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Socio-economic challenges, potentials and impacts of transnational cooperation in central Europe

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Socio-economic challenges, potentials and impacts of transnational cooperation in central Europe

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1. Introduction

This study presents the results of an analysis of the territorial challenges, potential and impacts of transnational cooperation (TNC) in Central Europe (CE). The study is divided into three tasks:

1. Identification of the main territorial challenges and needs that are affecting CE,

2. Analysis of impacts and results of transnational cooperation in CE achieved by the CE 2007-2013 Programme and illustrated by concrete case studies,

3. Outlook and conclusions on the needs and potential of transnational cooperation in CE.

Task 1 analyses the main challenges that affect the CE territory, as well as the specific needs that have to be addressed in the framework of TNC, in order to tackle these challenges and improve working and living conditions in CE. To identify the challenges and needs of the CE territory, the study adopts a three-step approach. First, it identifies the relevant challenges, based on a survey of recent studies, reports, policy papers and academic literature. Secondly, Task 1 analyses those policy areas of the challenges in more detail for which TNC has high potential to promote regional integration and development. Finally, the analysis looks at the specific needs of the CE territory that have to be addressed by TNC in order to deal effectively with the identified challenge dimensions.

Task 2 analyses the achievements and results of the CE 2007-2013 Programme, as well as the focus of the Interreg CE 2014-2020 Programme. The task is split into two parts, whereby the **first part** includes a quantitative analysis of the financial, output and outreach and results data, as well as a qualitative analysis of the CE 2007-2013 Programme's results. The analysis of the Interreg CE 2014-2020 Programme covers the available financial data, the allocation of selected projects across priorities and a short overview of the main topics covered by these projects. The **second part** consists of a survey conducted among 2007-2013 project partners and 12 case studies providing an in-depth analysis of selected projects from the 2007-2013 period.

Task 3 summarises the results of Task 1 and Task 2 and assesses the key contributions of the CE Programme to tackle the CE territory's challenges. The task also comments on the CE Programme's synergies with other EU policies, like macro-regional strategies or the Europe 2020 strategy. Also, Task 3 provides recommendations regarding the fourth call for proposals of the current CE Programme. Finally, it will take a look at the potential focus of a post-2020 CE Programme, based on its importance within EU cohesion policy in general, and transnational cooperation programmes in particular.

2. Identification of the main territorial challenges

2.1. INTRODUCTION

Task 1 focuses on the main challenges that affect Central Europe (CE) as well as the specific needs that have to be addressed within the framework of transnational cooperation (TNC), in order a) to tackle these challenges, and as a result b) to improve working and living conditions in CE.

The challenges to be analysed in this task were identified on the basis of a survey of recent studies, reports, policy papers and academic literature. This included inter alia three studies by DG Regio that focus on five main future challenges for EU regions: globalisation, demographic change, climate change, energy and social polarisation (the 2011 study also covers the economic and financial crisis).[1] Likewise, a recent DG Regio study investigates the economic challenges of lagging regions in the EU and their investment needs in terms of competitiveness, accessibility, governance, skills and employment, as well as research, development and technology in low-growth and low-income regions of the EU.[2]

The Seventh Cohesion Report provides a comprehensive overview of economic, social and territorial cohesion in the EU.[3] The report highlights, both explicitly and implicitly, a large number of potential challenges, especially with regard to the regions of CE. Inter alia these challenges include a) economic challenges, b) employment (especially the rates of people not in education, employment or training (NEET) in the CE territory), c) population/migration, d) health, e) transport infrastructure, f) governance, g) energy and h) climate change. The same holds for the background study to the Interreg CE cooperation programme,[4] which analyses similar challenges as the Cohesion Report. Other studies reviewed include the 'Socio-Economic Assessment of the Danube Region,[5] which analyses a geographical area that partly overlaps with the CE territory.

As a result of this survey, the main challenges for the CE territory were identified as:

- Circular economy/environment
- Climate change
- Demographic change/migration
- Digital economy
- Employment/skills
- Energy
- Globalisation/competitiveness
- Governance

[1] DG Regio, 2008; 2009; 2011.
[2] DG Regio, 2017a.
[3] DG Regio, 2017b.
[4] ÖIR and PAN IGiPZ, 2012.
[5] IAW, wiiw and ZEW, 2015a; 2015b.

- Social situation/social risks
- Transport infrastructure/accessibility.

Many of the challenges are of an abstract nature and contain a multitude of dimensions, making it difficult to pin them down in a coherent and precise way. For example, 'globalisation' is considered to be a major challenge, yet it is difficult to describe this phenomenon in a simple way. Accordingly, policy responses to the general challenge of 'globalisation' may be difficult to find, especially in the context of TNC.

Therefore, it is useful to dissect 'globalisation/competitiveness' into various policy areas and analyse those in more detail. As an illustration, 'globalisation/competitiveness' can be a challenge for the regions because it a) affects global trade or flows of goods and services, b) has implications for the transport infrastructure, c) affects regions differently due to differences in sectoral structure, d) pressures the regions to constantly increase productivity, e) requires a strengthening of the innovative potential, f) requires skill upgrading of the workforce, and g) demands a good information and communication technology (ICT) infrastructure, etc.

This necessitates filtering out those policy areas of the challenge that a) show a high potential for TNC to promote regional integration and development and b) are specific to the respective challenge, to avoid overlaps with the analysis of other challenges (e.g. ICT infrastructure is covered in the 'digital economy' challenge, while the transport infrastructure is covered in the 'transport/accessibility' challenge, etc.). The filtering is done on the basis of the literature surveyed and the specific literature used in the analysis of each challenge.

The analysis of each challenge will start with a short description of the main policy areas of the challenge. In the 'digital economy' example, these are a) fragmented digital markets, b) lack of interoperability, c) cybercrime and low trust in networks, d) lack of investment in networks, e) insufficient research and innovation efforts and f) lack of digital literacy and skills. All of these policy areas are in one way or another important for the functionality or integration of the CE territory, as for instance the fragmentation of digital markets, cybercrime and weak networks have a negative effect on cross-border e-business, while the lack of interoperability and digital skills may impede the creation – and especially the use – of transnational platforms or e-services.

Each challenge and policy area is analysed in more detail using up-to-date data and information. The importance of each policy area in contributing to the overall challenge will be identified mainly via a) the differences within the CE territory that may be an obstacle to integration and the development of functional relationships and b) the benchmarking of the CE territory against the EU average to compare its overall performance. Where useful, the analysis will also use information and conclusions from policies and strategies, as well as studies.

The analysis of the challenges and their policy areas will be indicative of potential policy needs, i.e. areas where TNC can actively play a role in increasing the functionality of and capacity within the CE territory. Using the results, the analysis identifies potential policy measures, also based on successful TNC project examples, to tackle the challenges and their respective policy areas.

The following section contains analysis of the 10 challenges in the following order:

1. Globalisation/competitiveness
2. Digital economy
3. Infrastructure
4. Energy
5. Circular economy/environment
6. Climate change
7. Skills and employment
8. Social risks
9. Demography
10. Governance.

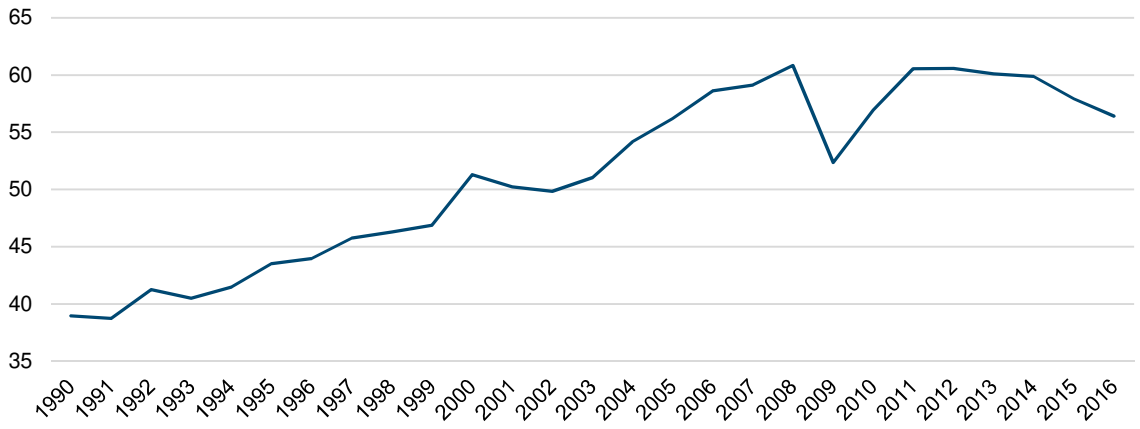
Given the large number of challenges, the analysis of each one is more by way of an overview, rather than a detailed and in-depth analysis. Still, for each challenge and its respective policy areas, the most important points, features and effects on the CE territory are highlighted, thus allowing an assessment both of the importance of the challenges for the future of Central Europe and of potential TNC policies to address those challenges.

2.2. GLOBALISATION

2.2.1. Globalisation challenge

Globalisation is not a recent phenomenon, but it has intensified significantly in recent years and has become one of the key issues for economic policy makers, especially in the wake of the latest global financial crisis. It is difficult to give a complete and unequivocal definition of this economic phenomenon – it is rather 'the multifaceted synthesis of a vast number of factors of different nature – economic, social, technological etc.'[6] For the purpose of our analysis, we consider globalisation to be increased flows of goods, services, capital, people and information across borders. Figure 2.1 shows one of the dimensions of globalisation – an increasing share of trade in world GDP starting from 1990. Though in the aftermath of the recent financial crisis the trend has gone somewhat into reverse, in 2016 the share of trade in global GDP was still 17 percentage points (p.p.) higher than in 1990. This implies rather dramatic shifts in the structure of the economies adjusting to new patterns of global demand.

Figure 2.1 / Share of trade in global GDP, %

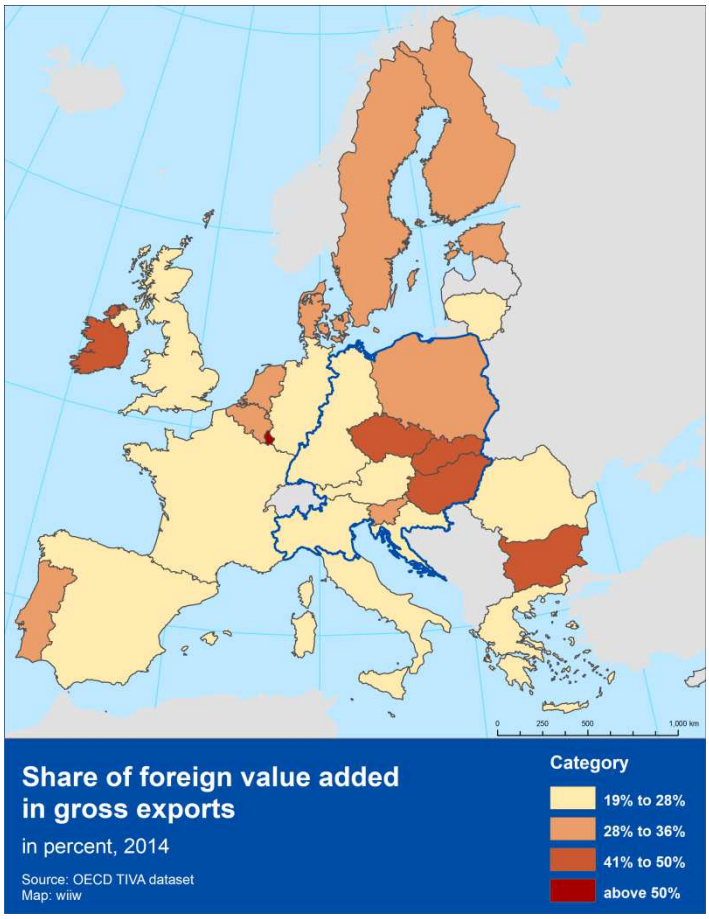


Source: WDI dataset.

Another feature of globalisation has been the emergence of global value chains (GVC) and the implied cross-border production sharing between countries. Manufacturing activity in the EU has become increasingly concentrated in the Central European 'manufacturing core', implying divergent paths of structural change across individual EU Member States. The degree of a country's integration into GVCs is illustrated in Figure 2.2: the Czech Republic, Slovakia and Hungary, which serve as major production facilities for the EU machinery and transport equipment industry, are characterised by a share of foreign value added in their gross exports of over 46%. Austria, Italy and Germany, by contrast, export relatively more domestically created value added (the share of foreign value added in their gross exports is below 27%).

[6] EU Commission, 2009.

Figure 2.2 / Share of foreign value added in gross exports in 2014, %



Note: Blue line indicates CE territory
Source: OECD TIVA dataset.

