiw, 2018
[207] Giannakouris, 2010

challenges like a high old age-dependency ratio in the future[208], e.g. in eastern Germany, as anticipated in regional population projections.

Figure 76: 2030 projected old age dependency ratio (EUROPOP 2008)

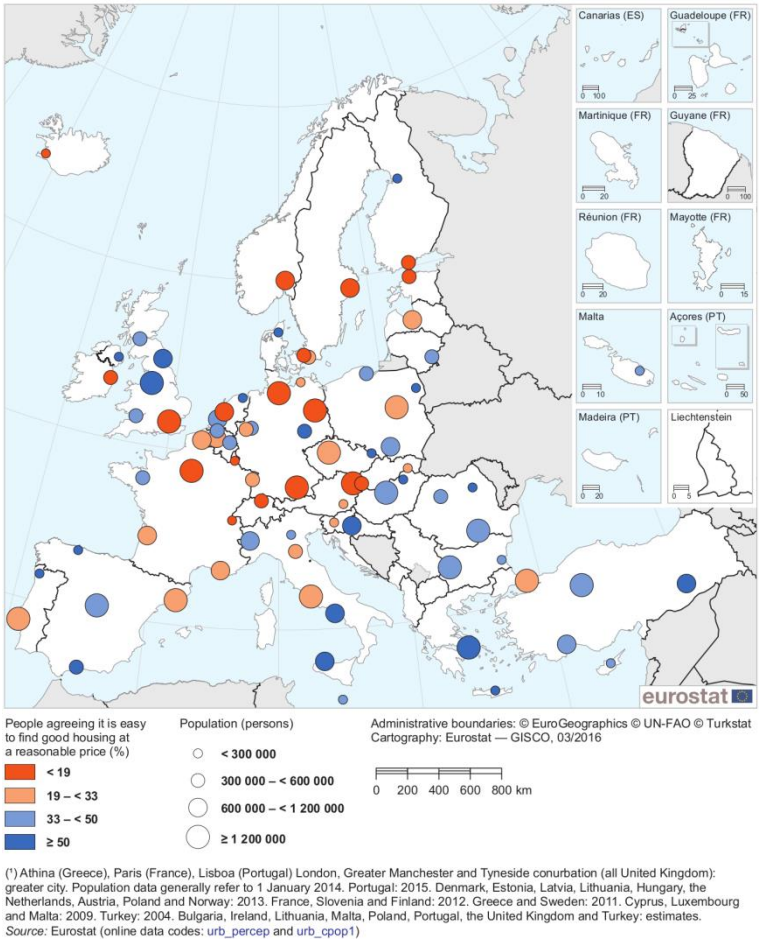


Source: Giannakouris (2010)

Lasting trends in natural population change, net migration and long-term unemployment will likely entail further consequences with a strong territorial dimension. On the one hand, many shrinking regions face the challenge of how to provide quality services of general interest, as evident from the analysis in previous chapters on mobility (4.4.), quality services in education, training and lifelong learning (5.3.) and health services. (5.5.). On the other hand, some regions (mostly major cities) are facing strong population growth, which in turn poses a challenge regarding environmentally and socially sustainable cities. The latter is evident in increasing average rent in many European cities and the perception that it is quite hard to find good housing at a reasonable price in their city (see Figure 77).

[208] Haller & Verwiebe 2016

Figure 77: Proportion of people who agree that it is easy to find good housing at a reasonable price in their city in %, 2015[1]



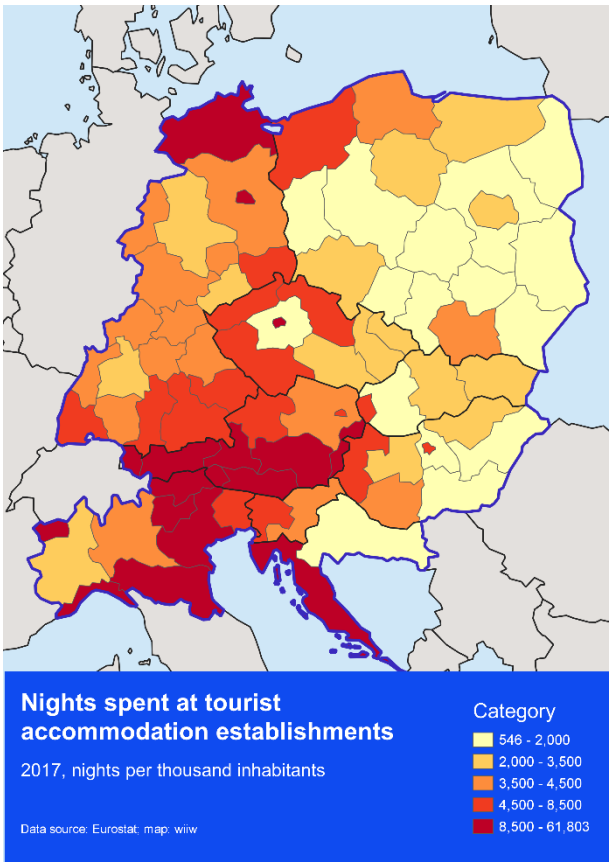
Source: Eurostat, 2016

The divergence of patterns between regions further stresses the point that these challenges should be addressed jointly by regions facing challenges at both ends of the spectrum.

Figure 78 shows the number of nights spent at tourist accommodation establishments in 2017. Narrowly defined, this indicator depicts a regions competitiveness regarding their travel and tourism sector. It might also be understood to reflect a regions economic potential regarding cultural heritage and natural resources, but existing analysis shows that the link between cultural heritage, natural resources and competitiveness regarding the travel and tourism industry is not straight forward[209]. Knowledge of strategies and capacities for an effective utilisation of these preconditions is essential for the Interreg CE countries to transform these factors into driving forces of their travel and tourism competitiveness [210]. For example, Poland scores high on the cultural resources dimension of the Travel and Tourism Competitiveness Index (TTCI)[211], however, the nights spent at tourist accommodation establishments are very low in comparison to most other countries.

[209] Dugulan, 2010; Ismagilova, 2015; Lo et al., 2017
[210] Dugulan et al. (2010)
[211] World Economic Forum (2019)

Figure 78: Nights spent at tourist accommodation establishments 2017, per thousand inhabitants



Source: Eurostat

6.2.2. Policy needs and potentials

The territorial analysis has identified areas that are particularly affected by a multitude of challenges. Moreover, there is no reason to believe that the multi-causality of processes and factors that shape development within functional areas might decrease in the future. Thus, the multidimensionality of challenges as well as history and path dependency must be considered in future policies[212].

Regarding EU cohesion policy, these realizations became evident in the Territorial Agenda of the European Union 2020 (2011) and reflect in the promotion of integrated territorial development, which was one of the innovative elements of the 2013 reform of cohesion policy[213]. The Territorial Agenda of the European Union 2020 (2011) states the following priorities for future EU policies:

- Promote polycentric and balanced territorial development
- Encourage integrated development in cities, rural and specific regions
- Territorial integration in cross - border and transnational functional regions

[212] Barca et al. 2012
[213] Ferry et al., 2018;

- Ensuring global competitiveness of the regions based on strong local economies
- Improving territorial connectivity for individuals, communities and enterprises
- Managing and connecting ecological, landscape and cultural values of regions

The need for these polycentric and integrated development policies is directly derived from the multi-causal nature of spatial development and the complex character of spatial development[214]. As the Leipzig Charter notes as one of its core principles, challenges and policies in the domain of integrated development also need to pay attention to uneven economic, social, environmental and cultural development within functional areas.

Integrated development combines 'horizontal', inter-sectoral integration, with vertical integration, which relates various spatial and governance levels[215]. Our analysis renders both aspects essential to bringing Europe closer to its citizens. One the one hand, our analysis illustrates the need of using flexible functional geographies that "adapt the geographical level of analysis and implementation of policy to the challenges to be addressed" (EC, 2017). On the other hand, spatially relevant and vertically integrated projects are particularly suited to increase the visibility and acceptance of policy efforts.

In other words, the regional level is considered to be appropriate for place-based policies that take into account functional territories aspects, stakeholder participation as well as inter-sectoral approaches. Importantly, this regional level does not necessarily correspond to the administrative, sectoral division of governance as it potentially includes different policy areas as well as different types or levels of regions. Correspondingly, the regional level consists of the public authorities, public and private associations as well as informal institutions whose legitimacy is ensured by their members (e.g. municipalities, interest groups, NGOs). This level can act flexibly and task-oriented, but also needs professional management structures that have to be provided through top-down or bottom-up approaches. To implement these policies, it is likely necessary to further strengthen the spatial planning regimes in central European countries[216]. Cohesion policy can play an important role to provide such structures.

At the same time, this level is characterised by numerous dilemmas for which solutions are needed: e.g. cooperation versus competition, entrepreneurial innovation-oriented action versus careful use of taxpayers' money, or flexible functional spatial access versus action spaces with continuity in which identity and trust can emerge.

From this several questions for the future CENTRAL EUROPE Programme emerge:

- What are the topics and tasks for this regional level?
- Which of these topics are particularly suitable for transnational cooperation?
- What is already happening at this regional level and what future tasks would be appropriate?
- Which functional boundaries are appropriate?
- How can flexibility and continuity be combined?
- How can/should the dilemmas of the regional level of action be dealt with?

[214] Milojevic 2018, Ferry et al., 2018, Territorial Agenda of the European Union 2020 (2011)
[215] Milojevic 2018; Tornberg, 2011; BBSR, 2017
[216] BBSR, 2017

- What are appropriate governance framework conditions for horizontal and vertical networking, institutional embedding, organisational structures, decision-making mechanisms, funding, etc.?
- What experiences, examples have been made and could be transferred?

To address these needs transnational cooperation has to link up with two elements of Cohesion policy that are in the centre of PO5 “A Europe closer to citizens”, i.e. **Community-led Local Development** (CLLD) and **Integrated Territorial Investment** (ITI).

CLLD focuses on specific sub-regional areas, is led by local action groups composed of representatives of local public and private socio-economic interests and carried out through integrated and multi-sectoral area-based local development strategies, taking into consideration local needs and potentials.[217] Expected effects are to encourage local communities to a) develop integrated bottom-up approaches to respond to territorial challenges, b) stimulate entrepreneurship and innovation, and c) promote community ownership of programmes and projects.

ITI is based on integrated investment strategies for certain territories or functional areas, e.g. for urban development, but also for inter-municipal cooperation in specific territories. As an instrument ITI provides for integrated funding arrangements for investments under such strategies. Funding will be bundled from different sources, e.g. ERDF, ESF, different POs, SOs, that are involved in the integrated strategies.

Transnational cooperation holds a specific significance regarding the utilisation of cultural heritage to untap the potential of the travel and tourism industry throughout the Interreg CE territory. Our analysis above shows that existing cultural heritage and natural resources can provide a basis for generating employment effects by increasing the travel and tourism industries competitiveness[218]. But what’s more, it becomes evident that cultural heritage and natural resources have little impact on their own, because they are heavily dependent on knowledge on how to promote and employ these resources[219].

This poses a particular opportunity for knowledge transfers and mutual learning in the framework of transnational cooperation to promote the sustainable use of cultural heritage as a resource for the development of the travel and tourism industry.

In the 2007-2013 programming period, the SECOND CHANCE project, aimed at revitalising brownfield urban areas across five Interreg CE urban areas, has set an example on how these approaches might be implemented. First, a common transnational marketing study has been developed as a tool for generating a common sustainable strategy and generating visibility for cultural resources, which might be implemented in future projects. Furthermore, the project resulted in valuable pilot action leveraging a multiple of initial investments after the project period. More recently, the European Cultural Route of Reformation (ECRR) project[220] illustrates how the preservation, enhancement and promotion of cultural heritage throughout Central Europe can be utilised for economic development and tourism development in particular. It specifically employs mutual learning in more than 20 training events on the preservation and promotion of cultural heritage. This fills the gap between the existence of cultural heritage and its impact on economic development

[217] https://ec.europa.eu/regional_policy/en/information/publications/brochures/2014/community-led-local-development
[218] Dugulan, 2010; Ismagilova, 2015; Lo et al., 2017
[219] Dugulan, 2010
[220] https://www.interreg-central.eu/Content.Node/ECRR.html

and provides a template on how to build the missing link between cultural heritage and potential growth of the travel and tourism industry. The success of this strategy is indicated by the certification of the project output by the Council of Europe[221].

A strength of past Interreg CENTRAL EUROPE projects has been the ability to tackle common challenges beyond administrative and sectoral borders, as evident in the richness of cooperation programmes implemented and the impacts achieved[222].

Place-sensitive transnational cooperation projects hold the potential to tackle specific manifestations of these challenges across multiple locations, governmental levels and sectoral challenges. Moreover, since Interreg CENTRAL EUROPE projects are always implemented locally, they hold great potential to implement vertically integrated strategies of territorial development and can derive efficiency benefits from the horizontal integration of sectoral challenges.

Still, while there are many challenges that call for an integrated approach to territorial development, they give rise to the challenge of using the already relatively small funds efficiently and effectively. This highlights the role of pilot-scale projects, the capacity building, the exchange of knowledge regarding forms of CLLD and ITI, the development of integrated strategies and development plans as main activities for transnational co-operations to address the multi-causality problem of spatial development, contribute to territorial cohesion and bring Europe closer to citizens.

6.3. PERCEPTIONS OF EU LEGITIMACY

6.3.1. The challenge

Current patterns and trends of spatial polarization analysed in previous chapters are paralleled by another challenge in the domain of **bringing Europe closer to its citizens**. Several studies have shown that processes of spatial polarization are related to surges in political populism, challenges to perceptions of a common European identity and EU legitimacy[223], which in turn are hindering further European integration[224] and overall economic growth within the European Union[225].

Following the crisis, public support for further EU integration and perceptions of EU legitimacy[226] dropped significantly “as the markets pummelled one Member State after another, as EU policies pushing austerity and structural reform split the expected ‘rescuers’ from those needing ‘rescue,’ and as policy performance was characterized by economic slowdown and recession rather than growth” (Schmidt, 2015). But like the other challenges analysed above, the challenge of perceptions of vanishing EU legitimacy is not distributed evenly across countries and regions within the EU. Moreover, the relatively recent EU accession of most Interreg CENTRAL EUROPE countries and the continuing presence of the iron curtain in many people’s minds lends prime importance to the analysis of perceptions of the EU’s legitimacy within the Interreg CENTRAL EUROPE

[221] https://www.coe.int/en/web/cultural-routes/-/the-council-of-europe-certifies-5-new-cultural-routes
[222] SOGES spa – ERAC bv, 2012; wiiw, 2018
[223] Eichengreen, 2018; Gilens & Page, 2014; Rodríguez-Pose, 2018; Rodrik, 2018; Schmidt, 2013; Setterfield, 2018
[224] Capello & Perucca, 2018; Schmidt, 2015
[225] ESPON, 2017; Rodríguez-Pose, 2018
[226] Also discussed as Euroscepticism, see https://voxeu.org/article/global-lessons-euroscepticism

regions[227]. The following chapter analyses regional patterns in perceptions of EU legitimacy within the Interreg CENTRAL EUROPE territory using survey data that reflects the perspective of European citizens[228].

Following Schmidt (2013) we analyse perceptions of the EU's legitimacy based on three criteria: input legitimacy, throughput legitimacy, and output legitimacy:

- Input legitimacy refers to the participatory quality of governance processes and its preconditions, such as a thick collective identity and a 'European demos'.
- Throughput legitimacy focusses on the quality of governance processes of the EU, as indicated by efficacy, accountability, transparency, inclusiveness and openness to interest intermediation.
- Output legitimacy is derived from the actual problem-solving capacity of laws, rules and policies. Regarding perceptions of EU legitimacy, output legitimacy is also derived from the problem-solving capacity regarding individual, private or subjective needs, as opposed to 'real, collective and objective' needs, of regions[229]

While the breakdown of the challenges to EU legitimacy into these three areas is helpful for analytical clarity and deriving targeted policy implications, the proposed division is not distinct. Particularly when analysing people's perceptions, the different concepts will be interrelated, for example, due to feedback effects between perceptions of output and input legitimacy[230]. Furthermore, perceptions of the EU's legitimacy are not necessarily bound to objective measures[231]. We focus on the former, as the perceptions of the EU's legitimacy are most relevant to 'bringing Europe closer to its citizens'.

We analyse these perceptions based on the latest available Eurobarometer Data[232], which has been collected in September 2020 (N = 32,510). Data is available on the level of NUTS 2 regions for most countries and on the level of NUTS 1 regions in Germany and Italy. The "don't know"-responses have been excluded from the analyses to be able to generate average regional response scores based on the Likert-type scales. These account for approximately 1-10% of responses, depending on the question. We present statistics based on unweighted data since weights are not available for aggregation on the NUTS 2 level.

Input legitimacy

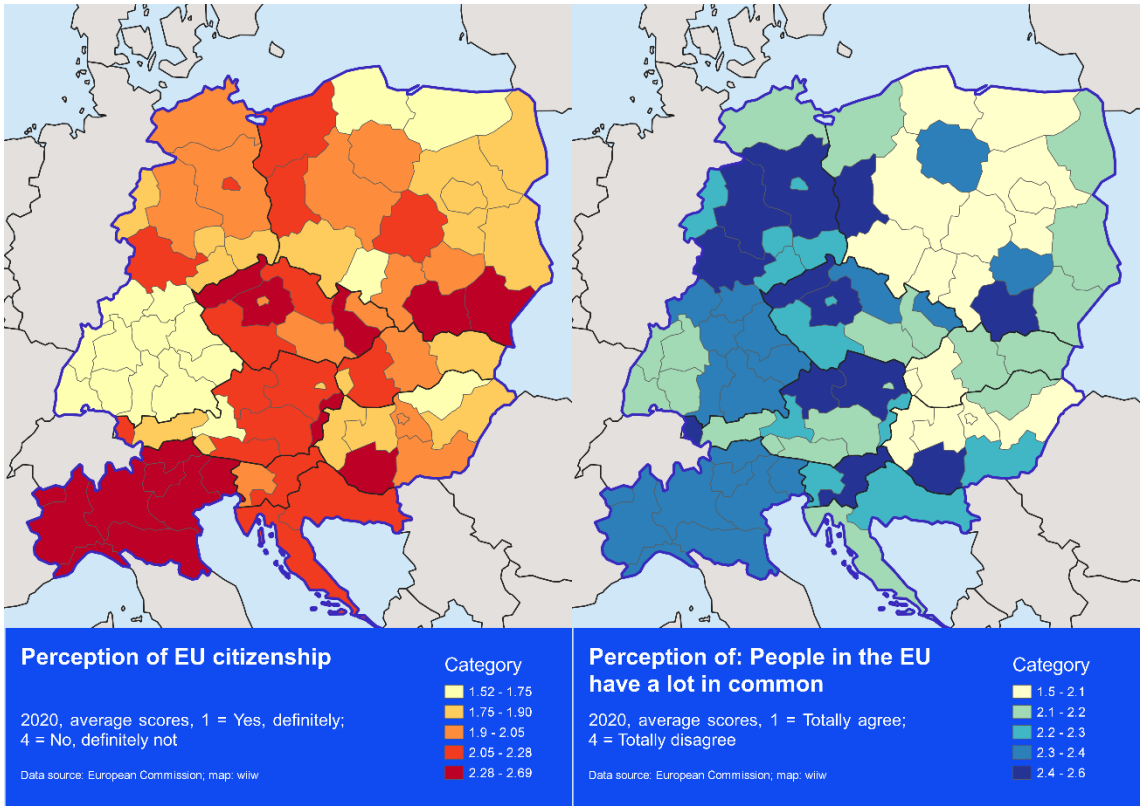
In the following, we analyse the respondents' perceptions of a collective European identity, their feelings of constituting a 'European demos' and how these might translate into actual electoral participation.