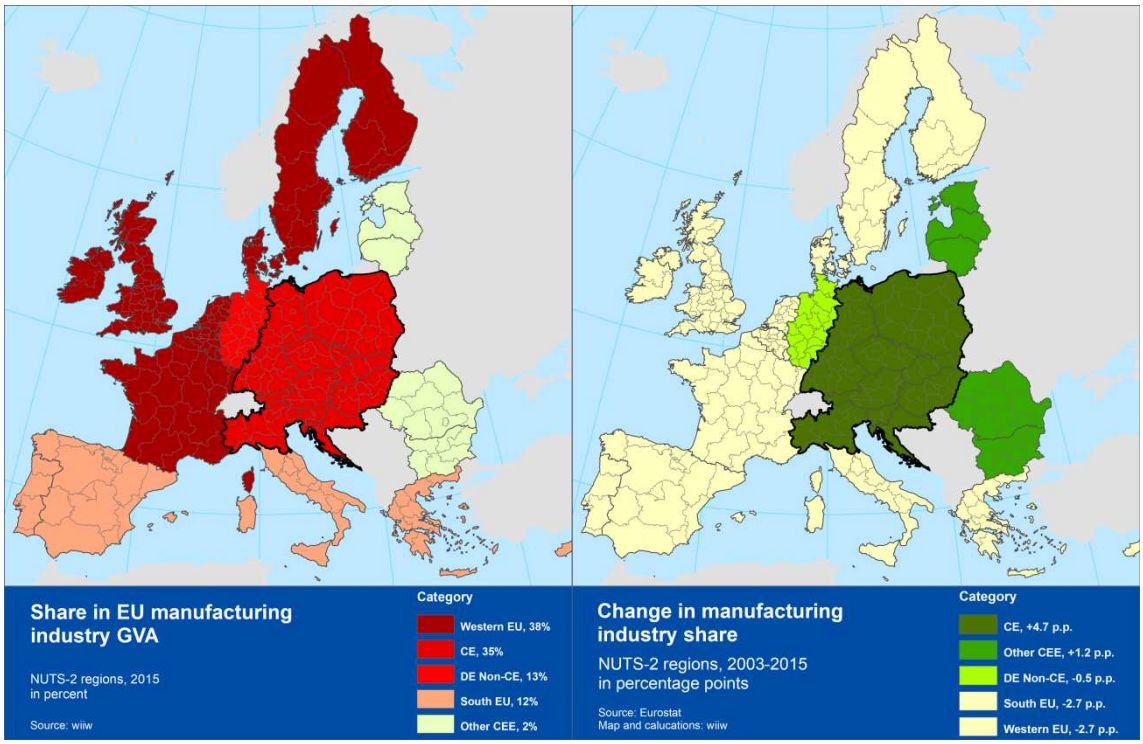
Another consequence of the emergence of GVCs was the increase in concentration of manufacturing activity in the EU in the so called Central European 'manufacturing core'. It consists of Austria, the Czech Republic, Germany, Hungary, Poland and Slovakia.[7] For CE purposes this area is slightly re-defined by including Northern Italy and Slovenia as well as excluding those German regions not being part of the CE programme area (see Figure 2.3 left graph). This adjusted industrial core ('CE') produced around 35% of total manufacturing industry gross value-added (GVA) in 2015. It was only surpassed by Western EU regions that in total had a share of 37.8%, though 11% thereof was produced by UK regions and hence will have to be deducted after Brexit. German regions not in the CE programme are ('DE Non-CE') accounted for 13%, Southern EU countries for 12% and the other CEE countries for 2% of total EU-28 manufacturing GVA in 2015.

Looking at the changes in manufacturing GVA shares strengthens the notion of the CE region being the EU's industrial core (see Figure 2.3 right graph). From 2003 to 2015 the CE region's share in EU manufacturing GVA increased by 4.7 percentage points, while the share of all other regions, except

[7] Hanzl-Weiss et al., 2018.

those in the other CEE countries decreased. This is the results of strong re-industrialisation trends in the CE countries and the continuous de-industrialisation in Southern and Western EU countries.

Figure 2.3 / Shares in manufacturing gross value added and changes therein by country groups, %



Source: Eurostat and wiiw.

Globalisation gives the EU better access to other countries' markets and resources. 'Greater trade flows and economic growth have increased prosperity, transforming the lifestyles of Europe's citizens and lifting millions worldwide out of poverty. But globalisation also confronts us with new economic, social, environmental, energy and security challenges.'[8] Challenges of globalisation are directly linked to the level of economic development, global competitiveness and global integration of regions. If economic agents are characterised by low productivity, bad connectivity/accessibility to other parts of the world, poor technological development and infrastructure, lack of skilled labour and know-how, they would be forced to undergo painful structural adjustments. Living standards would fall as enterprises relocate to places with more favourable conditions; rising competition from imports would threaten local enterprises; and there would be a loss of jobs and a reduction in the real wages of unskilled workers.[9] There is also a risk that globalisation will encourage further consolidation of path dependency at the regional level: as comparative advantages of low-cost, low-wage production methods continue to shift towards emerging economies, regions lacking the capacity to develop a knowledge-based economy are likely to become more exposed.[10]

8 EU Declaration on Globalisation, European Council Presidency Conclusions, Brussels, 14 December 2007.

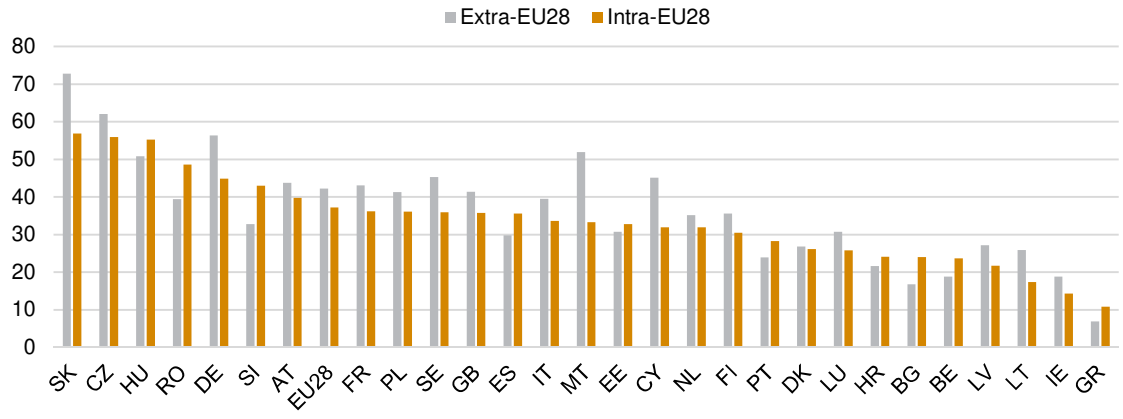
9 EU Commission, 2009.

10 EU Commission, 2008.

Figure 2.4 shows the degree of export concentration across EU countries. It demonstrates that in Slovakia and the Czech Republic, machinery and transport equipment account for more than 60% of extra-EU-28 goods exports. If we look at intra-EU trade, this sector accounts for more than 50% of merchandise exports of these two countries and Hungary.

The picture that emerges is one of a very strong specialisation along the value chain, which is associated with relatively little value creation (compared to research and development (R&D) and headquarter services, for example). This type of specialisation might become a 'functional trap' for several CE countries, meaning that the region risks ending up as a 'permanent semi-periphery' with a high degree of economic dependence on the Western 'core' EU countries, and income levels never reaching those of the leading economies.[11]

Figure 2.4 / Share of machinery and transport equipment in merchandise exports in 2017, %



Source: Eurostat.

The EU Commission has developed a so-called 'globalisation vulnerability index' to understand which regions of the EU are most exposed to the challenges of globalisation.[12] The index is based on how regions score on selected indicators which have been projected to the year 2020 (see Table 2.1) and is presented in relative terms (0 is the best score, and 100 the worst).

[11] Stöllinger, 2018.

[12] EU Commission, 2009a.

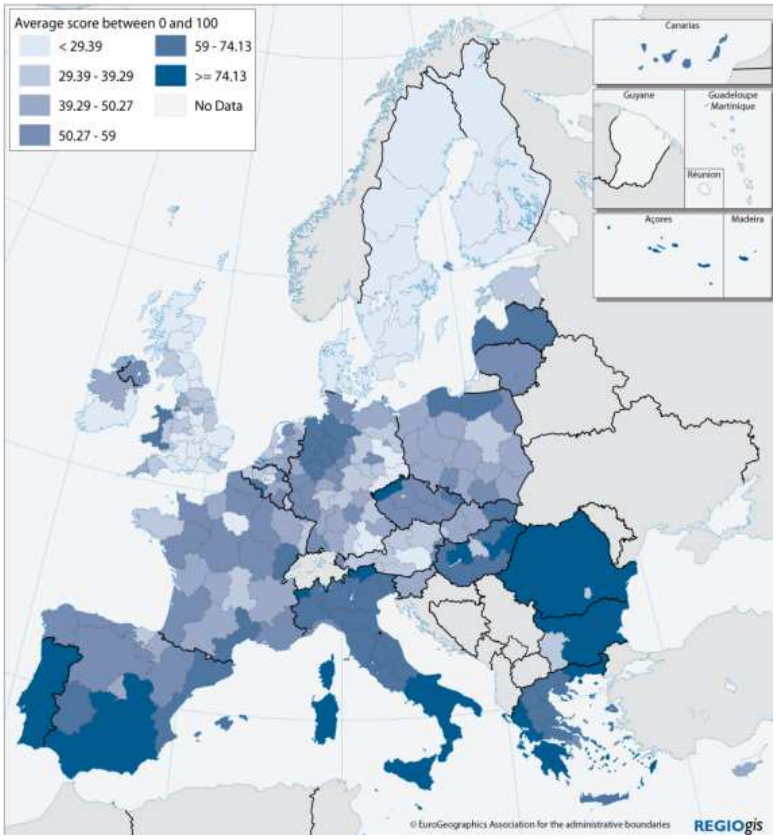
Table 2.1 / Indicators of the globalisation vulnerability index

	Indicator	Rationale
(1)	Productivity growth	Productivity growth is not only key to ensuring a competitive economy in a global context; it is also an important source of growth as demographic decline makes it difficult to increase total employment.
(2)	Employment rate	The employment rate projections show a substantial increase by 2020 to 70% from 63% in 2005. Nevertheless, major disparities will remain between regions, with several regions having employment levels below 55%.
(3)	Unemployment rate	
(4)	High educational attainment	As the EU's economy moves towards a more service-based economy and away from manufacturing, it will create fewer jobs for low-skilled labour. Currently in the EU, 29% of people aged 25-64 lack a complete secondary education, this will only drop to 25% in 2020. Labour productivity depends to a large degree on the education level of the labour force. The challenge will be, on the one hand, to provide training to people without a complete secondary education and find new ways of creating low-skilled jobs. On the other hand, it is important to increase the rates of high educational attainment, in particular in regions lagging behind on this indicator.
(5)	Low educational attainment	

Source: EU Commission, 2009a.

The resulting map of the European regions' vulnerability to globalisation is presented in Figure 2.5. The most vulnerable regions appear to be in Southern Europe, as well as in Southeast and Central and Eastern Europe.

Figure 2.5 / Globalisation vulnerability index, 2020



Source: EU Commission, 2009a, Globalisation Challenges for European Regions.

The sources of vulnerability were already addressed in the Lisbon Strategy, whose goals included labour market reform, product market reform, completing the Single Market, improving the business environment and raising the EU's innovating capacity. The more recent Europe 2020 strategy, launched in 2010, also recognised the need to deal with the challenges of globalisation. It includes, among other things, the following flagship initiatives: industrial policy, which entails improving the business environment; modernising labour markets by facilitating labour mobility and the development of skills; and improving access to finance for research and innovation, in order to strengthen the innovation chain and boost investment.

The European Commission's cohesion policy aims to reduce the differences between regions and to ensure convergence across Europe. The European Structural and Investment Funds (ESIF) are among its main tools. Developing a Research and Innovation Strategy for Smart Specialisation (RIS3) is currently a prerequisite for receiving funding from the European Regional Development Fund (ERDF). Established in 2011, the Smart Specialisation Platform (S3P) assists Member States and regions to develop, implement and review their RIS3 strategies by providing information, methodologies, expertise and advice. These include a focus on identifying niche areas of competitive strength, solving major societal challenges, and innovation partnerships.[13] The most relevant categories of policy instruments to deal with the globalisation challenges at both EU national and regional levels are found to be aid schemes, infrastructure development and education and training.[14]

2.2.2. Globalisation – policy areas

The following sections analyse in more detail two crucial policy areas in the field of globalisation – industrial policy and innovation – and the role TNC could play in the implementation of these policies. Another important policy area – skills upgrade – is dealt with extensively in the section on 'Employment and skills'.

2.2.2.1. Industrial policy

Description

The Treaty on the Functioning of the European Union (TFEU) links industrial policy to competitiveness. According to Article 173 of TFEU, the objective of the EU's industrial policy is to provide the appropriate conditions for making the EU's industry internationally competitive. This objective recognises that, while businesses themselves are ultimately responsible for their success or failure in the global market, industrial policy can support firms (or whole industries) in acquiring international competitiveness. (These broad definitions do not confine industrial policies to manufacturing, but rather mean that they should encompass the entire value chain of firms and the whole spectrum of the economy.)

Influencing a country's (or a region's) position in the global economy is all the more important, as global value chains are becoming more 'fragmented' and there are increasing options for countries and regions to plug themselves into international and regional production networks. The role of publicly provided

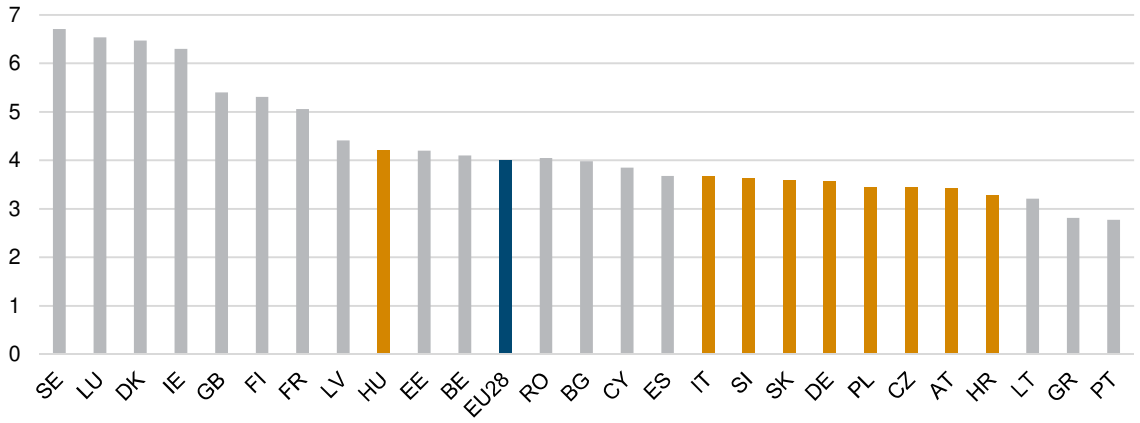
[13] https://ec.europa.eu/jrc/en/research-topic/smart-specialisation

[14] Ismeri Europa, 2009.

'specific inputs' is therefore relevant not only at the industry level, but also in supporting the local production of particular 'fragments' in international production activity.[15]

Despite the strong industrial base of many CE countries, industrial policy can still make important contributions to their development. First, policies could support the technological change of existing firms, thus preserving their competitiveness and demand for labour. In particular, ICT adoption is crucial for technology transfer and the ability of countries to participate successfully in higher value-added activities in GVC, and can significantly impact the competitiveness of countries. Figure 2.6 shows that all countries of the CE territory, apart from Hungary, have lower shares of ICT employment than the EU-28 average. This means that the region's ICT sector's development could be one of the goals of industrial policy in the region.

Figure 2.6 / Persons employed in ICT services in 2015, share of persons employed in total business economy, %



Source: Eurostat.