There are marked regional disparities in the extent to which preconditions are favourable for participatory EU governance processes. Figure 79 displays the average score of responses regarding the extent participants feel they are "a citizen of the EU"[233] and the average score of responses regarding their agreement with the statement that "People in the European Union have a lot of things in common"[234]. Regarding the former, the average scores within regions range from 1.5 to 2.7, and regarding the latter scores within regions range from 1.5 to 2.6. On average, feelings of being a citizen of the EU are the weakest in the Interreg CENTRAL

[227] Decoville & Durand, 2019; wiiw, 2018
[228] For a critical assessment of the Eurobarometer survey see Höpner & Jurczyk, 2015
[229] Capello & Perucca, 2018
[230] Capello & Perucca, 2018; Schmidt, 2013
[231] Harteveld et al. 2013
[232] EU Commission, 2019
[233] On a scale from 1 (Yes, definitely) to 4 (No, definitively not)
[234] On a scale from 1 (Totally agree) to 4 (Totally disagree)

EUROPE regions in Italy, Croatia, southern Hungary, Czech Republic and western Austria. Regions in Czech Republic, eastern Germany, southern Hungary, Austria and Slovenia are characterized by on average low approval of the statement that people in the EU have a lot in common, while particularly strong approval to the statement can be found in regions of Hungary, Poland and Slovakia.

Figure 79: Average response scores: EU citizenship and People in the EU have a lot in common



Source: EU Commission (2019), Maps: wiiw

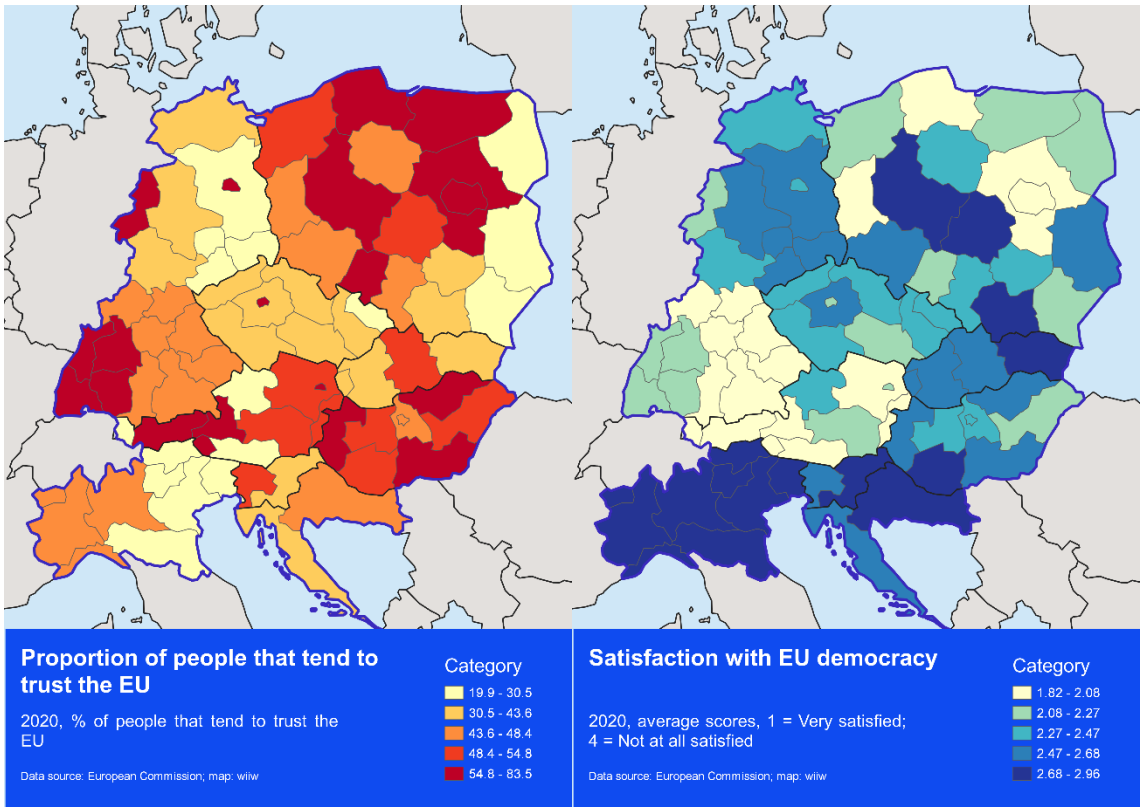
These data show a significant challenge to the Interreg CENTRAL EUROPE region, because they indicate that the EU's input legitimacy derived from perceptions of a common context of life is low in some regions.

Throughput legitimacy

Regarding the perceptions of the EU's throughput legitimacy we use indicators reflecting the respondents' perceptions of the EU's accountability, transparency and inclusiveness.

Figure 80 depicts the percentage of people that tend to trust in the European Union as an institution and the respondents' satisfaction with the way democracy works in the EU[235].

Figure 80: Average response scores: Trust in EU and satisfaction with EU democracy



Source: EU Commission (2019), Maps: wiiw

We assume that the respondents' trust in the EU at least partly reflects the respondents' perceptions of the EU's accountability and transparency[236]. Throughout the Interreg CENTRAL EUROPE territory the lowest rates of trust in the EU are located in Austria (Carinthia, Upper Austria and Vorarlberg) and Czech Republic. While Czech Republic is characterized by a relatively low percentage of people trusting the EU throughout the country (~30% overall), strong regional disparities in trust in the EU can be found in Austria, which, in general, is characterized by a much higher percentage of people trusting the EU (~47%).

The respondents' satisfaction with the way democracy works in the EU captures their satisfaction with EU governance processes. Respondents in Italy, parts of Poland, Slovakia, Slovenia and Croatia are least

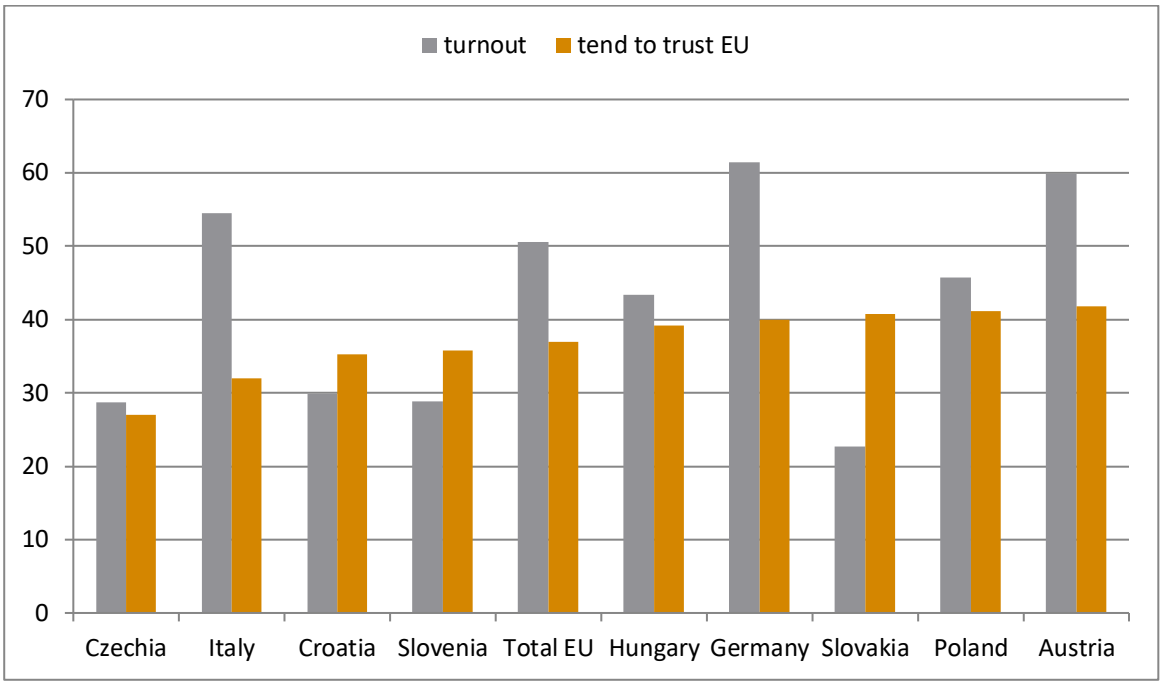
[235] On a scale from 1 (Very satisfied) to 4 (Not at all satisfied)
[236] Harteveld et al., 2013; Schmidt, 2015

satisfied with the way democracy works in the EU. Strong regional disparities in the satisfaction with the way democracy works in the EU can once again be found in Austria, Germany, but also in Poland.

Below, we analyse how these preconditions for participatory governance translate into actual electoral participation on the country level (Figure 81).

A relation between the preconditions for and actual participatory governance becomes evident. Lower percentages of people stating that they tend to trust the EU go together with a lower turnout in the recent European Parliament election across the Interreg CENTRAL EUROPE countries. The results for Slovakia are somewhat surprising, as the percentage of people stating that they tend to trust in the EU is among the highest within the Interreg CENTRAL EUROPE countries, while actual voter turnout in the European Parliament elections has been the lowest across all EU countries.

Figure 81: Turnout in European Parliament election and percentage of people that tend to trust the EU



Data source: EU Commission, 2019; https://election-results.eu/

While there does not seem to be a clear East-West gradient in the preconditions for participatory governance (i.e. institutional trust), this does seem to be the case when looking at the actual voter turnout data. This might suggest, that inefficient institutional arrangements are blocking the translation of preconditions into actual voting behaviour[237].