Secondly, policies could support the networking of firms within the CE territory, foster cooperation, create market opportunities and make both the companies and the region as a whole more resilient to global competition. Thirdly, they can support the emergence of new sectors and firms, thereby contributing to the growth and development of CE countries and regions.

A large number of policies, programmes and initiatives, covering a wide variety of fields, currently contribute to EU industrial policy. Special attention is paid to the support of small and medium-sized enterprises (SMEs), in particular through the EU Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME). The main policy goals of the programme are:

- Facilitating access to finance in all phases of SME lifecycle – creation, expansion or business transfer;
- Helping businesses to access markets in the EU and beyond through the Enterprise Europe Network that helps SMEs find business and technology partners and understand EU legislation

[15] Landesmann, 2015.

through the Your Europe Business portal, which provides practical information on doing business within Europe;
- Strengthening entrepreneurship education, providing mentoring, guidance and other support services;
- Improving business conditions by reducing the administrative and regulatory burden on SMEs.

TNC policy options

Industrial policy intervention, which is directed at reducing or overcoming entry barriers, counteracting coordination failures and providing public goods, will have to take place at different levels, depending on their geographic scope and scale. At the regional or sub-regional level, advantages include the easier involvement of all relevant actors ('embeddedness') in the information-gathering process and the potential to cater more precisely to the 'specific input' needs of a particular region or sub-region or a geographically defined cluster of activities. On the other hand, the disadvantage might include the easier 'capture' of the decision-making process by powerful local groups and the smaller range of alternatives that could be weighed up, so that the best option is chosen. Furthermore, capture might also lead to less transparency in the process. As a counterbalance, the authorities could be involved at a higher level (national or supra-national) to provide information on comparative projects, provide standards, undertake additional evaluations, supply technical know-how that is not available at the regional or sub-regional level, and increase the level of transparency by publishing cross-regional evaluations, etc.[16]

TNC is an important component of EU industrial policy, as is evidenced by the large number of projects in this area. One example is the CE 2007-2013 SMART FRAME project, which focuses on strengthening existing technology-oriented SMEs and on increasing the total number of such SMEs. Another example is the CE 2007-2013 AutoNet project, which focuses on a) new services and policies to support innovation and technology transfer in the automotive industry, b) innovation support services and policies for regions where these are underdeveloped or missing, c) innovation in the automotive industry, and d) promotion of the CE territory and its actors as the key region for creating new innovative processes, materials or products in the automotive industry.

Other examples include inter alia the CE 2007-2013 projects C-Plus (cluster creation and cooperation), Clusters-Cord (cluster cooperation), CNCB (Cluster and Network Cooperation for Business Success in Central Europe), ClusterCOOP (cluster development), NANOFORCE and PLASTiCE (new environmentally friendly and sustainable solutions in the packaging and end-user industries).

2.2.2.2. Innovation

Description

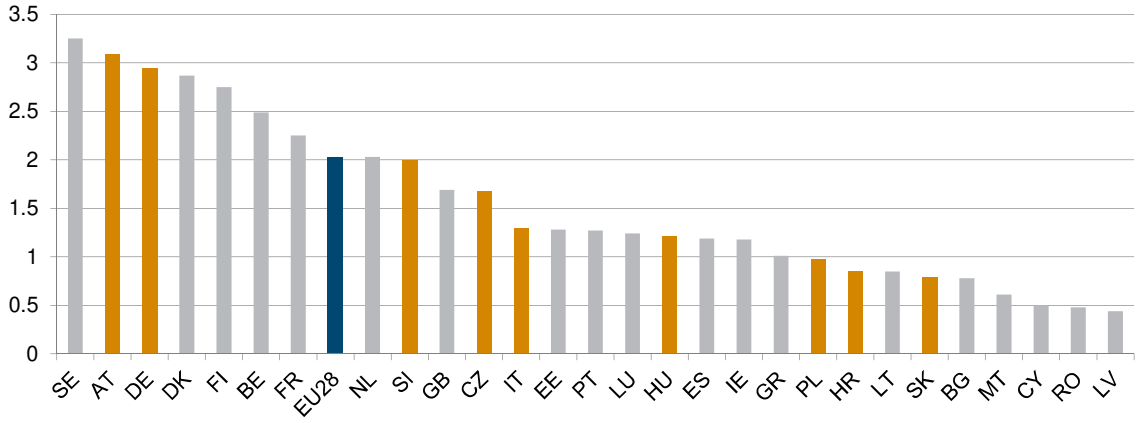
Innovation has become a crucial aspect of competitiveness in the globalised world. At the same time, the EU has been underinvesting in research and development, compared with its main competitors of China and the US. In recognition of this issue, the EU has come up with the Europe 2020 flagship initiative Innovation Union. The main aspects of this initiative include:

[16] Landesmann, 2015.

- Taking collective responsibility for a strategic, inclusive and business-oriented research and innovation policy to tackle major societal challenges, raise competitiveness and generate new jobs;
- Prioritising and protecting investments in the knowledge base, reducing costly fragmentation and making the EU a more rewarding place for innovation and bringing ideas to market; and
- Agreeing to launch European innovation partnerships, pool resources and expertise to find solutions to societal challenges and build competitive advantage in key markets.

Innovation is a key issue, as well as a key problem in the CE territory, especially for the Eastern CE countries. Figure 2.7 illustrates the large differences in the level of R&D spending across the CE territory, with Germany and Austria having very high rates (around 3% of GDP). All other CE countries (except Slovenia) are lagging behind, also compared to the EU average: their R&D spending ranges from 2% of GDP in Slovenia to around only 0.9% or 0.7% in Poland, Croatia and Slovakia. These low R&D rates are a concern not only for the long-run competitiveness of countries, but also for their long-term development path. If these countries maintain their low R&D spending rates, they risk being stuck in a 'middle-income trap', unable to converge with more advanced countries like Austria or Germany. Hence, the CE territory would be separated into high- and medium-income countries. This would have negative consequences for the functionality of the CE territory, as the differences in income and living standards would be hard to accept from an economic, social and political point of view for some Eastern CE countries.

Figure 2.7 / Research and development spending in 2016, % of GDP



Source: Eurostat.

In recent years, the EU Commission has called on national and regional authorities to develop smart specialisation strategies for research and innovation (R&I). The aim has been to encourage all European regions to identify their specific competitive advantages as a basis for prioritising R&I investment under cohesion policy in 2014-2020. Smart specialisation strategies (S3) are expected to complement cohesion policies, since it is necessary for all EU policies and instruments to work together in a

coordinated manner across governance levels, in order to move towards resilient, inclusive and sustainable growth at the territorial level.[17]

It has been argued that better integration of cohesion and R&I policies is needed, as the scope of the concept of 'research and innovation excellence' – as defined in the Framework Programme – is quite narrow and would de facto exclude many activities that are seen as central to driving economic developments in less-developed and transition regions.[18] A broader approach would mean that funds are directed not only to the generation of new knowledge, but also to the exploitation of existing knowledge and the transfer of technology. This would require regional policy to develop its own criteria of relevance in R&I, which should go beyond those proposed by the Directorate-General for Research and Innovation.[19]

The following main challenges need to be addressed in order to increase the synergy of R&I and cohesion policies:[20]

- Boosting the innovation and competitiveness potential of European regions, as a basis for a sustainable growth model;
- Increasing interregional cooperation, which is a key element in globalised economies;
- Strengthening the focus on less-developed and industrial-transition regions; and
- Improving and building on joint work across EU policies and programmes supporting innovation.

In terms of the sectoral focus of S3 policy areas, the following priority sectors have been identified:[21]

- Energy and environment
- Public health, medicine and life sciences
- Agro- and bio-economy
- Advanced materials and nanotechnology
- Transport and mobility
- Advanced manufacturing systems
- ICT and electronics.

TNC policy options

The period 2007-2013 has shown that TNC in the CE territory is an excellent tool to promote R&D and innovation across the CE countries and regions. The number of projects dealing with these challenges has been very high. Among other things, the CE 2007-2013 projects focused on a) facilitating the growing together of the different research, technology and innovation systems, b) stimulating technology-transfer and knowledge-exchange mechanisms, c) removing barriers for the diffusion of innovation in regional SMEs, d) improving the innovation performance of SMEs in main manufacturing and industrial service sectors, e) increasing the potential of CE regions for technology transfer,

[17] Communication from the Commission, 2017.

[18] Foray et al., 2018a.

[19] DG Research and Innovation, 2017.

[20] Communication from the Commission, 2017.

[21] Radosevic and Walendowski, 2016.

competitiveness and trade on a transnational level, and f) facilitating innovation management and many other issues.

The list of CE projects in the field of innovation is long and includes, among others, Centrope_tt, FREE, INNOTRAIN IT, PROINCOR, CEBBIS, ACCESS, FLAME, IntraMED-C2C and CentraLab. The projects of the Interreg CE Programme that deserve particular attention include in particular KETGATE (key enabling technologies), InnoPeerAVM (advanced manufacturing), 3DCentral (Smart Engineering and Rapid Prototyping), PPI2Innovate (innovation procurement), FabLabNet, NUCLEI (Open innovation in the advanced manufacturing industry) and AMiCE.

2.2.3. Summary

Globalisation is a highly diverse challenge, consisting of many different policy areas that all – in one way or another – affect the competitiveness of the CE countries and regions, and thus their attractiveness for investment and as places to live and work. Thus, tackling the globalisation challenge requires not only policies addressed in this section – industrial policy and innovation – but also policies mentioned in other chapters. Tackling the globalisation challenge also needs cooperation within the CE territory, as is recognised in the EU S3P. Smart specialisation strategies are about enabling regions to turn their needs, strengths and competitive advantages into marketable goods and services. They aim to prioritise public research and innovation investments through a bottom-up approach for the economic transformation of regions, building on regional competitive advantages and facilitating market opportunities in new inter-regional and European value chains.

Not only are the CE countries tightly linked to one another in terms of trade and value-added chains, but many of them are also small, open economies that can easily be affected by shifts in global trade flows. Therefore, cooperation between CE countries, regions, firms, innovation systems, etc. helps to make the CE territory more resilient to outside shocks. Much more than this, it is also a factor in bringing the CE countries closer together, in both economic and social terms, thus making the CE territory a more genuine functional area.

2.3. DIGITAL ECONOMY

2.3.1. Digital economy challenge

In a nutshell, the digital economy includes all economic activities, transactions and interactions that in one way or another are affected by ICT. The rapid increase in the use of ICT has led to a digital transformation of global 'economies and societies by changing the ways people interact, businesses function and innovate, and governments design and implement policies'.[22] And, given the speed of this transformation, ICT 'is no longer a specific sector but the foundation of all modern innovative economic systems'.[23]

The challenge of the digital economy lies in the speed and scale of the digital transformation. Keeping up with it, learning to apply ICT in both the private and the business sphere to improve and stay competitive, using the technologies to innovate and develop new products and services – in short, maximising the economic and social potential of the digital economy requires equally rapid and comprehensive adaptation on the part of the private and public sectors. Because of the many dimensions in which digitisation transforms traditional economies, such measures need to be holistic rather than aimed at a single target.

To illustrate these dimensions, the OECD[24] has identified eight so-called 'vectors of digital transformation':

- **Scale**: Major digital products or services, like software and data, have a potential for large economies of scale, since they incur fixed costs, but have low – almost zero – marginal costs. This allows firms and platforms to scale very quickly, often with few employees, tangible assets or a geographical footprint.
- **Scope**: Digitisation allows for unprecedented complexity in products and services, with standardisation allowing components from different sources to work together at a global level.
- **Speed**: ICT speeds up communication, business, the circulation of information and innovation at a dramatic rate; this takes place against the backdrop of legacy time frames, slow institutional processes, entrenched behaviours and limited human attention.
- **'Soft' capital**: Intangible sources of value, like software and data, are of growing importance. Many of the data can be generated from physical goods (internet of things), so that they become a hybrid of good and service.
- **Value mobility**: Software and data can be stored or exploited anywhere, decoupling value from specific geographical locations.
- **Intelligence** at the edges: The 'end-to-end' principle of the internet has moved the intelligence of the network from the centre to the periphery. Computers and smartphones allow users to design and construct their own networks through mailing lists and social networks, thereby creating distinct communities.
- **Platforms and ecosystems**: ICT not only led to an acceleration in the distribution of information and bilateral communication (via emails, messenger services), but also to the

[22] OECD, 2017.

[23] EU Commission, 2015a.

[24] OECD, 2017.

development of 'platforms', i.e. digitally empowered multi-sided markets or 'meeting places'. Varying in their degree of openness to outsiders, they serve private and public bodies for business, collaboration, education and many other purposes.

- **Loss of place**: Fuelled by value mobility and the internet facilitates a borderless creation and transaction of value.

As a response to the multidimensional digital economy challenge, the EU has come up with an equally comprehensive set of policies and strategies. These are manifested inter alia in the Digital Agenda for Europe,[25] the Digital Single Market Strategy[26] and plans for digitising European industry.[27] The EU policies address a large number of areas, where they can play a major role in tackling the digital economy challenge. These include:[28]

a. Fragmented digital markets
b. Lack of interoperability
c. Cybercrime and low trust in networks
d. Lack of investment in networks
e. Insufficient research and innovation efforts
f. Lack of digital literacy and skills.

Transnational cooperation can make an important policy contribution to most of these areas. Not only does it contribute to general EU policies and strategies: much more tellingly, these areas are fundamental for the integration of digital and non-digital markets. By addressing them, TNC supports the creation of a functional geographical area, by bringing people, businesses and administrations closer together.

These areas are analysed in more detail below.[29] The analysis includes a short description of each area, including, where applicable, information on why it is of special relevance to the CE territory. Furthermore, the analysis highlights potential TNC policy options, including, where possible, actual examples.

2.3.2. Digital economy – policy areas

2.3.2.1. Fragmented digital markets

Description

EU online markets are still highly national. Particularly commercial and cultural content faces difficulties in flowing across borders, given the differences in Member States' regulatory frameworks, including

[25] EU Commission, 2010a.
[26] EU Commission, 2015a.
[27] EU Commission, 2016a.
[28] EU Commission, 2010a and EU Commission, 2016a.
[29] The analysis does not cover 'investment in networks', as it is considered to be an area where Interreg TNC can contribute much less than other EU policies.

payment and invoicing systems and dispute resolution.[30] Added to these are issues like unjustified geo-blocking (i.e. the denial of access to websites based in other Member States for commercial reasons), the lack of a high-quality and cost-transparent cross-border parcel delivery, an EU copyright framework that is in need of modernisation (e.g. it prevents the cross-border use of content services) and VAT rules that give third-country suppliers a competitive advantage over EU suppliers in EU online trade.[31] Thus, there is still a long way to go to arrive at a functioning Digital Single Market within the EU.