Output legitimacy

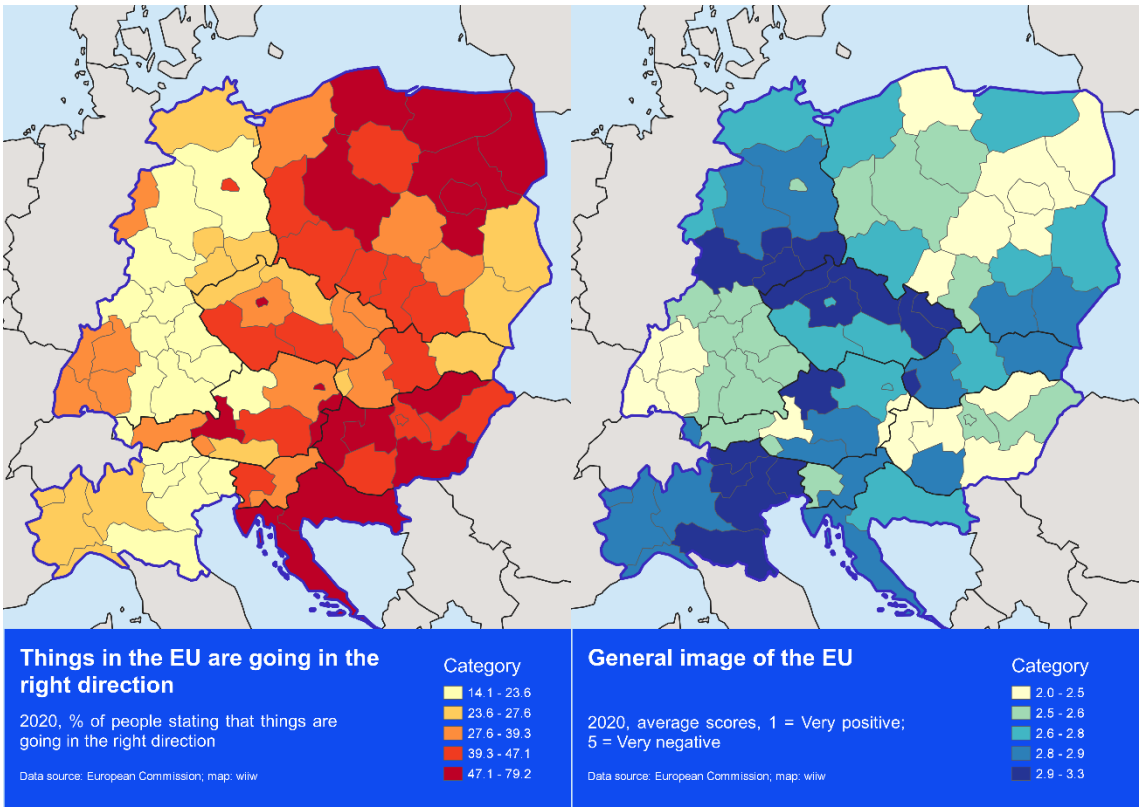
Perceptions of output the EU's output legitimacy depend on the actual and perceived performance of laws, rules and policies implemented by the EU. To capture the overall perception regarding the EU's output we rely

[237] See Capello & Perucca, 2018

on the respondents' perceptions of whether things in the EU are going in the right direction and their perceptions regarding the question: "In general, does the EU conjure up for you a very positive, fairly positive, neutral, fairly negative or very negative image?"[238] (Figure 82).

Patterns regarding output legitimacy resembling the insights derived regarding throughput legitimacy. Carinthia and Upper Austria (Austria), Brandenburg (Germany)and north eastern Italy are characterized by less than 24% of people claiming that things in the EU are going in the right direction.

Figure 82: Average response scores: things in the EU are going in the right direction and EU image



Source: EU Commission (2019), Maps: wiiw

Regions with the most positive perception of the general image of the EU are located in Austria, Germany, Hungary and Poland. Neighbouring regions with rather negative perceptions of the general image of the EU create a picture of strong regional disparities in Austria and Germany. On average, respondents throughout Czech Republic perceive the EU`s image as fairly negative. Once again, Carinthia and Upper Austria (Austria) as well as Southern Transdanubia (Hungary) emerge as regions with marked challenges regarding EU legitimacy, indicating an on average negative general image of the EU.

Overall, our territorial analysis of perceptions of the challenges regarding input, throughput and output legitimacy of the EU shows distinct regional differences in the extent to which the EU is perceived as legitimate and reveals potential starting points for the implementation of Interreg programmes. While there are certain overlaps across perceptions of input, throughput and output legitimacy, our analysis also indicates that

[238] on scale from 1 (very positive) to 5 (very negative)

there are marked differences in what part of the EU's legitimacy might be in question. Furthermore, it becomes evident that the challenge of perceptions of a low EU legitimacy is characterized by regional divergences within countries as well as between countries. There does not seem to be a clear east-west gradient in these perceptions that might arise from differences in the length of EU membership. Lastly, our analysis indicates that preconditions for a participatory governance might not readily translate into actual participatory democracy.

Future developments of perceptions of EU legitimacy in the EU are almost impossible to anticipate, and even more so on a regional scale. The most recent data for the EU suggests positive trends regarding for example the number of people that tend to trust the EU or the number of people that have a positive general image of the EU[239]. However, external risks and likely economic slowdown throughout the Interreg CENTRAL EUROPE territory[240] might pose challenges to the EU's output legitimacy. Furthermore, political processes of further European disintegration[241] might affect perceptions of a common European identity and solidarity negatively through feedback effects, and thus undermine perceptions of the EU's input legitimacy.

6.3.2. Policy needs and potentials

The 2016 Brexit vote, the election of Donald Trump and elections in Austria, (eastern) Germany, Hungary and Poland make challenges to the EU's legitimacy a very pressing matter that is reflected in increased attention towards these developments. However, challenges to EU legitimacy are not a new phenomenon[242]. Economic crisis, disputes over the intake of refugees as well as Britain leaving the EU resemble the disunity in the 1980s, when Europe got hit by two consecutive oil shocks and wrangled over Britain's budgetary rebate and Spain's and Portugal's accession. Unsurprisingly, public support for further integration dropped significantly between the late 1970s and the early 1980s. To counter these developments, The People's Europe campaign aimed at making "Europe present in their everyday lives through tangible benefits, symbols and culture, and through re-constituting them as Union citizens" (Sternberg, 2013), which constituted a shift from mostly output-oriented to more input-oriented legitimacy policy elements[243].

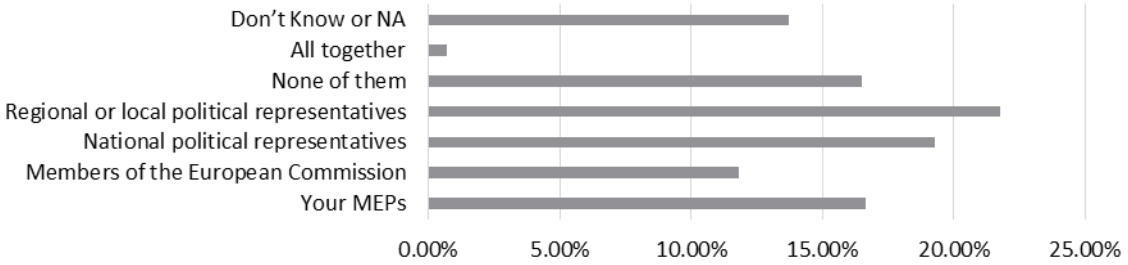
Today, policies aimed at improving perceptions of the EU's input legitimacy are still relevant, as evident from our analysis in chapter 6.3.1.. Recent analysis also shows that simply decreasing the restrictive role of borders through cross-border cooperation programmes might not be enough to increase perceptions of a common context of living, and thus input legitimacy[244]. A stronger focus on the complementarity of social as well as territorial cohesion might be necessary for increasing the EU's input legitimacy[244]. Furthermore, perceptions of the EU's input legitimacy are of particular importance, since perceptions of the EU's throughput and output legitimacy are conditional on the level of identification with or affection towards the EU[245].

Regarding perceptions of throughput legitimacy, localized policies aimed at increasing the transparency of information and the inclusiveness of processes are needed to address very low levels of perceptions of the EU's throughput legitimacy in some regions. Utilizing lower level political actors to convey information (see

[239] https://europa.eu/rapid/press-release_IP-19-4969_en.htm
[240] wiiw, 2019
[241] ESPON 2017; wiiw, 2019
[242] Rodríguez-Pose, 2018
[243] Sternberg, 2013
[244] Decoville & Durand 2019
[245] Harteveld et al. 2013; Sternberg, 2013

Figure 83) as well as closer cooperation with civil society organisation might be fruitful approaches to increase perceptions of transparency of information and inclusiveness through openness to consultation. While high throughput legitimacy does not make up for bad input or output legitimacy, low perceptions of throughput legitimacy might put input as well as output legitimacy into question[246].

Figure 83: Respondents in Interreg CENTRAL EUROPE countries answers to the following question: "From the following political representatives, which ones are best placed to explain you how European policies impact your day-to-day life?"



Data source: Flash Eurobarometer 427 (European Commission, 2016)

As described above, perceptions of output legitimacy are derived from the objective as well as subjective problem-solving capacity of EU policies[247]. To improve perceptions of the EU's output legitimacy, policy makers might focus on making policy efforts more visible to European citizens[248]. To utilize the feedback effects from perceptions of output legitimacy to input legitimacy, success regarding the fulfilment of individual and subjective needs might be just as important as the EU's capacity to fulfil their main goal of achieving 'real' and 'objective' needs of regions[249]. Awareness (e.g. through cultural efforts) and satisfaction (through tangible benefits) arise as two important intermediary concepts linking the perceptions of the EU's legitimacy to the implementation of policies. Additionally, they constitute necessary preconditions for building a European identity, which once again highlights the interdependencies, i.e. feedback effects, between output and input legitimacy.

Another interesting finding regarding this challenge is that there is a comparatively low urban-rural gradient in perceptions of the EU's legitimacy[250]. This reveals the need for targeted policies that go beyond an urban-rural dichotomy. Lastly, policies aimed at improving perceptions of the EU's legitimacy should consider that the link between policies and perceptions does not necessarily follow a rational or utilitarian logic[251]. This is of particular importance regarding throughput and output legitimacy.

Even though the challenge of perceptions of low EU legitimacy has not been explicitly targeted in previous Interreg CENTRAL EUROPE programmes, there are a number of past projects that can serve as a starting

[246] Schmidt 2015
[247] Capello & Perucca, 2018
[248] Capello & Perucca, 2017; Council of the European Union, 2017; https://ec.europa.eu/regional_policy/en/2021_2027/
[249] Capello & Perucca, 2017
[250] This becomes evident when analysing input, throughput and output legitimacy by size of community. For example, the proportion of people that tend to trust the EU is 35% in rural areas, 34% in small or medium sized towns and 38% in larger towns.
[251] Boomgaarden, 2011; Harteveld et al. 2013

point for future policies targeting this challenge. During the 2007-2013 programming period a number of cultural heritage projects have been conducted that aimed, amongst others, at strengthening a European and/or regional identity[252]. For example, the CrossCulTour Project, aimed at the preservation and promotion of cultural sites through an appropriate cross-marketing approach to cultural tourism, “contribute[s] to a stronger regional and European identity and fight[s] against the outward migration from rural areas” (ERICarts, 2014). More recently, the LABEL project has developed a transnational risk management strategy by bringing together public and private stakeholders from four countries along the Elbe River[253]. Projects like these hold the potential to strengthen perceptions of the EU’s legitimacy by increasing mutual trust between participants[254], trust in EU institutions and the visibility of EU policies[255]. But once again it should be considered that the link between policies and perceptions does not necessarily follow a rational or utilitarian logic[256].