This fragmentation of the digital markets in the EU certainly has repercussions for the CE territory, as it a) is not favourable to further cross-border integration of the CE business and private sectors and b) potentially slows down economic development of the CE countries, especially reducing the potential growth of SMEs, which generally have more difficulty in implementing ICT solutions and benefiting from a Digital Single Market.

The existing fragmentation of the CE territory is illustrated in Figure 2.8 and Figure 2.9. Figure 2.8 shows the percentage of SMEs that reported electronic sales to other EU countries in 2017. Figure 2.9 shows the same for large enterprises.

There are large cross-country differences in the online sales of enterprises. In Austria, the Czech Republic, Germany and Slovenia, the shares of SMEs selling online are not only higher than the EU-28 average, but are also among the highest across the EU. By contrast, SMEs in Croatia, Hungary, Italy, Poland and Slovakia participate in online foreign trade to a much lesser degree.

In the case of large enterprises, the situation is more or less similar: Austrian, Czech, German and Slovenian – but also Slovak – firms are among the most active in online sales abroad in the EU. In turn, Italian, Hungarian, Polish and Croatian enterprises have below-average online sales.

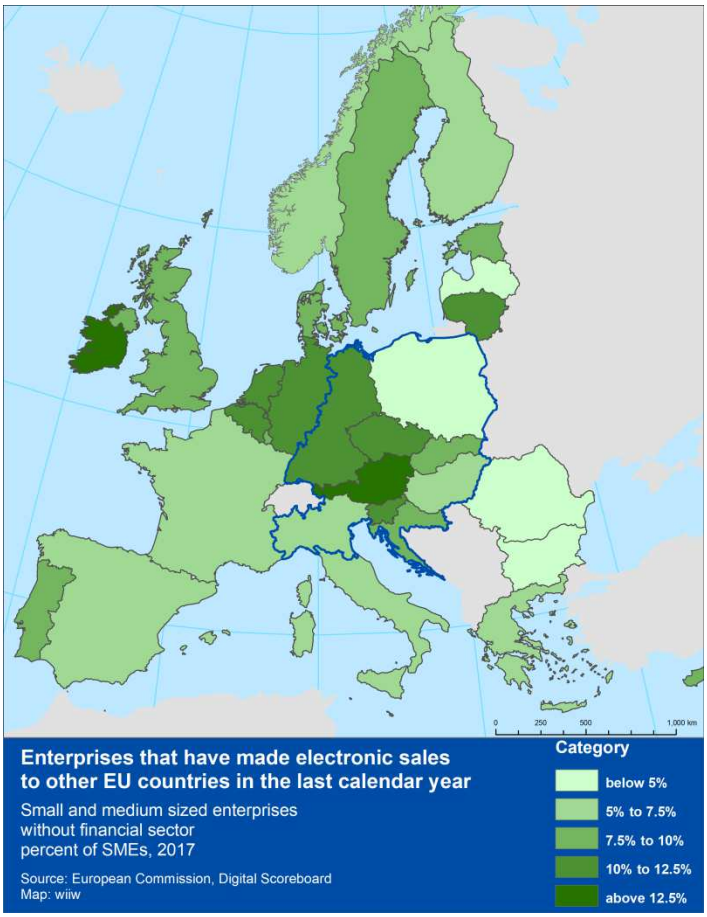
The data reveal big differences between large enterprises and SMEs in their propensity to engage in online trade. Large enterprises engage in online trade to a far higher degree than do SMEs. On the one hand, this may be due to differences in the economic activity, which may be much more localised for SMEs than for large enterprises. Yet, it may not be completely ruled out that SMEs have a disadvantage in exploring foreign markets, given that such activities could be cost-intensive (e.g. hiring specialised personnel) and risky. Given that, creating a Digital Single Market that is easily and smoothly accessible to SMEs, including start-ups, could be a potential source of economic growth.

[30] EU Commission, 2010a.

[31] EU Commission, 2015a.

Figure 2.8 / Enterprises that have made electronic sales to other EU countries in the last calendar year, 2017 – SMEs (10-249 persons employed), without financial sector

Percentage of SMEs



Note: Blue line indicates CE territory
Source: European Commission, Digital Scoreboard.

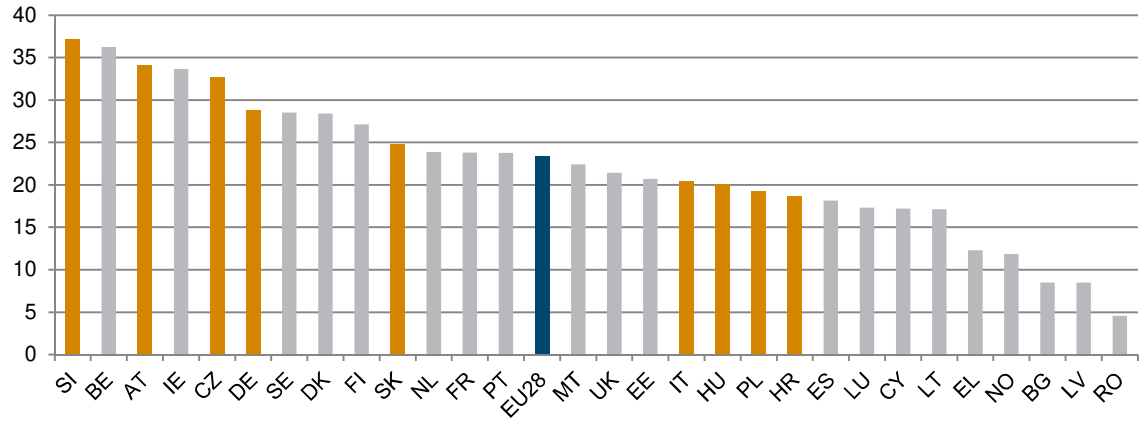
For this, the causes underlying the fragmented Digital Single Market need to be removed. Given the nature of these causes, this is mostly an EU-wide agenda that requires changes to the EU regulatory framework. For example, recent progress has been made by the 2017 abolition of retail mobile-phone roaming charges and the portability regulation (from April 2018) that allows consumers to access their online subscriptions to films, sports events, e-books, video games and music services while travelling in other EU countries.[32] Other regulatory changes that ensure a functioning Digital Single Market still need to be implemented, though. This concerns digital contract rules, rules on cooperation between national consumer protection authorities, as well as regulations on cross-border parcel delivery services and simpler VAT declaration procedures.[33]

[32] EU Commission, 2017b.

[33] As of February 2018.

Figure 2.9 / Enterprises that have made electronic sales to other EU countries in the last calendar year, 2017 – Large enterprises (250 or more persons employed), without financial sector

Percentage of large enterprises



Source: European Commission, Digital Scoreboard.

TNC policy options

Although many of these changes are implemented at the European or national level, there are some options for TNC to contribute to the integration of the digital market. First, given the large differences in participation in the digital market by the firms of CE countries, TNC could promote the necessary digital skills to participate in the digital market. One example would be the Interreg Europe Skills+ project, which seeks to advance public policies promoting ICT skills among SMEs in rural areas, to help them use the opportunities offered by a Digital Single Market.

Secondly, TNC in the CE territory could continue to support the creation of general or sector-specific digital platforms and initiatives that help to improve cross-border business-to-customer or business-to-business relations. These platforms could cover a wide range of activities, including online advertising platforms, marketplaces, search engines, social media and creative content outlets, application distribution platforms, communications services, payment systems, etc. An example of this is the Interreg CE I-CON[34] project, which provides a platform for SMEs in the food sector. By linking SMEs' cross-sectoral competences in design, mechatronics and labelling to food processing, the project aims at increasing the competitiveness of food SMEs in CE by enhancing their potentials along the food value chain.

[34] http://www.interreg-central.eu/Content.Node/I-CON.html

2.3.2.2. Interoperability

Description

Interoperability addresses a number of areas, e.g. a) the communication between digital components and devices (relating to the internet of things), b) the communication and connection along the supply chains of industry and service sectors and c) the domestic and cross-border communication and connections between communities, public services and authorities (e-government).[35] Especially points b) and c) seem to be relevant for the CE territory, as both may have strong effects on the functional relationships between different CE countries and regions, as well as on their economic and social integration.

A key issue in strengthening interoperability is standardisation. More standardisation can help in the development of a) new technologies, products and services, b) new production and construction processes and c) more efficient ways of communication (e.g. e-health, e-government). The main instrument to increase the level of standardisation at the European level is the EU Rolling Plan for ICT Standardisation,[36] which covers a multitude of areas in need of standardisation – from key enabling technologies (e.g. internet of things, cloud computing, etc.) and societal challenges (e.g. e-health, e-learning, etc.) to innovations for the Digital Single Market (e-procurement and e-invoicing, financial technologies, etc.). It has been pointed out that in order to ensure that standardisation keeps pace with technological change, increased efforts are needed.[37]

TNC policy options

One important area where TNC in the CE territory could contribute to ICT interoperability is the cross-border communication of public services. Although there is a current EU programme (ISA2)[38] and framework[39] addressing these issues at the European level, there seems to be an important role left for TNC to strengthen the cross-border communication of CE regions and countries via ICT solutions (particularly in view of the relatively small budget for ISA2).[40] This is illustrated by two current Interreg CE projects: the digitalLIFE4CE project,[41] which seeks novel solutions in the field of digital integrated healthcare systems, and the INTENT project,[42] which aims to find solutions for innovative patient-centred cancer care. Another example of a cross-border cooperation project is the DIGINNO project of the EU Strategy for the Baltic Sea Region.[43] It focuses on a) the uptake of ICT in the business sector, b) innovation and interoperability of public services and c) cooperation and coordination of digital policies at a macro-regional level. Regarding interoperability, the main output of the project will be show-case

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35 EU Commission, 2015a.

36 DG Growth, 2017.

37 EU Commission, 2015a.

38 Interoperability solutions for public administrations, businesses and citizens, https://ec.europa.eu/isa2/isa2_en

39 European Interoperability Framework.

40 Around EUR 131 million for the period 2016-2020 (Decision (EU) 2015/2240 of the European Parliament and of the Council).

41 http://www.interreg-central.eu/Content.Node/digitalLIFE4CE.html

42 http://www.interreg-central.eu/Content.Node/INTENT.html

43 https://www.diginnobsr.eu/

models of government-to-business cross-border e-services, including recommendations for policy makers to develop and implement such services.

2.3.2.3. Cybercrime and low trust in networks

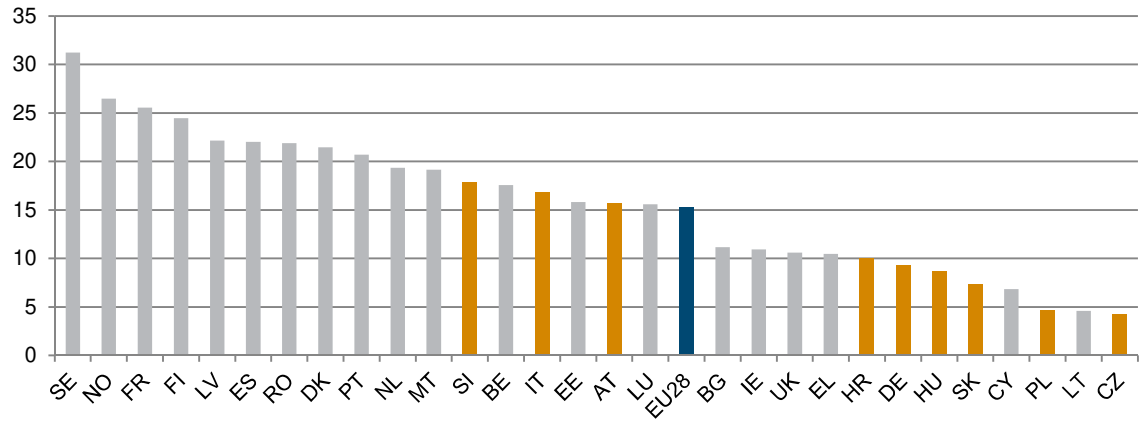
Description

A safe and trustworthy digital network is essential for the Digital Single Market in the EU and digital integration of the CE territory. This is illustrated in Figure 2.10, which shows the percentage of people who have been deterred from buying online at least once because of security concerns. Interestingly enough, the CE countries seem to be very trusting in this respect.

At the same time, the number of cyberattacks is increasing rapidly. To illustrate the point, in 2016 more than 4,000 ransomware attacks occurred daily, whereby digital criminals gained access to a victim's computer and threatened to publish the data or permanently block access to it unless a ransom was paid. This was three times the figure in 2015.[44] One fundamental problem of cybercrime is that in many cases it is cross-border, while law enforcement is strictly national. Because of this, cybersecurity is a top priority on the EU agenda, e.g. manifested in the EU Cybersecurity Strategy and institutionalised through the European Union Agency for Network and Information Security (ENISA) and Europol. For all that, the cross-border nature of cybercrime also opens up some opportunities for TNC to contribute to cybersecurity.

Figure 2.10 / Security concerns kept individuals from ordering or buying online

Percentage of individuals (aged 16-74), 2015



Source: European Commission, Digital Scoreboard.

TNC policy options

First of all, TNC in the CE territory could support the build-up of industrial capacities in cybersecurity, in both the private and the public sphere. Secondly, TNC could contribute to a better coordination of public

[44] EU Commission, 2015a.