Because the Interreg CENTRAL EUROPE Programme is the only programme supporting cooperation between the four Visegrád countries and their neighbours, it holds a unique responsibility but also potential to foster perceptions of a common European identity and a common context of living. The increasing involvement of local actors has the potential to improve input legitimacy by aligning policies more closely with local needs as well as output legitimacy by improving awareness and satisfaction regarding implemented policies. Moreover, perceptions of throughput legitimacy might be improved by increasing transparency about decision processes. As discussed above, spatially relevant projects are likely best suited to increase the visibility of institutional efforts and EU policies. Thus, projects aimed at improving perceptions of the EU’s output legitimacy should be following the logic of integrated development approaches described above.

[252] ERICarts, 2014
[253] https://www.interreg-central.eu/Content.Node/discover/trust.html
[254] Misztal, 2001; Putnam, 1993; Sonmez & Apostolopoul, 2000, Tornberg 2011
[255] Capello & Perucca, 2017
[256] Boomgaarden, 2011; Harteveld et al. 2013; Misztal, 2001

7. A BETTER COOPERATION GOVERNANCE (SO1)

7.1. INTRODUCTION

The chapter dedicated to the Interreg Specific Objective “A better cooperation governance” focusses on the three specific topics:

a) The institutional and stakeholder capacity to participate in and benefit from territorial programmes and strategies;
b) The state of the civil society and its contribution to democracy;
c) The coordination and cooperation with other territorial programmes and the EU macro-regional strategies.

The choice of these three topics was motivated by the currently known[257] draft regulation for Interreg programmes. Under article 14(4) it says that:

“Under Interreg programmes, the ERDF and, where applicable, the external financing instruments of the Union may also support the Interreg-specific objective 'a better cooperation governance', in particular by the following actions:

a) under Interreg strand A programmes[258]: […]
b) under Interreg programmes: enhance institutional capacity of public authorities and stakeholders to implement macro-regional strategies and sea-basin strategies, as well as other territorial strategies;
c) under external cross-border and Interreg strands B, C and D programmes supported by the Interreg funds, in addition to points (a) and (b): building up mutual trust by enhancing sustainable democracy and by supporting civil society actors and their role in reforming processes and democratic transitions;”

From it, it was deduced that demanding that public authorities and stakeholders implement territorial strategies via transnational cooperation requires, as a necessary condition, that they have sufficient capacities and capabilities to do so. Also, there is increasing awareness that civil society needs to play a bigger role in regional and local governance, especially in the context of place-based approaches to the development of integrated strategies. Finally, aligning transnational cooperation with other strategies and programmes involves significant coordination and cooperation efforts to make the programmes and hence Cohesion policy more effective.

Secondly, the three topics for the analysis were motivated by a) a casual analysis of Interreg CENTRAL EUROPE projects and b) interviews with representatives of the National Committees responsible for the programme. The casual analysis raised the suspicion that the distribution of institutional and stakeholder capacity might be unevenly distributed across the regions in central Europe.

[257] As of September 2019
[258] Paragraph a refers to Cross-Border Cooperation programmes and is thus not relevant for the Interreg CENTRAL EUROPE programme.

Thirdly, amongst other issues, the ex-post evaluations of the 2007-2013 Interreg programmes[259] concluded that: "*There was furthermore little coordination between Interreg and other ESIF programmes, nor was there much sharing of project results between regional stakeholders and central/regional authorities, the latter showing little interest in being involved. The potential leverage effect of Interreg programmes that such coordination could have favoured was therefore not fully realised*." [260] This statement motivated looking a bit more into the details of the challenges and opportunities for the Interreg CENTRAL EUROPE Programme to cooperate with other European and national programmes.

7.2. INSTITUTIONAL AND STAKEHOLDER CAPACITY TO PARTICIPATE IN AND BENEFIT FROM TERRITORIAL PROGRAMMES AND STRATEGIES

The starting points of the analysis are the following considerations:

a) Part of the transnational cooperation's success depends on the number of stakeholders participating in it. The higher their number is the higher is the outreach of the transnational cooperation programme and the larger is the use made from cooperation project results.
b) Transnational cooperation creates capacities in all the different areas covered by the programmes' priority areas. Hence, again, the higher the cooperation participation is the more stakeholders will have the opportunity to strengthen their capacities. Importantly however, to participate in transnational cooperation and to benefit from it, also requires ample stakeholders' capacities.
c) A lack of such participation capacities might lead to the unwanted effects that:
    a. project opportunities addressing important issues might be missed due to a lack of capacity to develop and implement project ideas.
    b. potentially good projects might not get funded due to a lack of the specific skills needed (including language skills) when dealing with European projects, while less suited projects might get funded due to the applicants experience and knowledge with EU programmes.

Additionally, independent of the capacity to participate, another aim of transnational cooperation in central Europe is to maximise the programme's impact by a) maximising the number of stakeholders benefitting from the projects' outputs and/or b) upscaling the projects' outputs. This too requires a specific set of stakeholder capacities. Notably, the Interreg CENTRAL EUROPE Programme is well aware of this and started to address these issues in its 4th, experimental, call for project proposals "Capitalisation through Coordination" in 2019.

In the following part we will briefly analyse the stakeholders' capacities to participate and benefit from transnational cooperation. In more detail, we will investigate whether due to capacity differences, the Interreg CENTRAL EUROPE Programme might become exclusive by favouring only a group of regions instead of being inclusive and involving all type of regions. This is particularly relevant in the context of regional, territorial development being a multidimensional issue, which not only spans over a variety of horizontal topics (like innovation, skills, transport, environment etc.) but also vertically of different types of regions that together form a local functional area, e.g. in the urban, sub-urban and rural context.

[259] DG Regio (2016a), European Territorial Cooperation Work Package 11 - Ex-post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF).
[260] DG Regio (2016b), WP1: Synthesis report: Task 3 Interreg Programmes - Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF).

7.2.1. The challenge

In the following we will present empirical evidence on the participation of central European regions in the 2014-2020 Interreg CENTRAL EUROPE Programme. Participation is understood as active participation in transnational cooperation projects as lead partner or project partner. It will be measured at the NUTS-2 level of regions and a) by the number of participants from the respective region in the projects supported by the Interreg CENTRAL EUROPE Programme and b) the eligible expenditure of these projects by regions.

The underlying assumption of the analysis is that, provided the institutional and stakeholder capacity to participate in territorial programmes and strategies is equal across regions, Interreg CENTRAL EUROPE projects should also be fairly equally distributed across regions. Consequently, if we detect an uneven distribution of projects this may hint towards an unequal distribution of capacities.

For the analysis we generated two specific indices measuring the participation intensity of the central European regions. The first index is the participation index. It was calculated as the ratio of a NUTS-2 regions' share in total project participations and the respective region's population share. Notably, this index was calculated at the country level. Hence the share in total project participation refers to the region's share in the total participations of its country. The population share is defined accordingly. By calculating the index by countries, we avoid differences in the countries' institutional settings that may cause some countries participating less intensively than others in the Interreg CENTRAL EUROPE Programme.

If, for one region this index has a value of 100, it indicates that the regions participation share and population share are identical. If all regions had a value of 100 this would hint towards an equal distribution of capacities. If the value is above 100 this indicates that the region's participation share is higher than its population share. Hence, this region participates over-proportionally in Interreg CENTRAL EUROPE projects. Also, the higher the index is, the higher is this regions participation intensity, e.g. if the index is 200 it means that a region's participation share is twice as high as its population share.

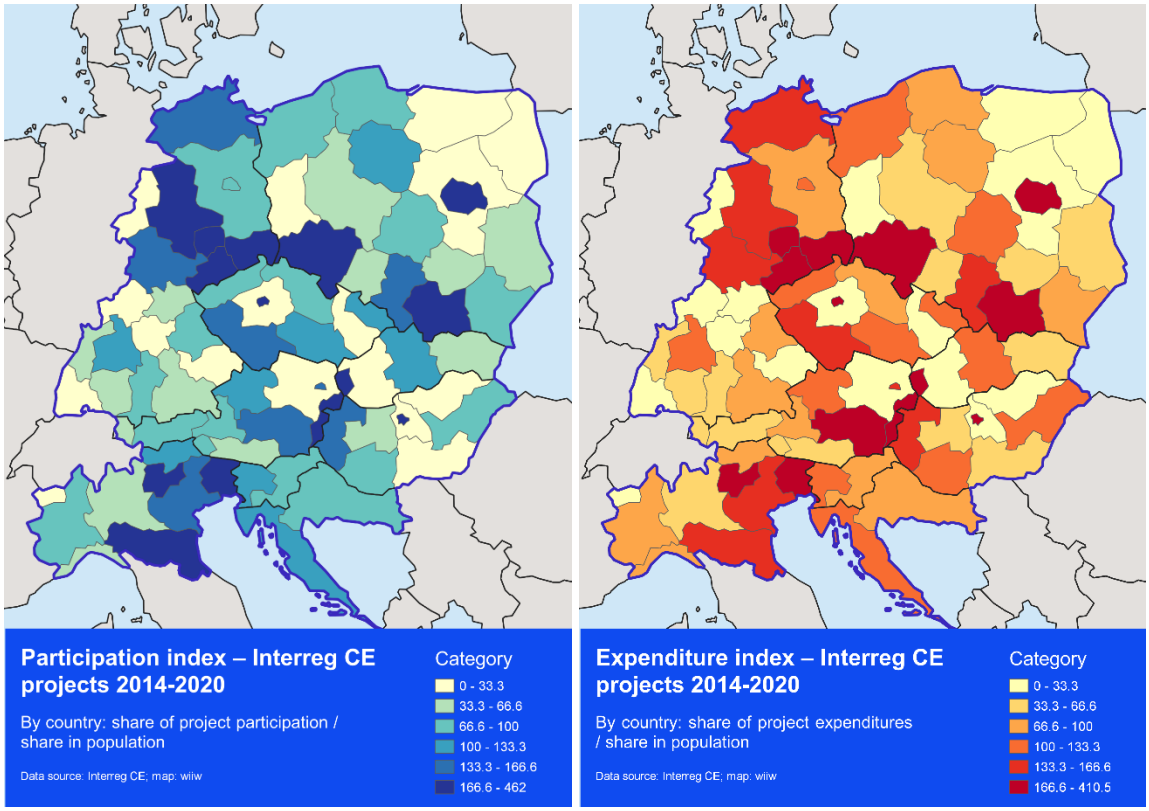
The second index is the expenditure index. It is defined identically to the participation index, except that the participation share is substituted by the regions' share in total eligible project expenditures.

The results are presented in two maps in Figure 84, showing the NUTS-2 participation index on the left and the NUTS-2 expenditure index on the right). The maps reveal a quite heterogeneous distribution of project participation across central Europe regions. Thus, for most central Europe countries only a small number of regions have a high participation and expenditure index, indicated by the blue and green colours in the maps. These regions are mostly capital cities and other main urban centres or their conurbations. Contrastingly, there is a considerable number of regions with little to even no project participations at all (indicated in orange and red). This is particular apparent in Germany and Poland, but also for the Czech Republic, Hungary and Slovakia, where project participation is highly concentrated in (and around) the capital cities. Nevertheless, to a lesser extent all central European countries, except Slovenia and Croatia, have regions with a low Interreg CENTRAL EUROPE project participation.

Notably, botch indices are only tentative indicators for the regions' capacities to participate and benefit from transnational cooperation. This is because the available data includes the location of the transnational project partners. This however might not be identical to the actual location where the projects take place or their effects are seen, e.g. in the case of strategies being developed in the capital cities that actually affect rural

regions in other parts of the country. Hence, the results and conclusions thereof need to be qualified to some extent.

Figure 84: Maps: participation[1] (left) and expenditure[2] (right) index - Interreg CENTRAL EUROPE 2014-2020 projects, NUTS-2 regions.



Note: 1) The index is calculated as the ratio of the share of project participations and the share of population of the respective type of regions
2) The index is calculated as the ratio of the share of the projects sum of eligible expenditures and the share of population of the respective type of regions.
Source: Interreg CENTRAL EUROPE

7.2.2. Policy needs and potentials

The paper suggests that the regions' capacities to participate in the Interreg CENTRAL EUROPE Programme are unevenly distributed.

Keeping in mind the nature of the data, the first policy need is to falsify or verify above findings with more accurate information on the stakeholders' capacity to participate in transnational cooperation. This could be done via surveys and interviews, e.g. during the evaluation process of the Interreg CENTRAL EUROPE Programme. Ideally, such an analysis includes the reasons for this heterogeneity in project participation.

If there is indeed a lack of capacity found, the policy need is to increase the stakeholders' capacity to participate and benefit from transnational cooperation.

Dedicating part of the Specific Objective "A better cooperation governance" to this need would have at least two advantages. Firstly, it allows transnational cooperation to use its full toolkit for increasing the regions' and stakeholders' capacities to participate in the Interreg CENTRAL EUROPE programme but also in other EU-funded programmes or the macro-regional strategies. Thus, in this Specific Objective projects dedicated projects can be set up to increase the stakeholders' capacities via:

- Training activities to teach fundamental skills in project related work (e.g. application, management and communication) in order to lower the entry barriers to project applications
- Information activities – from leaflets, to workshops and conferences, to inform about funding options
- The creation of networks that a) bring together parties interested in participating in transnational cooperation and b) allow pooling their resources.
- The creation of platforms or other tools to facilitate project organisation, project management, the finding of project partners etc.
- The exchange of knowledge to allow learning from similar experiences, e.g. how to successfully participate in transnational cooperation in the case of smaller towns, villages or territories.
- Pilot actions, e.g. mentoring schemes where experienced stakeholders co-operate with less experienced stakeholders in the various stage of a project's lifecycle.

Secondly, dedicated projects may solve the "hen and egg" problem inherent to the capacity to participate in transnational programmes, which may arise if the participation in capacity building projects requires itself the capacity to participate in this specific project. Hence, in the Specific Objective stakeholders with lacking capacities can be actively addressed by projects led by institutions with sufficient capacities (e.g. like regional development agencies), mitigating the "hen and egg" problem.

In this respect, the possibility to participate as associated partner in Interreg CENTRAL EUROPE projects needs to be highlighted. It seems to be especially useful for stakeholders with less resources to participate in transnational cooperation projects and thus is a good tool to make the programme more inclusive. Quite likely, the associated partner provision will become more important the higher the focus will be on territorially integrated projects, e.g. where the effects of the projects' activities affect neighbouring regions (e.g. in an urban-rural context), or where stakeholders from different institutions at the local, regional or national ideally should cooperate for holistic approaches to tackle the regions' problems.

In addition to increasing the participation capacity another policy need is to maximise the benefits of transnational cooperation programmes. Two ways to do this are:

- Upscaling of projects, i.e. bringing the projects' outputs to a higher level by accessing new and better endowed funding schemes and/or securing political buy-in.
- The roll-out of project results, i.e. making the project outputs available and repeatable for a larger audience.

As mentioned above, the Interreg CENTRAL EUROPE Programme is well aware of this and correspondingly addressed it in its 4th, experimental, call for project proposals "Capitalisation through Coordination" in 2019. The projects from this call will only start in 2020 and first results will be available even later.

Therefore, from our perspective the next steps in the process are:

- Keeping up such up-scaling and roll-out activities
- Evaluating the projects, their output and effects
- Expand and/or improve upscaling/roll-out activities based on findings from the first experimental projects.

7.3. THE STATE OF THE CIVIL SOCIETY AND ITS CONTRIBUTION TO DEMOCRACY

One of the many challenges Europe and in particular part of central Europe face is a rise in nationalism accompanied by a loss of trust in European and national institutions. This shows that democracy is more fragile than one may assume, and its institutions may take a long time to be established fully, yet they could collapse quickly.

One way to increase the political, societal sustainability of democracy is by strengthening its participatory dimension by empowering citizens and enabling the civil society to participate in decision making processes and governance. The importance of this has been reiterated by the "Civil Society Days 2019" conference organised by the European Economic and Social Committee[261].

Here civil society is understood to be the private sector of the society, different from the government and business sector. It includes independent non-governmental organisations that express and manifest the will of individuals.

7.3.1. The challenge

This section provides a short empirical overview of the perception of democracy as well as the potentials for the civil society in central Europe. The perception of democracy is illustrated by the "Democracy Index" compiled by the Economist Intelligence Unit.

This index intends to measure the state of democracy at a global level, covering 167 countries. It consists of five sub-indices measuring a) the quality of the electoral process and pluralism, b) the functioning of government, c) the extent of political participation, d) the political culture and e) the amount of civil liberties. In addition, the "Democracy Index" summarises these 5 sub-indices and gives an overall assessment of the state of democracy[262].

Starting with the democracy index (see Figure 85), its value ranges from 0 (i.e. complete authoritarian regime) to 10 (complete democracy). Index values above 8 are considered to indicate so called "Full democracies". According to the creators of the index[263] full democracies are: "*Countries in which not only basic political freedoms and civil liberties are respected, but which also tend to be underpinned by a political culture conducive to the flourishing of democracy. The functioning of government is satisfactory. Media are*

[261] https://www.eesc.europa.eu/en/agenda/our-events/events/civil-society-days-2019
[262] http://www.eiu.com/public/thankyou_download.aspx?activity=download&campaignid=Democracy2018

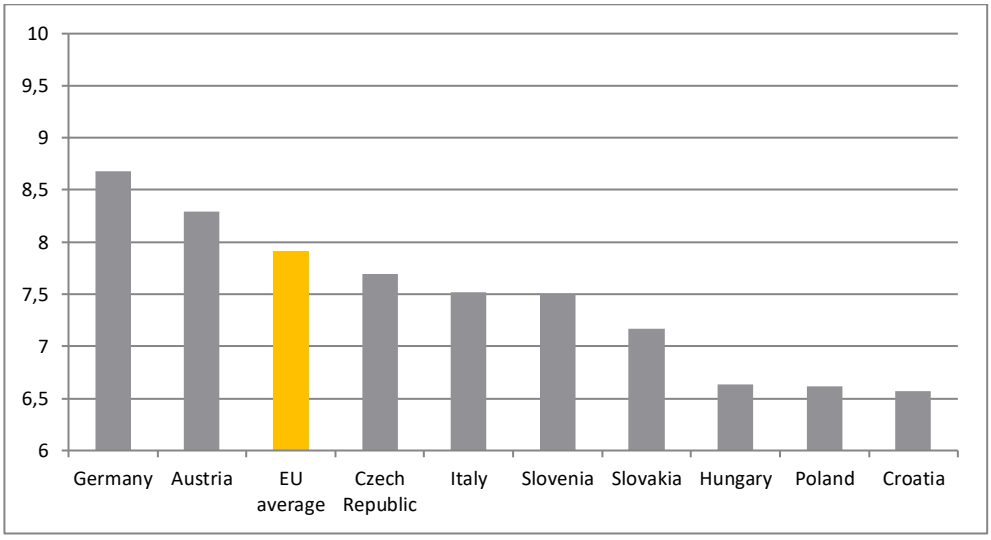
[263] Economist Intelligence Unit (2018), Democracy Index 2018: Me too? - Political participation, protest and democracy

independent and diverse. There is an effective system of checks and balances. The judiciary is independent and judicial decisions are enforced. There are only limited problems in the functioning of democracies."[264]

Index values higher than 6 but equal or lower than 8 indicate so called "Flawed democracies": "*These countries also have free and fair elections and, even if there are problems (such as infringements on media freedom), basic civil liberties are respected. However, there are significant weaknesses in other aspects of democracy, including problems in governance, an underdeveloped political culture and low levels of political participation.*"[265]

In central Europe only two countries, Germany and Austria have index values above 8, while all other countries' index values, including the EU average, range between 6 and 8. Notably, in global comparison, central Europe is doing very well in terms of democracy. Still, the index suggests that there is room for improvement in the democratic systems.

Figure 85: Democracy Index 2019



Source: Economist Intelligence Unit

To assess the status of the civil society in central Europe we use two sub-indices of the "Democracy Index", namely a) the Political participation index and b) the Civil liberties index. The Political participation index covers aspects like whether religious and other minorities have a reasonable degree of autonomy and voice in the political process, or the degree of Citizens' engagement with politics the citizens' engagement with politics.