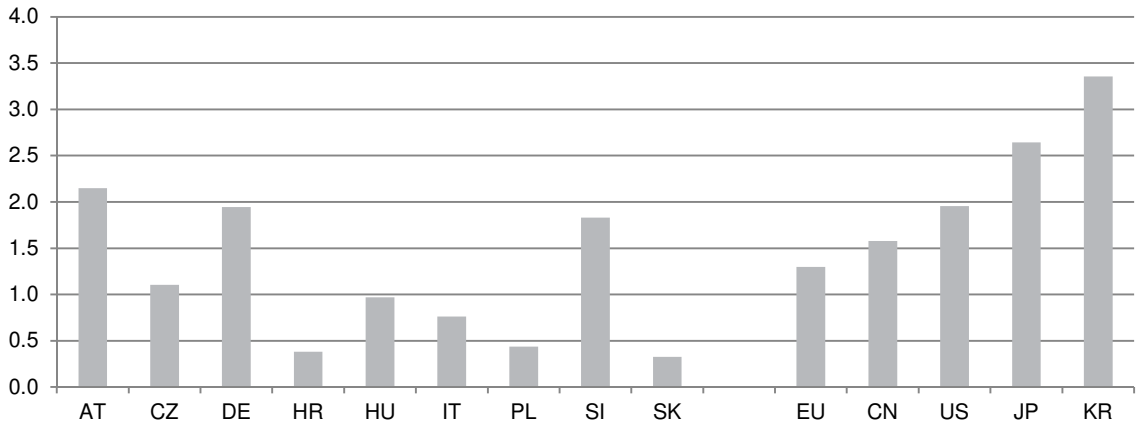
services in charge of cybersecurity, potentially leading to more efficient cross-border efforts to prevent or prosecute cybercrime. Thirdly, many of the CE projects develop ICT-based services, solutions or platforms, which in general can be considered to be trustworthy. Given the fact that only 22% of Europeans have full trust in companies such as search engines, social networking sites and email services,[45] this contribution of the CE projects should not be underestimated.

2.3.2.4. Research and innovation efforts

Description

There is a notion that the EU could gain major global competitive advantage if it could generate a wave of bottom-up digital innovation involving all industrial sectors across Europe.[46] Yet currently, the realisation and exploitation of such an advantage seem to be running at below potential, given the continuous underinvestment in ICT-related research and innovation in the EU. Thus, around 60% of large industries and more than 90% of SMEs feel as though they are lagging behind in digital innovation'.[47] Also in international comparison the EU performs worse in ICT-related research and innovation than its main global competitors. In 2014, EU Business Enterprise R&D spending on ICT was only half of Japanese and only 40% of South Korean spending (in terms of GDP, see Figure 2.11). The EU also invested less than China and the US in 2014.

Figure 2.11 / ICT-related Business Enterprise Research and Development (BERD) spending, as % of GDP, 2014



Source: JRC Predict Dataset 2017, Eurostat, World Development Indicators.

To boost Europe's digital innovation capacities, in 2016 the Commission adopted the 'Digitising European Industry' strategy.[48] It foresees the creation of digital innovation hubs across Europe. These hubs should combine digital competence centres (which have generated economic benefits in terms of competitiveness and business creation in those regions that have already invested in them) with actions

[45] EU Commission, 2015a.

[46] EU Commission, 2016a.

[47] EU Commission, 2016a.

[48] EU Commission, 2016a.

or institutions to facilitate access to finance, and with outreach and brokerage actions.[49] Additionally, the strategy highlights the importance of partnerships to pool public and private resources in order to a) finance the large investments needed for high-performance computing and data infrastructure for science and engineering and b) coordinate the fragmented research and development and innovation (R&D&I) in key technology fields. This coordination also includes the alignment of regional, national and EU strategies, as examples show that the combination of public funds and policies can have a high leverage effect in raising additional private investment. Such partnerships provide 'unique means to support large-scale federating initiatives such as pilot lines for production or large scale reference implementations bridging the so-called innovation "valley of death" and translating research ideas into marketable products and services'.[50]

TNC policy options

TNC can be a powerful platform to promote ICT R&D&I at both the national and the regional level. In contrast to larger-scale EU wide programmes like Horizon 2020, which may be attractive only to those actors that already have a high level of ICT R&D, Interreg TNC could be more inclusive by covering regions and actors with different R&D levels. This is all the more important given the large differences in ICT R&D levels and potentials in the CE regions (see Figure 2.11), where countries with high R&D levels – such as Austria, Germany and Slovenia – form a functional area with countries characterised by low levels of ICT-related R&D. An example of the role that TNC could play is the Interreg CE NUCLEI project,[51] which aims to establish a transnational innovation management model in the CE regions and to create a transnational pool of knowledge that supports advanced manufacturing innovation beyond regional borders. Another example is the Interreg CE 3DCentral project,[52] which aims at connecting 'islands of innovation' to a stable network of regions for innovation. It is focused on smart engineering and rapid prototyping, where a substantial, current and future emerging market for cooperation partners is visible.

2.3.2.5. Digital literacy and skills

Description

The digital transformation is expected to have major repercussions for the labour markets, as new types of jobs are created, while other jobs will be transformed or even disappear. Over the past 10 years, the employment of ICT specialists in the EU has grown by around 2 million.[53] But since the demand for digitally skilled employees is growing at around 4% a year and the supply of an adequately trained workforce is not keeping pace, the EU might face a shortage of ICT professionals of around 825,000 unfilled vacancies by 2020.[54]

[49] EU Commission, 2016a.

[50] EU Commission, 2016a.

[51] http://www.interreg-central.eu/Content.Node/NUCLEI.html

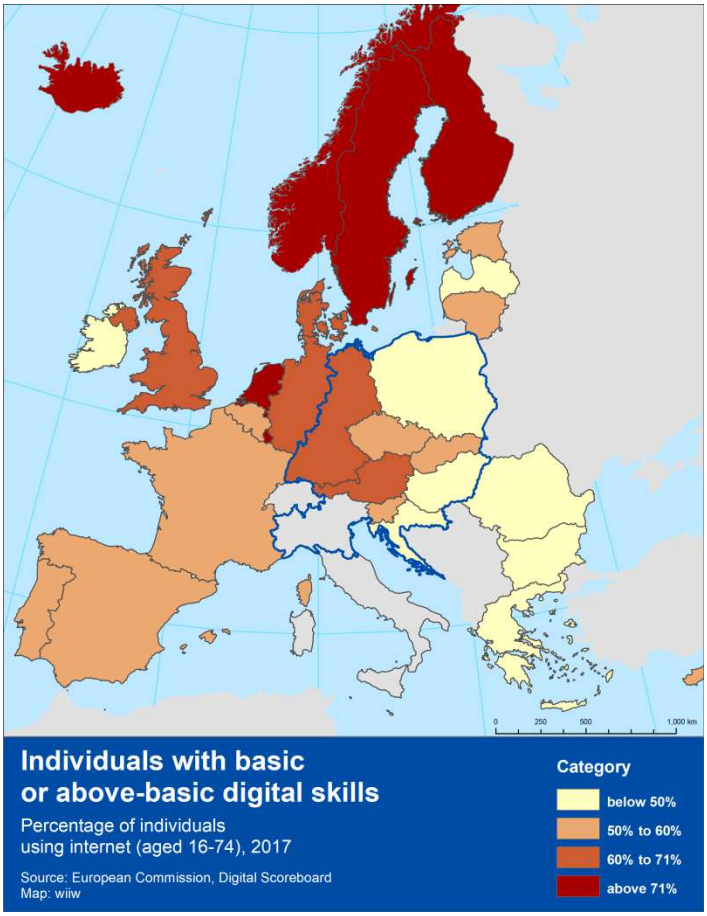
[52] http://www.interreg-central.eu/Content.Node/3DCentral.html

[53] EU Commission, 2017b.

[54] EU Commission, 2015a.

Figure 2.12 / Individuals with basic or above-basic digital skills, 2017

Percentage of individuals using internet (aged 16-74)



Note: Blue line indicates CE territory. No data for Italy.
Source: European Commission, Digital Scoreboard.

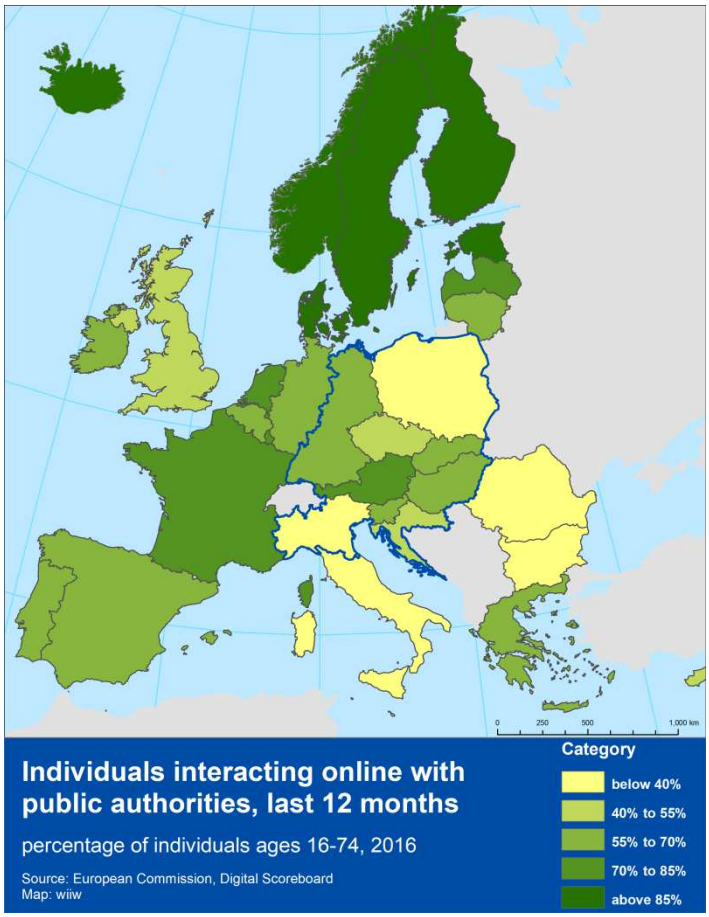
Currently, around 90% of all jobs require at least some level of digital skills; and such skills are also becoming increasingly important for those who want to engage in social and civic activities.[55] Even though the EU labour force is adapting to the digital needs, overall progress is slow and quite differentiated across countries, as Figure 2.12 suggests. That is, on average 60% of the EU population has basic or above-basic digital skills. Yet, this also means that 40% still have inadequate levels of digital skills. The CE countries are a good example for the differentiation across Europe: whereas in Austria and Germany, around two thirds of the population have acquired at least basic digital skills, less than half of the workforce has done so in Croatia, Poland and Hungary. In the Czech Republic, Slovakia and Slovenia, the share of the population with at least basic digital skills is around the EU average.

But it is not only private digital skills that tend to differ across the EU in general and the CE territory in particular; 'public' skills also vary a lot. This is illustrated by the statistics on online interactions with public authorities by individuals. Figure 2.13 shows this information at the European level and Figure 2.14 specifically shows the CE NUTS-2 regions.

[55] EU Commission, 2017b.

At the European level, the data indicate that in the CE territory (except for Austria) the share of individuals communicating online with public authorities tends to be below the EU average; and in Italy and Poland, the Czech Republic and Croatia, partly far below it. In turn, the NUTS-2 regional data suggest that within the CE countries, digital interactions are somewhat more common in the more urbanised, mostly capital city regions than in rural regions.

Figure 2.13 / Internet use: Online interaction with public authorities, 2017, % of individuals

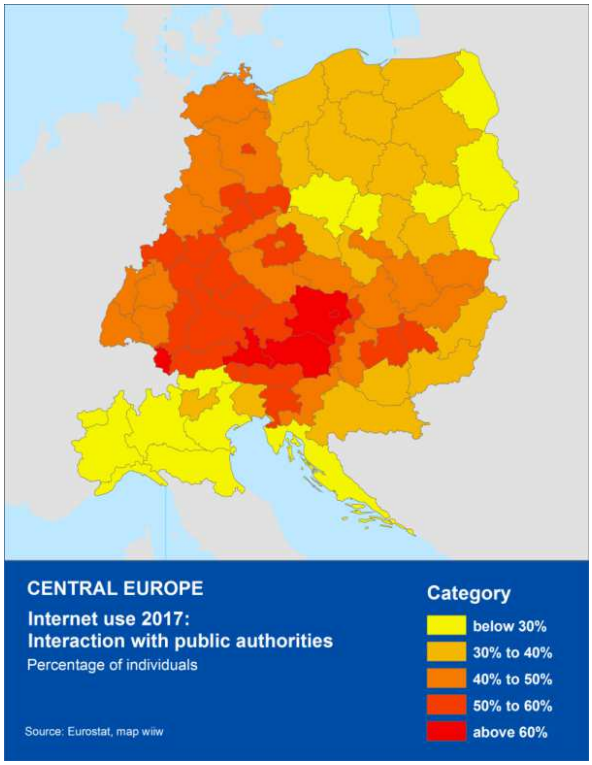


Note: Blue line indicates CE territory
Source: European Commission, Digital Scoreboard.

To improve digital literacy at the European level, in 2016 the Commission adopted the New Skills Agenda for Europe. It includes actions to raise the basic skills of the adult population, including digital skills. Additionally, the Digital Skills and Jobs Coalition intends to mobilise businesses, social partners and public authorities to improve digital skills and the employability of people. Like the New Skills Agenda, though, the Digital Skills and Jobs Coalition is in its initial phase (with the pilot scheme Digital Opportunity to be rolled out in 2018). Given the slow progress, there are concerns that the supply of digital skills will be insufficient to meet growing demand. Thus, more action and progress in digital skills is demanded by the EU Commission.[56]

[56] EU Commission, 2017b.

Figure 2.14 / Internet use: Online interaction with public authorities, 2017, % of individuals, CE NUTS-2 regions



Source: Eurostat.

TNC policy options

As in ICT R&D&I, Interreg TNC provides a platform to promote digital literacy in less-favoured areas and regions, thus enabling them to participate in the digital markets in the EU in general, and in CE in particular. One example of the important role TNC could play is the Interreg Europe Skills+ project mentioned above. Another example is the Interreg Europe Erudite project,[57] which aims at enabling all stakeholders to contribute to and benefit from the digital economy and society, by building up partnerships between businesses, citizens and public administrations. Other project examples include the Anglo-French Project Pontoon,[58] which specifically addresses shortages in digital skills, the Danube Transnational Programme Excellence-in-ReSTI project,[59] which specifically aims at improving project management skills, and the Interreg North Sea Region CORA project,[60] which is intended to stimulate digital infrastructure, services and skills in rural areas. INNOTRAIN IT project facilitated innovation in SME by strengthening the performance of their IT departments through promoting Information Technology Service Management (ITSM). In turn, this should facilitate process and product innovations in the companies.