Likewise, the Civil liberties index addresses inter alia issues of free electronic and print media as well as the freedom of expression and protest, all of which are fundamental institutions for the power of the civil society and the functioning of democracy. Again, the range of both indices is from 0 (worst) to 10 (best).

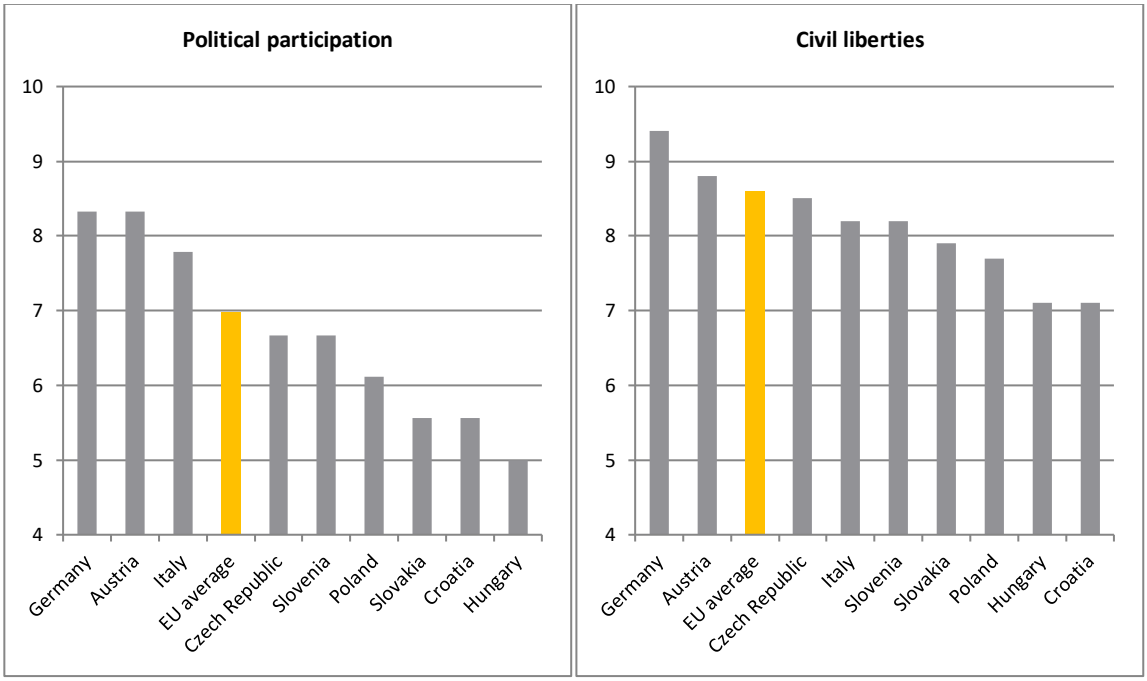
As illustrated by Figure 86, there is a large heterogeneity in political participation (left graph) across central Europe countries. While it is considered to by high in Germany, Austria and Italy, it is considerably lower in the

[264] Economist Intelligence Unit (2018), p. 49
[265] Economist Intelligence Unit (2018), p. 49

Eastern countries of central Europe, particularly in Slovakia, Croatia and Hungary. In the latter, the index value is 5. This is not only much below the EU average, but also on a global scale a comparatively low level and equal to the score of Russia, Turkey and Colombia.

As far as civil liberties are concerned, there is almost an equally strong differentiation across central Europe countries, with Germany and Austria having index values above the EU average of 8.7, while the other countries are below this average. To be fair, though, most of the civil liberties index values in central Europe are comparatively high, i.e. above 7.5, only Hungary and Croatia trail behind.

Figure 86: Political participation (left graph) and Civil liberties (right graph) indices, 2019



Source: Economist Intelligence Unit

7.3.2. Policy needs and potentials

There is no doubt that democracies are working in central Europe. Nevertheless, the data suggests that there is also room for significant improvement in a number of countries. One way to go about it is to strengthen the role of civil society and include it especially in the regional and local institutions and decision-making processes. Such inclusion becomes even more important in the light of developing place-based integrated strategies for local and regional development. Here, civil society and its non-governmental organisations can make important bottom-up contributions to such strategies, thereby creating mutual accountability between the government and the citizens as well as a common identity.

Inter alia, the potentials for transnational cooperation to support these processes are:

- Strengthening administrative and institutional capacities of local and regional government via improving the delivery of public services and the outreach to citizens;

- Strengthening administrative and institutional capacities by fostering citizen-oriented governance and participatory decision making;
- Strengthening the role and capacities of civil society in the democratic processes and enhance their cooperation with public authorities.
- Inclusion of marginalised groups and communities, inter alia via developing e-government tools to allow citizens contributing to local and regional strategies and providing suggestions for improving policies.
- Supporting the development of digital ICT solutions to make participation in decision making processes easier for young people.
- Generally, the support of young people and marginalised groups and communities to enable them to effectively express their issues they care about (e.g. environment, culture, sports etc.) can have positive repercussion on the development of especially rural areas.
- Creating opportunities for elderly citizens to actively engage in local communities, e.g. by supporting voluntary work.
- Exchange information on best practices on civil-society inclusion in decision making processes as well as on user-centred and community-led service provision

7.4. COORDINATION AND COOPERATION WITH OTHER TERRITORIAL PROGRAMMES AND THE EU MACRO-REGIONAL STRATEGIES

The importance of coordination and cooperation with other territorial programmes and the four EU macro-regional strategies is well recognised within transnational cooperation programmes in general and the Interreg CENTRAL EUROPE programme specifically. Amongst other things, this is evidenced by a dedicated publication that thoroughly discusses the benefits and difficulties of this topic[266]. It defines cooperation and coordination in the following way:

1. *Coordination – an attempt at reaching an agreement on sharing tasks and responsibilities in working together; focusing on identifying ex-ante complementarities and possible synergies;*
2. *Cooperation – reaching an agreement on working together where everyone needs to give up something, both to gain individually and for the common benefit; using complementarities in practice, and developing them even further.*

The importance of these two interlinked concepts is based on the notion that, the success of transnational cooperation programmes depends, amongst other things, on the extent to which Interreg project results can be transferred to and up-scaled by other, financially more powerful, European or national programmes. Achieving this, consistently requires a significant amount of coordination and cooperation of the various programmes. As transnational cooperation projects are important tools to implement local, regional and transnational cooperation initiatives, coordinating and cooperating with mainstream and/or national programmes creates opportunities to capitalise the projects' outputs, and consequently to multiply its territorial impact.

In turn, the effectiveness of transnational cooperation programmes depends, amongst other things, on the extent of synergies and complementarities that can be developed between different regional and territorial programmes, e.g. transnational cooperation, cross-border cooperation, mainstream as well as

[266] Interact, (2017) Coordination and cooperation: how?. www.interact-eu.net/ajax-load-pub/nojs/1653

national/regional/local programmes). Thus, by avoiding overlaps and building on the specific strengths of each specific programme, their impact and effects on territorial cohesion as well as their individual visibility will be increased.

In this respect it needs to be noted that Interreg CENTRAL EUROPE Programme has an important bridging function for the EU macro-regional strategies as it is the only programme that jointly touches all of them. It thus is a quasi-natural hub, with the potential and possibilities to facilitate the cooperation across the four macro-regional strategies, which, according to the EU Commission is of key importance and "*may result in added value*"[267] through maximising mutual co-benefits and impact. "*Thereby cross-strategy cooperation can take different forms (e.g. implementation of joint projects, sharing of best practices and experience, etc.)*."[268]

The characteristics of coordination and cooperation tend to vary, depending on the type of the partner programme. In total, 5 coordination and cooperation types can be identified[269], namely coordination and cooperation

- other Interreg programmes on programme procedures
- within an Interreg programme and with other Interreg programmes on programme thematic objectives (priorities) and projects
- between Interreg, national and regional (ESIF) programmes
- between Interreg and other EU-wide programmes, initiatives and funds, including the European Grouping of Territorial Cooperation (EGTC).
- between Interreg and the four EU macro-regional strategies.

All coordination and cooperation types offer a large number of potential benefits that would make transnational cooperation programmes and their projects much more effective. Inter alia these benefits include[270]:

- A simplification and harmonisation of procedures, e.g. by applying the same rules and templates, facilitating the application process and enhancing data collection for monitoring and evaluation[271].
- The creation of mutual learning possibilities.
- The building of synergies between thematically related projects.
- A reduction of thematic and territorial overlaps and/or the duplication of projects in different programmes.
- A greater policy impact and value for money.
- The mainstreaming of Interreg project results to the ESIF mainstream programmes, thereby up-scaling initial Interreg funds.
- A greater policy impact and higher sustainability of Interreg project results.

Simultaneously, it is also acknowledged that to put coordination and cooperation into practice faces a large number of challenges.

[267] EU Commission (2019)
[268] DG Regio (2019).
[269] Interact, (2017) p.10.
[270] For a full list of benefits see: Interact (2017) p.13ff
[271] This already is done via the Harmonised implementation tools (HIT) process facilitated by Interact.

7.4.1. The challenge

The extent of the challenge to a proper coordination and cooperation between different programmes and strategies is significant. Among the main difficulties are[272]

- Insufficient structured exchange between programmes.
- Limited availability of tools to facilitate coordination and cooperation.
- Lack of knowledge regarding the added value of coordination and cooperation.
- Communication issues such as language barriers, especially in the case of national programmes that are implemented and documented in national languages.

Notably. these challenges are not a specific to the CENTRAL EUROPE Programme. More generally, the issue of “overlaps” affects nearly all transnational programmes, like the Interreg North-West Europe, the Danube Transnational Programme or the Interreg Mediterranean Programme have similar problems. According to a recent paper from the heads of the MAs and JSs of transnational programmes[273] overlaps of their programmes with other Interreg programmes are defined via programmes a) support the same policy (addressing Cohesion through Territorial Cooperation), b) address the same themes, c) address the same geographic areas (or parts thereof). Such overlaps create additional challenges like:

- Uneven access to funding, i.e. applicants from overlapping regions have access to more funds than applicant from regions or sectors covered by only one programme;
- Competition between programmes, i.e. differences in subsidy rates, administrative burden etc. may create a bias in programme selection as applicants prefer one programme over another.
- Creation of “application specialists” shopping around various programmes with one project idea, focussing on money rather than on contributing to cohesion. This includes double-funding of the same project (even if there are - slight - changes to project partners or other aspects to conform to legal requirements.)
- Duplication of results, i.e. two different projects delivering virtually the same output.