[57] https://www.interregeurope.eu/erudite/

[58] https://interreg5a-fce.eu/en/news-and-events/news/project-pontoon-to-tackle-digital-skills-shortage/

[59] http://www.interreg-danube.eu/approved-projects/excellence-in-resti

[60] http://northsearegion.eu/cora/

2.3.3. Summary

The analysis has thrown up a number of policy areas where TNC effectively already does – or in the future could – contribute to strengthening the digital economy in the EU and especially in the CE territory. Notably, although the priorities and objectives of the current Interreg CE Programme do not cover the digital economy challenge directly, indirectly the programme already makes a big contribution to tackling that challenge. Many of the CE projects use ICT to build up communication and platforms for both the private and the public sectors, provide ICT solutions or 'just' use ICT to make their results and projects known to a wider public. This is valid for all four CE Programme priorities.

What is more, if necessary – i.e. if the digital economy is considered to be a highly important issue to be addressed by TNC – it can easily be covered within the Interreg CE Programme. Most of the policy areas discussed – such as fragmented digital markets, lack of interoperability and digital skills, and inadequate research and innovation efforts – can be included in the CE innovation priority, targeting both the 'Sustainable linkages among actors of innovation systems' and the 'Skills and entrepreneurial competences' programme specific objectives.

There is no doubt that tackling the digital economy challenge in the CE territory will be a major step towards a higher degree of integration of the CE countries. Simultaneously, it will also strengthen the CE territory as a functional area, making cross-border commerce, the exchange of knowledge, the supply of private and public services – in short, cross-border communication and cooperation – easier and quicker. Therefore, it is recommended that future CE TNC programmes strengthen their focus on the digital economy challenge. This focus does not mean that it has to become a separate priority axis, though. Digitisation affects many different areas covered by TNC. It is important that future projects under any priority should, wherever possible, use digital opportunities to reach their goals.

2.4. TRANSPORT AND ACCESSIBILITY

2.4.1. Transport and accessibility challenge

Transport is fundamental to the economy. The mobility it provides is a driving force in the integration of EU and CE markets, as well as of people, fostering their cooperation and creation of networks. For this, a well-developed and safe transport infrastructure is crucial. Not only does such infrastructure provide access to markets and people, but also, due to its longer-run economic dimension, it reduces production costs, leads to efficiency gains through specialisation, and increases the likelihood of broad industrialisation for less-developed regions.[61] Additionally, in the short run, infrastructure construction can stimulate economic growth by increasing aggregate demand.

The importance of transport is reflected in the fact that it was one of the first common policy areas of the European Economic Community and has its roots in the Treaty of Rome (1957). After it was fully established by the Single European Act (1985) and the Maastricht Treaty (1986), EU transport policy, through infrastructure and legislative measures, as well as through research and innovation, took concrete steps not only to integrate EU countries into the Single Market, but also to make this integration environmentally sustainable and resource efficient.[62]

Despite transport making significant progress in connecting people and businesses in the EU in general and the CE territory in particular, some old challenges still remain, even as new ones appear. Thus, the completion of the internal market for transport is delayed by considerable bottlenecks and other barriers. Simultaneously, transport has to become more resource efficient and environmentally sustainable. This could partially be achieved through new technologies for vehicles and traffic management, but their introduction is both cost and research intensive.

Taking account of these challenges, the 2011 EU White Paper on transport highlights a number of areas that EU policy has to actively address.[63] A number of them are also of particular relevance for EU transnational cooperation, including:[64]

› A modern infrastructure connecting countries and regions
› Energy efficient and environmentally sustainable transport
› Safe transport.

These areas are analysed in more detailed below.

[61] In the sense of Rosenstein-Rodan's 'Big Push' theory – Rosenstein-Rodan, 1943.

[62] EU Commission, 2014.

[63] EU Commission, 2011a.

[64] EU Commission, 2011a, pp. 11ff.

2.4.2. Transport and accessibility – policy areas

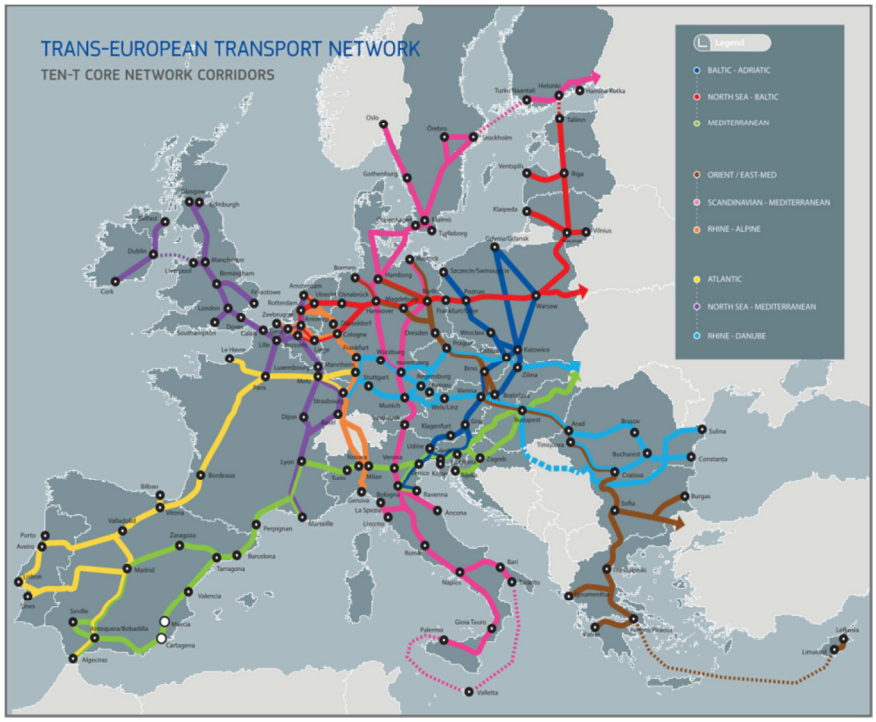
2.4.2.1. Transport infrastructure

Description

The basis for energy-efficient and environmentally sustainable transport is an adequate transport infrastructure that includes multimodal links between economic centres, transport hubs and border crossings, and that allows for the application of advanced technologies to keep transport flowing as smoothly and cleanly as possible. This lies at the core of the Trans-European Transport Network (TEN-T), the main EU transport infrastructure policy. It operates on two planning levels, both of which are of great importance for the CE territory.

The first level is the 'Core Network', which comprises nine Core Network Corridors that connect the most important nodes within the EU. The CE territory is a major part of seven of these nine corridors: a) the Baltic–Adriatic, b) the Mediterranean, c) the North Sea–Baltic, d) the Orient–East Med, e) the Rhine–Alpine, f) the Rhine–Danube and g) the Scandinavian–Mediterranean corridors.[65] This is illustrated in Figure 2.15.

Figure 2.15 / Ten-T Core Network Corridors



Source: www.railwaypro.com

[65] The CE region has also smaller connections to the other two corridors: the a) Atlantic and b) North Sea–Mediterranean corridor.

The main issue for the CE territory with these corridors is that all of them are plagued by bottlenecks and barriers that inhibit smooth-flowing transport. For example, in the Baltic–Adriatic corridor there are important problems on six cross-border rail and two cross-border road sections in terms of their compliance with the TEN-T requirements (i.e. PL–CZ, PL–SK, CZ–AT, AT–SK, AT–SI and SI–IT).[66] Similarly, in the Orient–East Med corridor, there are still missing links to most of the multimodal connections between countries, while cross-border traffic-management systems on rail and inland waterways still have to be implemented on many sections.[67] In the Rhine–Danube corridor, one of the main issues is the lack of cross-border rail network connections between Germany and its neighbours Austria and the Czech Republic.[68]

The second TEN-T planning level is the 'Comprehensive Network' level, which should cover all European regions, connecting them to the main transport routes and thus ensuring their accessibility. The importance of improving the regions' accessibility, especially in the CE context, has been shown in an earlier study.[69] This emphasised that the CE regions need to improve key network infrastructure and sustainable transport nodes, and it identified four major weaknesses of the CE regions:

- Weak local, regional and transnational accessibility, especially outside agglomeration areas and in the Eastern CE countries in general
- Lack of integrated transport systems and multimodality
- Low quality and declining role of public transport
- Missing road links and border crossings in many peripheral regions.

Since that earlier study, the data suggest that regional accessibility has improved somewhat. This is illustrated by two maps (Figure 2.16), one showing the growth of the motorway network and the other the growth of the road network in CE NUTS-2 regions[70] over the period 2010-2016.[71]

Both maps suggest that the accessibility of CE regions has improved in recent years. The motorway network has expanded greatly in the Czech Republic and Poland (though in the latter, construction was concentrated in certain regions), and also in the eastern regions of Slovakia and in Hungary, thereby closing existing infrastructure gaps. Thus, overall, the regions' high-speed road connections – so important for the long-distance, cross-border transport of goods and passengers – seem to have improved.

Also, internal accessibility, represented by the growth of the road network, has improved in many CE regions, especially in Slovakia and northern Italy, and to a lesser extent in Poland and Hungary. By contrast, accessibility has not changed for Croatian regions, and in the Czech Republic it may even have declined, since the road network shrank between 2010 and 2016.

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66 https://ec.europa.eu/transport/themes/infrastructure/baltic-adriatic_en

67 https://ec.europa.eu/transport/themes/infrastructure/orient-east-med_en

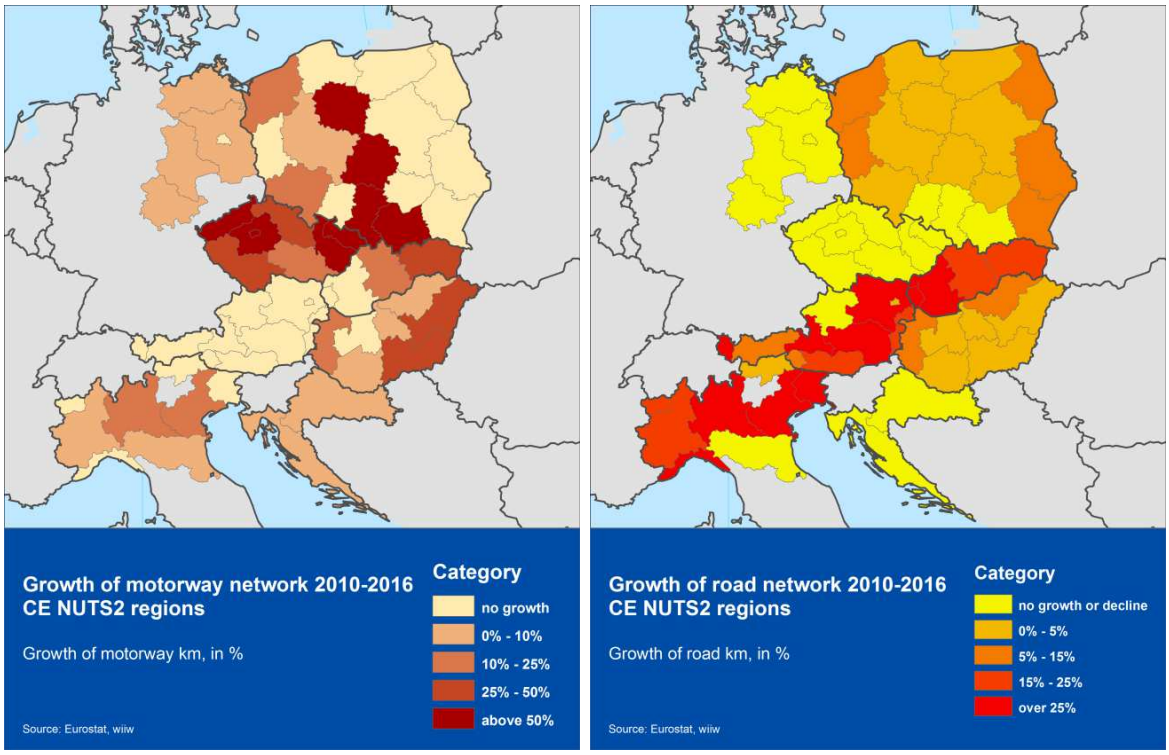
68 https://ec.europa.eu/transport/themes/infrastructure/rhine-danube_en

69 ÖIR and PAN IGiPZ, 2012.

70 Data were not available for all CE NUTS-2 regions.

71 Data for other regional transport infrastructure, such as rail or waterways, are too patchy to be used for analysis.

Figure 2.16 / Growth of motorway and road network, 2010-2016



Source: Eurostat, wiiw.

TNC policy options

Given the importance of the TEN-T network, which covers investments in roads, railway lines, inland waterways, maritime shipping routes, ports, airports and railway terminals, TNC needs to link up with this pan-European policy. The experiences from the period 2007-2013 show that, by focusing on the TEN-T networks, TNC can effectively contribute to the development of transport infrastructure in the CE territory through analytical, planning and investment preparation activities.

Examples of this are the CE 2007-2013 projects SoNorA and FLAVIA, which sought to improve multimodal infrastructure networks and accessibility through pre-investment studies, tools and new logistic services, as well as to update regional transport planning approaches and policies. Similarly, the project BATCo contributed significantly to the inclusion of the Baltic–Adriatic corridor in the TEN-T Core Network (in 2013) by providing scientific policy advice to major stakeholders.

The CE 2007-2013 EMPIRIC project provides an example of the preparation of infrastructure investment, while the Via Regia plus project focused on improving accessibility by developing a sustainable transport system, strengthening corridor nodes as ‘drivers’ of development and exploiting the tourist potential of the regions involved. Furthermore, the Interreg CE Programme as a whole aims to improve regional accessibility to the main transport networks. Based on this, the 2014-2020 Interreg CE project CONNECT2CE aims at tackling the weak accessibility of regional, peripheral and cross-border areas from main transport networks and hubs. Other recent Interreg CE projects with a similar aim are Peripheral Access, RUMOBIL and TRANS-BORDERS.

The potential support of TNC in developing waterways and in expanding the benefits of air transport have been demonstrated by the CE 2007-2013 projects INWAPO, CHAMPIONS and airLED.

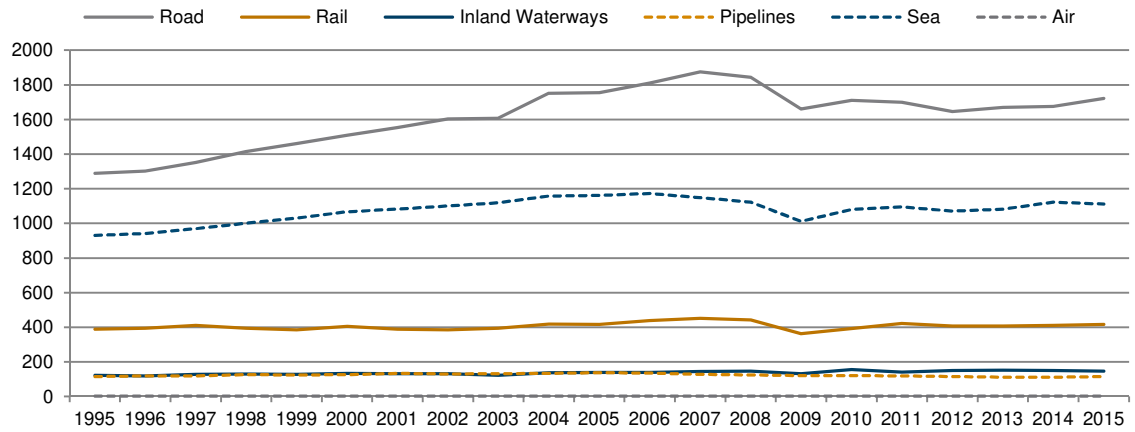
Overall, given the large amount of funds necessary to finance infrastructure investment, the role of TNC is not to provide infrastructure. Rather, through planning, pilot actions, feasibility studies and other analysis and activities, TNC enables this infrastructure to be built, thereby moving from a purely national point of view to a cross-border infrastructure development, which is vital for the functionality of the CE territory.

2.4.2.2. Energy efficient and environmentally sustainable transport

Description

To a large extent, the energy efficiency of transport and its environmental sustainability depend, apart from technology, on the modes used to move goods and passengers from one place to another. In 2015, around 50% of all goods in the EU were delivered via roads, i.e. around 1,700 tonne-kilometres (tkm),[72] 32% by sea, 12% by rail and 4% by inland waterways (see Figure 2.17).

Figure 2.17 / EU goods transport by mode, in tonne-kilometres



Source: DG MOVE, 2017.

In passenger transport, roads are even more important. Thus, in 2015, 71% of all passenger transport, i.e. 4,700 passenger-kilometres (pkm),[73] relied on cars, with an additional 2% of passengers using motorbikes. Air transport accounted for around 10% of passenger transport, buses for 8%, rail for 7% and local trams and metros for only 1.6% (see Figure 2.18).

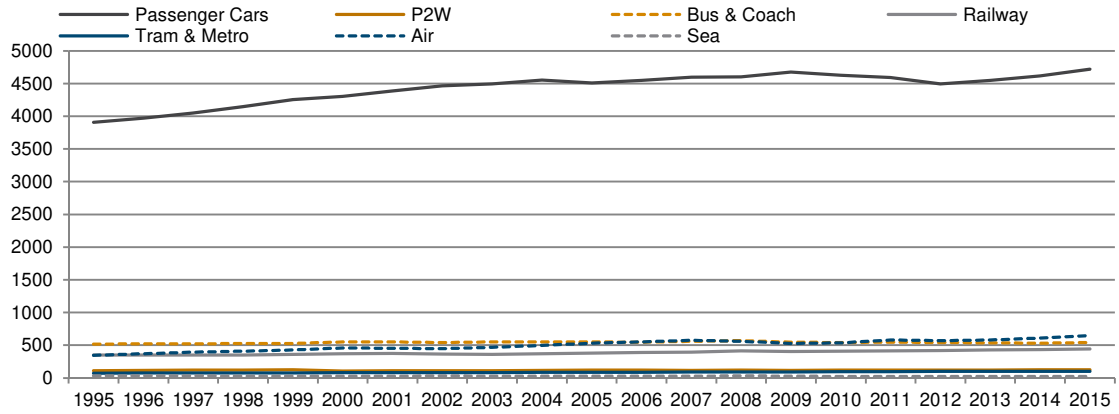
[72] A tonne-kilometre, abbreviated as tkm, is a unit of measure of freight transport which represents the transport of one tonne of goods (including packaging and tare weights of intermodal transport units) by a given transport mode (road, rail, air, sea, inland waterways, pipeline, etc.) over a distance of 1 kilometre. http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Tonne-kilometre_(tkm)

[73] A passenger-kilometre, abbreviated as pkm, is the unit of measurement representing the transport of one passenger by a defined mode of transport (road, rail, air, sea, inland waterways, etc.) over 1 kilometre. http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Passenger-kilometre

What is more, over time road transport has become more important in goods transportation, increasing its share from 45% in 1995 to 49% in 2015. In passenger transport, road transport has become slightly less important (from 73% in 1995 to 71% in 2015), mainly losing out to air transport, which gained market share. Over the same period, the share of rail transport stayed constant in passenger transport and declined slightly in goods transport.

Given this, much of transport's energy efficiency and environmental sustainability depends on the developments in road transport, and thus is connected to the use of fossil fuels.

Figure 2.18 / EU passenger transport by mode, in passenger-kilometres



Source: DG MOVE, 2017.

There is no doubt that the supply of fossil fuels will decline and become more uncertain in the future. Given the high, partly transport-related, oil dependency of the EU,[74] this could have severe negative effects on the economies and competitiveness of the EU countries, and thus on the welfare of its population.

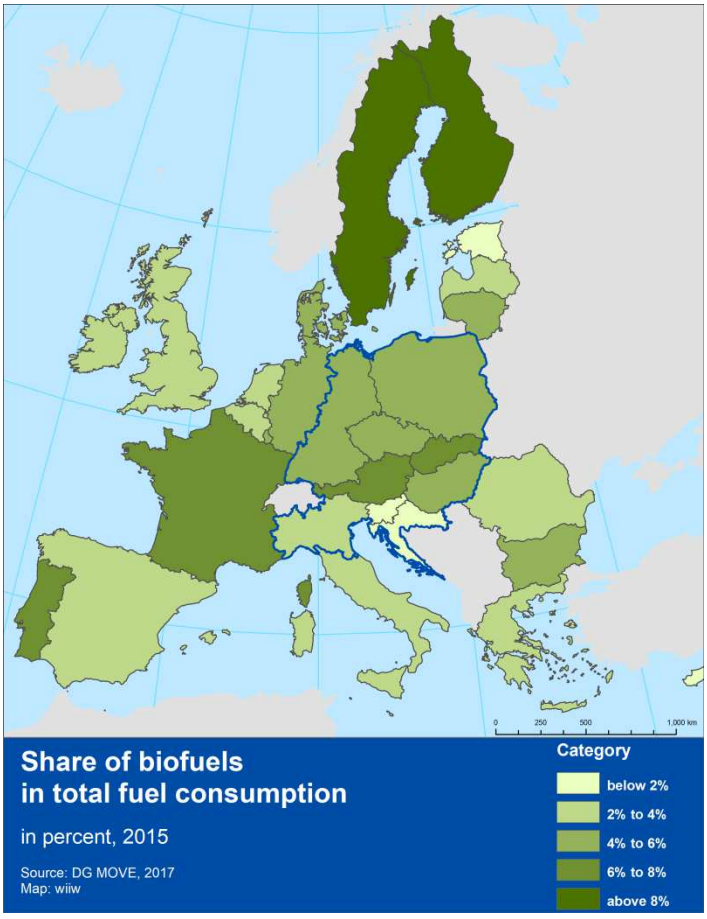
Technical progress has made transport more cost effective and energy efficient, yet it has not fundamentally changed since the big oil crisis more than 40 years ago.[75] Despite having become more energy efficient, transport still satisfies 95% of its energy needs with fossil oil and only 5% with biofuels (figures for 2015). This is illustrated in Figure 2.20, which shows the share of biofuels in total fuel consumption. Biofuel consumption varies considerably across the CE countries: in Austria and Slovakia, the share of biofuels in total fuel consumption is around 7–8% (placing those countries 3rd and 4th in the EU-28), whereas in Croatia and Slovenia the figure is below 2% (placing them 25th and 27th). In all other CE countries, the biofuel share is comparable to the EU average. At the same time, the examples of Finland and Sweden show that the CE territory still has a sizeable potential for catching up, so far as the use of biofuels is concerned. That is, for a more sustainable transport sector it is not only necessary to raise the consumption of alternative fuels within the CE territory, but also to increase its energy potential in general.

[74] In 2010, the oil import bill was around EUR 210 billion for the EU as a whole (EU Commission, 2011a). For more on that see the section 'Energy'.

[75] EU Commission, 2011a, p.3.

One way to reduce emissions is to replace conventional vehicles with electric vehicles. However, the degree to which this helps depends significantly upon the source of the electricity used to charge vehicles. Nevertheless, e-vehicles are still a negligible entity in most of Europe and particularly in the CE territory. Data published by the European Alternative Fuels Observatory suggests that the share of Plug-in electric vehicles (PEV, including battery electric vehicles and plug-in hybrid electric vehicles) in new passenger car registrations was 1.7% in Europe in 2017 and (far) below 1% in most of the CE countries. Here, only Austria had a share above the average (2.1%). Germany was close to the average, followed by Hungary with a share of 1%. In most of the other parts of the region also the use of incentives for electric cars is less pronounced[76].

Figure 2.19 / Share of biofuels in total fuel consumption, in %, 2015



Note: Blue line indicates CE territory
Source: DG MOVE, 2017.

Although transport has also become cleaner, the increase in the volume of transport makes it a major (and still growing) source of greenhouse gas (GHG) emissions (see Figure 2.20). A Commission analysis suggests that, in order to meet the climate change goal of keeping temperature increase below

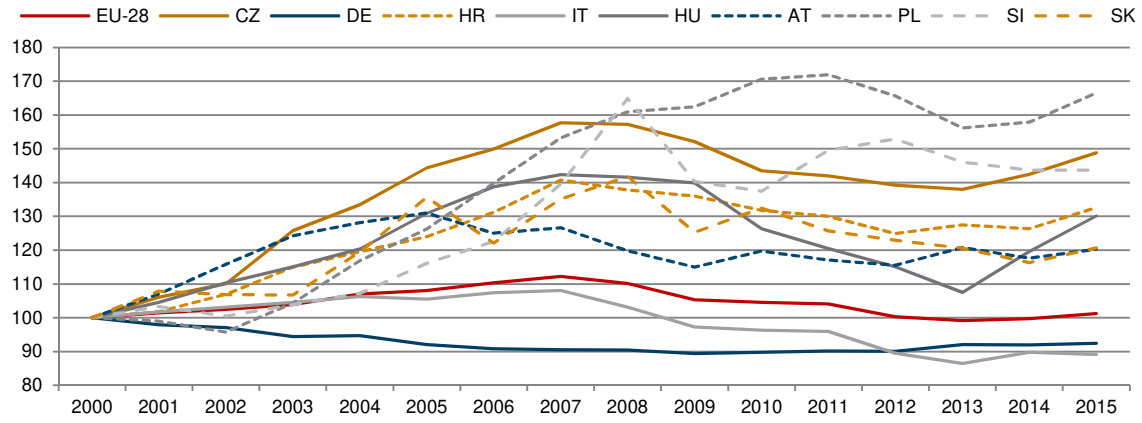
[76] EEA, 2016a

2 °C compared to pre-industrial levels, the transport sector will have to reduce GHG emissions by 20% compared to 2008 levels (and by 50% compared to 1990 levels) by the year 2050.[77]

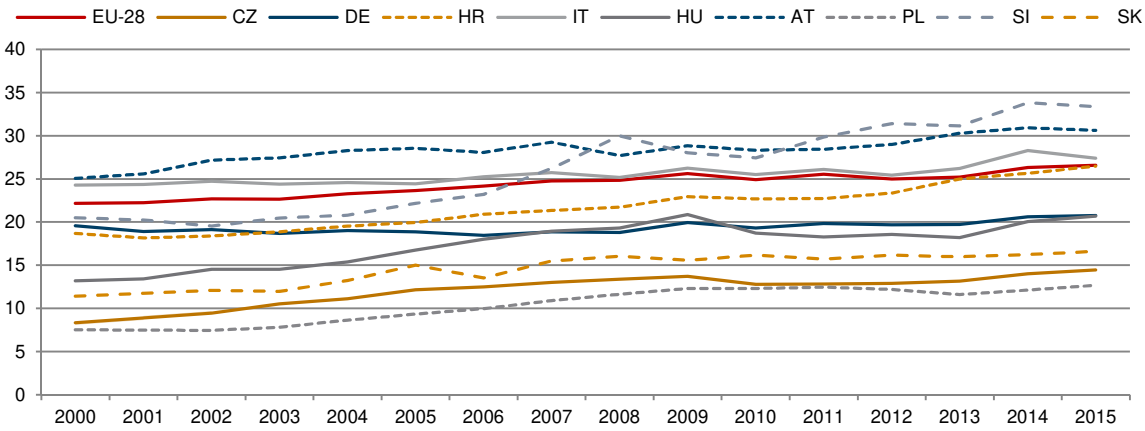
Figure 2.20 shows the development of the transport sector's GHG emissions over time (lower graph), as well as the share of its GHG emissions in total country GHG emissions (upper graph). The upper graph shows that in the CE territory only two countries, Italy and Germany, reduced their GHG emissions from the transport sector in the period from 2000 to 2015, while in all other countries such emissions increased. This growth was strongest in Poland, where transport GHG emissions increased by more than 66% from 2000 to 2015; it was followed by Slovenia and the Czech Republic (plus 40-50%).

Figure 2.20 / Transport greenhouse gas emissions growth and as % of total country greenhouse gas emissions

Greenhouse gas emissions, in million tonnes of crude oil equivalent, 2000=100



Transport greenhouse gases in total country greenhouse gas emissions



Source: European Environment Agency (EEA), June 2017.