From our perspective the main challenge behind the points above are the limited human and financial resources to deal with the high number of national, regional and EU wide programmes that overlap with the Interreg CENTRAL EUROPE territory or agenda. If counted correctly, coordinating the Interreg CENTRAL EUROPE Programme with other programmes in the area includes a) five partially overlapping Interreg programmes (Baltic sea region, Alpine space, Adrion, Mediterranean and the Danube Transnational), b) ca. 21 Cross-border cooperation programmes connecting central Europe countries, c) 34 European Groupings of Territorial Cooperation programmes, d) all four EU macro-regional strategies, e) a large number of EUREGIOs, as well as f) EU wide programmes like Horizon 2020. Notably, national and regional programmes and strategies are not included in this list.

As far as the EUREGIOs are concerned it is difficult to give an exact assessment of how many EUREGIOs exist in the EU and how many are active in Central Europe. A recent study estimates the total number of

[272] See Interact (2017) p.13ff.
[273] Interreg (2019), Overlaps in Interreg, mimeo

active EUREGIOs in the EU to be 158[274]. Of these around 50 should be active in Central Europe, particularly in the border regions of Germany, Poland, Czech Republic, Slovakia, Hungary and Austria.

The complexity of the challenge is further illustrated by Table 5 and Table 6., The first table, based on the available data from keep.eu, lists those cross-border and transnational cooperation programmes that partly overlap with the Interreg CENTRAL EUROPE Programme and shows the number of projects by thematic objectives. The second table, based on the information from the Committee of the Regions[275], lists those European Groupings of Territorial Cooperation programmes, where at least one Central Europe region participates. Notably, this table indicates that a) most EGTCs in Central Europe are bilateral institutions and b) they are most popular in Hungary, as it is the country with the, by far, most EGTC covering parts of its area.

7.4.2. Policy needs and potentials

The need to coordinate within the Interreg CENTRAL EUROPE Programme as well as across the various European and national programmes is big. The rewards of such co-operations in terms of efficiency gains, up-scaling potentials, roll-out of developed solutions as well as outreach would be equally big. Yet, the obstacles for and the complexity of cooperation are at least equally big.

The Interact analysis has presented a number of policy options for cross-programme cooperation, inter alia like[276]:

- Internal staff rotation between programmes;
- Regular contacts and exchanges among programme authorities;
- Inter-programme competence trainings and meetings on complementary topics;
- Joint events addressing a specific theme for greater visibility;
- Thematic networks for a) programmes addressing similar themes/priorities and b) projects exchanging on state of play, visions, sharing achievements;
- Coordinated calls for and assessment of project proposals;
- Coordinated monitoring and reporting;
- Creation of a position for a Joint (Technical) Secretariat Officer for capitalisation and cooperation with other programmes;
- Establishing or joining project platforms and building co-ownership from the programme side;
- Developing ‘project chains’: piloting a case where the initial stage of a project would be done by Interreg, then further implemented and expanded by other ESIF programme(s);
- Establishing working groups with other programmes; e.g. for defining and clarifying each programme’s role, exchanging on implementation and achievements, linking projects and building ‘project chains’;
- Organisation of a more structured exchange between Interreg and EU programmes to coordinate applications and leverage project results.
- Provide a platform for establishing new EGTCs and supporting activities of existing EGTCs.

[274] Dura et al. (2018)
[275] https://portal.cor.europa.eu/egtc/CoRActivities/Documents/Official_List_of_the_EGTCs.pdf?Web=0
[276] See Interact (2017) p.12ff.

Table 5: Interreg TNC and CBC programmes overlapping with the Interreg CE Programme, number of projects by programme and investment priority

Programme	Strengthening RTD and innovation	Enhancing the competitiveness of SMEs	Supporting the shift towards a low-carbon economy	Promoting climate change adaptation, etc.	Preserving, protecting the environment etc.	Promoting sustainable transport etc.	Promoting sustainable and quality employment etc	Investing in education, training and vocational training etc	Enhancing institutional capacity etc.	TOTAL
V-A Austria - Czech Republic	11				21			6	6	**44**
V-A Bayern - Österreich	14				16				12	**42**
V-A Austria - Hungary		5			15	6			13	**39**
V-A Czech Republic - Poland				8			62	13	69	**152**
V-A Alpenrhein - Bodensee - Hochrhein)	33		1		18		8		16	**76**
V-A Bavaria - Czech Republic	21				36			17	24	**98**
V-A Brandenburg - Poland					9	3		5	15	**32**
V-A Mecklenburg – W. Pomerania - Poland					8	1		5	14	**28**
V-A Saxony - Czech Republic				12	43			38	33	**126**
V-A Italy - Austria	21				27				20	**68**
V-A Italy - Slovenia	8		5		8				8	**29**
V-A South Baltic		12			34	14	10		11	**81**
V-A Poland - Saxony					5	4		9	14	**32**
V-A Poland - Slovakia					36	12		5		**53**
V-A Slovakia - Austria	6				10				7	**23**
V-A Slovakia - Czech Republic					29			14	22	**65**
V-A Slovakia - Hungary					29	4			28	**61**
V-A Slovenia - Austria	17				10				12	**39**
V-A Slovenia - Croatia				4	26				8	**38**
V-A Slovenia - Hungary					12				7	**19**
V B Adriatic - Ionian	14				10	10			1	**35**
V B Alpine Space	17		14		14				4	**49**
V B Baltic Sea	45				37	29			23	**134**
V B Danube	25				27	16			39	**107**
V B Mediterranean	34		26		30				1	**91**
VB Central Europe	**43**		**23**		**45**	**15**				**126**
Sum of all programmes	**309**	**17**	**69**	**24**	**555**	**114**	**80**	**112**	**407**	**1687**

Note: No data for the Interreg V-A - Hungary-Croatia programme. Source: keep.eu database.

Presently, the Interreg CENTRAL EUROPE Programme is well aware of the need for cooperation. Amongst other things is engages in regular exchanges with other transnational programmes, covering programme management related topics such as programme/project implementation, finances and control etc. The programme also participates in thematic working groups and networks facilitated by Interact (and exchange with other transnational programmes to explore potential synergies.

Importantly, for the Interreg CENTRAL EUROPE Programme national committees in the programme Member States have been set up, which inter alia facilitate the coordination with ESIF national and regional programmes. Further cooperation and coordination have been initiated with DG Regional Development, as well as with the DG for Research and Innovation (DG RTD) and the Horizon 2020 Programme (the latter two were triggered by the 4th call for projects) with the aim to provide a focus for the projects' implementation and their potential upscaling through other funding opportunities.

From the outside, the Interreg CENTRAL EUROPE Programme seems to do what is reasonably possible to coordinate and cooperate with other programmes. Still, given the size of the cooperation challenges and possibly also in the view of the evaluators of the Interreg programmes, these efforts might not be enough. If this is the case, it needs to be made clear that any further coordination and cooperation can only reasonably be done if more resources are available for it.

Quite likely, if feasible such ideas need some time to evolve at the European level (see also paper from the heads of the MAs and JSs of transnational programmes). In the meantime, transnational cooperation could make use of its competitive advantage and engage in a number of projects dedicated to the coordination and cooperation of national, regional, local as well as European programmes and strategies. With the help of pilot actions (e.g. the generation of funding chains), the development of tools (e.g. platforms), the exchange of knowledge and the bringing together of stakeholders, small steps can be taken to exemplify the merits, showcase the possibilities of co-operation from a bottom-up perspective and generate opportunities for up-scaling such projects.

Table 6: List of EGTC programmes in Central Europe

EGTC Name	Participating countries
GECT Euregio Tirolo -Alto Adige -Trentino	AT/IT
GECT "Euregio Senza Confini r.l. –Euregio Ohne Grenzen mbH"	AT/IT
Geopark Karawanken m.b.H.	AT/SI
European Grouping of Territorial Cooperation Spoločný región limited	CZ/SK
Eisenbahnneubaustrecke Desden-Prag EVTZ	DE/CZ
Mura Region EGTC	HU/HR
Bánát -Triplex Confinium Limited Liability EGTC	HU/RO
EGTC Gate to Europe Ltd.	HU/RO
European Common Future Building EGTC	HU/RO
European Border Cities EGTC	HU/RO
Pannon EGTC	HU/SI
MASH European Grouping of Territorial Cooperation	HU/SI
MURABA EGTC	HU/SI
Ister-Granum European Grouping of Territorial Co-operation Ltd	HU/SK
Ung-Tisza-Túr-Sajó (Hernád-Bódva-Szinva) Limited Liability EGTC	HU/SK
ABAÚJ -ABAÚJBAN European Grouping of Territorial Co-operation Ltd	HU/SK
Pons Danubii EGTC	HU/SK
Arrabona EGTC Ltd.	HU/SK
Rába-Duna-Vág EGTC Ltd.	HU/SK
BODROGKÖZI EGTC Ltd	HU/SK
Novohrad-Nógrád EGTC	HU/SK
Slaná -Rimava European Grouping of Territorial Cooperation with Limited Liability	HU/SK
European Grouping of Territorial Cooperation Via Carpatia Limited	HU/SK
Torysa European Grouping of Territorial Cooperation (Torysa EGTC)	HU/SK
Svinka EGTC	HU/SK
PONTIBUS EGTC Limited Liability	HU/SK
Ipoly-völgye EGTC	HU/SK
Tisza EGTC	HU/UA
Territorio dei comuni: Comune di Gorizia (I), Mestna Občina Nova Gorica (Slo) e Občina Šempeter-Vrtojba (Slo)	IT/SI
European Grouping of Territorial Cooperation European Urban Knowledge Network Limited	NL/BE/ CY/CZ/ FR/DE/ LU/ RO
EGTC NOVUM Ltd.	PL/CZ
European Grouping of Territorial Cooperation TRITIA limited	PL/CZ/SK
Central European Transport Corridor Limited Liability European Grouping of TerritorialCo-operation	PL/HU/SE/HR
EGTC TATRY Ltd.	PL/SK

Source: Committee of the Regions

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