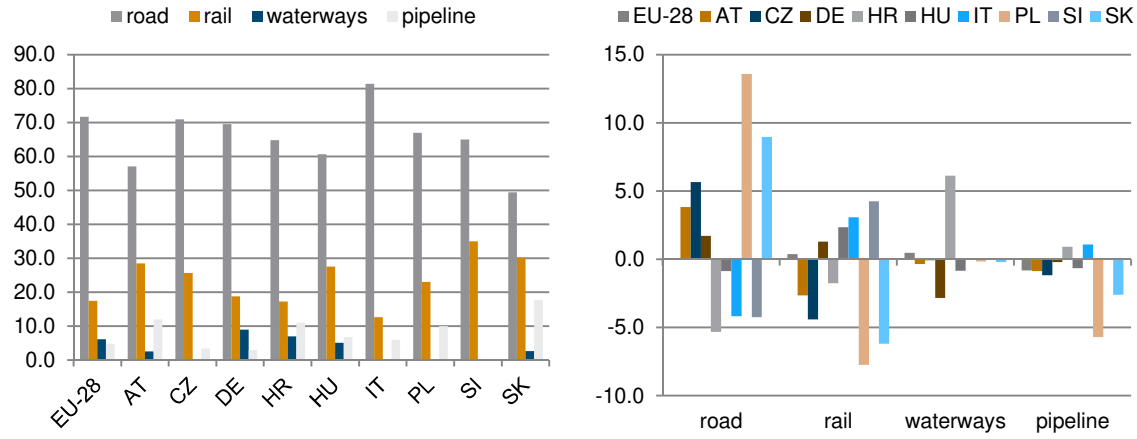
The lower graph indicates that the growing GHG emissions in the transport sector also made the sector more important in terms of total country GHG emissions. This can be observed for all CE countries,

[77] EU Commission, 2011b.

including Germany and Italy. Thus, the share of the transport sector in total GHG emissions tends to vary greatly across CE countries, from 30-33% in Slovenia and Austria to only 12-16% in Poland, the Czech Republic and Slovakia. Part of this difference is explained by the high share of industry in the latter countries; given its lower technical standards for GHG emissions, industry there is a more important GHG polluter than it is in Austria, for example.

Figure 2.21 / CE goods transport by mode, in tonne-kilometres

Left graph: mode shares 2015, Right graph: change in shares 2005-2015



Source: DG MOVE, 2017.

An important element in the reduction of transport GHG emissions is the shift to more sustainable transport modes. This refers on the one hand to a shift from the long-distance road transport of goods to rail or waterway transport, while for short distances, especially within cities, it refers to a shift to green forms of public transport.

The use of various transport modes and changes therein in the CE countries are shown in Figure 2.21 for goods transport and Figure 2.22 for passenger transport. As far as goods transport is concerned, in most CE countries (except Italy) the use of roads is lower than in the EU-28 on average. Within CE, the lowest share of roads in goods transport is found in Slovakia and Austria, though even in these countries roads accounted for 50% or more of all goods transport in 2015. The share of roads is also low in Hungary and is approaching the EU average in Slovenia, Poland, Croatia, Germany and the Czech Republic.

By contrast, in all CE countries (except Italy and Croatia) rail has a larger share in goods transport, particularly in Slovenia, Slovakia, Austria and Hungary, where around 30% of goods are delivered by rail. Other transport modes, such as waterways and pipelines, have much lower shares, though in some cases they can account for more than 10% of goods transportation (e.g. Slovak pipelines).

Regarding the shift from one goods transport mode to another (right graph in Figure 2.21), the situation in the CE territory is very heterogeneous. Thus, in 2005-2015 some countries saw a large shift towards the road transport of goods, such as the Czech Republic, Poland, Slovakia and Austria, all of which

basically swapped rail for road transport. By contrast, in Germany, Hungary and Slovenia, transport shifted from road to rail; and in Croatia from road to inland waterways.

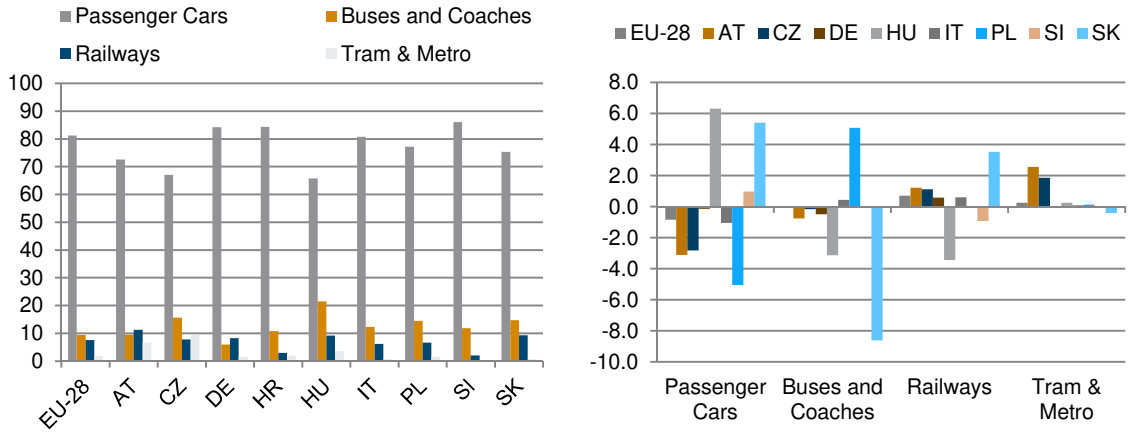
Analysis of CE passenger transport modes reveals some heterogeneity across countries. In Germany, Croatia, Italy and Poland, the importance of car transport is at or above the EU-28 average. In those countries, cars account for more than 80% of all transport (excluding air and sea transport). On the other side, car transport is of less importance in Hungary and the Czech Republic, as well as in Austria. Poland and Slovakia are around the EU average. Still, even in the Czech Republic, Hungary and Austria cars transport two thirds or more of all passengers.

In many (especially Eastern) CE countries, bus and coach transport is more frequent than on average in the EU-28, while rail transport in CE is around the EU average, except for in Slovenia and Croatia.

Regarding the shift in transport modes over time, most CE countries shifted slightly from road to rail transport in the period 2007-2015. Exceptions are Hungary and Slovakia, which saw an increase in car transportation, while in Poland bus and coach transport became more popular. Two countries, Austria and the Czech Republic, also had a visible shift towards public tram and metro transport.

Figure 2.22 / CE passenger transport by mode, in passenger-kilometres

Left graph: mode shares 2015, Right graph: change in shares 2007-2015



Source: DG MOVE, 2017; 2009.

TNC policy options

To reduce oil dependency and GHG emissions, EU policy focuses on a number of objectives, such as a) improving the energy efficiency of vehicles through technical innovations, b) fostering the use of multimodal logistic chains, including especially rail and water transport for freight and public transport for individual transport, and c) using transport infrastructure more efficiently by having improved traffic-management and information systems, as well as advanced logistic and market measures (e.g. integrated European railway market).[78]

[78] EU Commission, 2011a.

Regarding public transport, there is also a special focus on urban transport, as it is responsible for around one quarter of transport CO_2 emissions and for more than two thirds of all road accidents.[79] Introducing and popularising 'clean' urban public transport, as well as promoting walking and cycling within cities, could thus make an important contribution not only to a reduction in general fossil fuel consumption and GHG emissions, but also to lower congestion and noise and to improved air quality.

As the thematic study on 'Sustainable public transport and logistics in the CENTRAL EUROPE Programme' shows,[80] CE projects have been very active in all these areas. For example, the CE 2007-2013 project KASSETTS focused on developing and implementing ICT tools to improve logistics and raise the energy efficiency of transport. The REZIPE project supported the transition from conventionally fuelled to zero-emission vehicles in public administration, by creating policy tools, developing action plans and testing innovative approaches in pilot actions. The Central Meet Bike project aimed to improve and create better conditions for cycling in CE, while INWAPO supported the change to multimodal transport, including waterways and maritime transport. Likewise, the CE 2007-2013 project TROLLEY promoted trolleybuses as a cheap, clean and energy-efficient form of urban public transport. Overall, the vast majority of the CE 2007-2013 transport projects contributed to a more energy-efficient and environmentally sustainable transport system in the CE territory.

This is continued for the current Interreg CE Programme. For example, the project LOW-CARB aims to enhance capacities for integrated low-carbon mobility planning for functional urban areas, SOLEZ supports low transport emission zones or other low-carbon mobility policies, and SULPiTER intends to provide an evidence base to improve policy makers' understanding of freight phenomena in functional urban areas from an energy and environmental perspective. With this, the project aims to enhance policy capacity to develop sustainable urban logistics plans.

2.4.2.3. Safe transport

Description

In 2015, more than 26,000 people died on the roads of the European Union, i.e. the equivalent of a small to medium-sized town. Also in 2015, there were over 1 million road accidents,[81] incurring large economic and social costs[82] and even larger personal tragedies. Almost half of the fatal accidents and around 55% of all accidents occurred in CE countries.

Figure 2.23 shows that road safety is a particular problem in the CE territory, as eight of the nine CE countries have a higher number of road fatalities per million inhabitants than the EU-28 average. The death rate is particularly high in Croatia and Poland, but is also substantial in the Czech Republic and Hungary.

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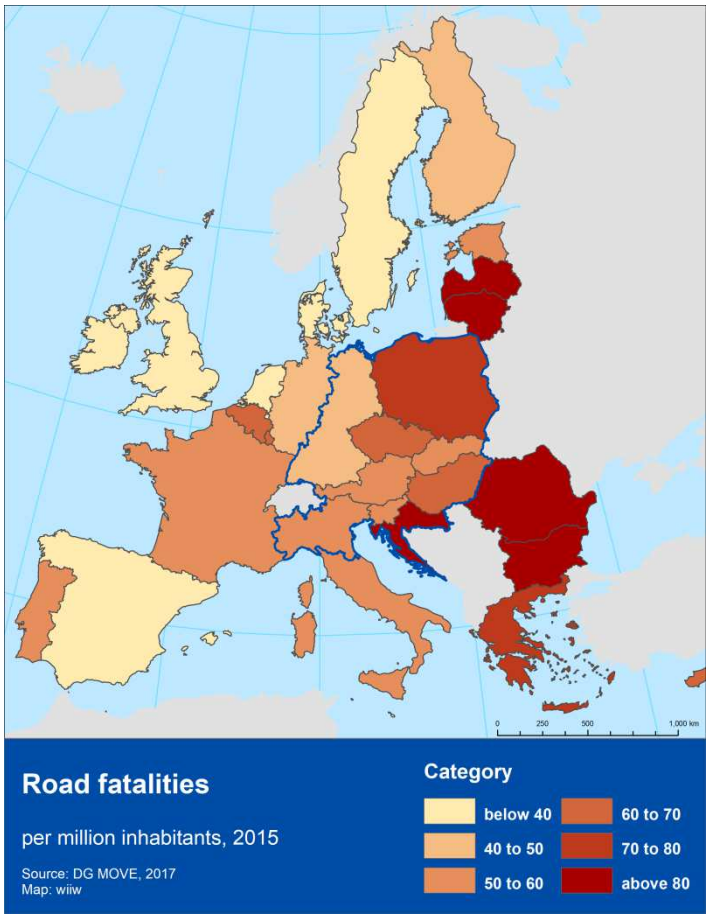
79 EU Commission, 2011a, p.8.

80 Komobile, 2013.

81 DG MOVE, 2017.

82 In 2009, more than 35,000 people died and 1.5 million people were injured on European roads. The societal costs were estimated to be around 160 billion Euro (EU Commission, 2010).

Figure 2.23 / Road fatalities per million inhabitants, 2015



Note: Blue line indicates CE territory
Source: DG MOVE, 2017.

TNC policy options

To improve road safety, European transport policy has set seven strategic objectives, such as a) improving the education and training of road users, b) increasing the enforcement of road rules, c) safer road infrastructure, d) promoting the use of modern technology to increase road safety, and e) improving emergency and post-injuries services. For some of these objectives, the concrete policy actions explicitly envisage the cross-border exchange of information and/or best practice (e.g. for safer road infrastructure or the enforcement of road rules). Thus, there is a 'natural' role for TNC to contribute to transport safety in the CE territory.

However, actual Interreg projects in this area are few. In the current Interreg CE Programme no project yet deals with transport safety, while in the Central Europe 2007-2013 Programme only one out of 21 transport-related projects focused on transport safety, i.e. the Save Our Lives (SOL) project. The main outputs of this project were: a) road safety guidelines for experts and decision makers, b) a manual for road safety campaigns, c) road safety data collection and survey tools, d) train-the-trainer workshops, e) road safety action plans and pilots, and f) a transnational road safety strategy and action plan.[83]

[83] Komobile, 2013.

Reportedly,[84] SOL project partners developed teams, structures and built capacities to continue road safety cooperation on a permanent basis.

Given the importance of the topic, its personal and economic consequences, as well as the potential for TNC in this area, there should be at least discussion of whether transport safety needs more attention in the TNC policy making.

2.4.3. Summary

TNC is an important contributor to the transport challenge, as it provides a platform to engage in joint activities to make transport cleaner and more efficient, as well as to improve the infrastructure and accessibility of the CE territory. Thus the cross-border aspect is of key importance, since it allows topics to be covered that in principle are borderless, such as the environment and GHG emissions, or transport infrastructure in a functional area. With its projects, TNC has also benefited urban areas by promoting clean and sustainable public transport or modal shifts from cars to bikes or other 'greener' forms of transport. Additionally, the CE Programme and its projects have continued to demonstrate that TNC is an effective policy instrument that complements bigger, investment-heavy EU infrastructure programmes.

Therefore – given both the unresolved issues (such as GHG emissions) and the emerging issues (such as the technological changes that lie ahead in the transport sector – e.g. electric cars, self-driving cars, etc.) – it is recommended that transport should remain a focus for future Interreg CE Programmes.

[84] See the project's activities at http://www.central2013.eu

2.5. ENERGY

2.5.1. Energy challenge

The EU goals of 'smart, sustainable and inclusive growth' envisaged in the Europe 2020 strategy[85] require, inter alia, an appropriate energy framework. This framework is also provided by the so-called EU Energy Union package adopted in 2015, which targets the following five closely related and mutually reinforcing dimensions: (i) energy security, (ii) internal energy market, (iii) energy efficiency, (iv) decarbonisation, and (v) research, innovation and competitiveness.[86] The stated aim of the Energy Union is to ensure that European consumers have secure, affordable, competitive and sustainable energy.

Despite the substantial progress in reducing energy intensity achieved over the past decades, the EU is still heavily dependent on imported energy: it imports more than half of the energy it consumes (53.5% in 2014). This dependence will likely continue to grow in future, given that the EU's own production of oil and gas, which is mostly located in the North Sea, is declining; for instance, oil production fell between 2005 and 2014 by almost half. Import dependence is related to issues of energy security, as it makes the EU potentially vulnerable to disruptions in energy supplies; the reasons could be logistical or diplomatic, for instance (although the newly built interconnections and liquefied natural gas terminals have somewhat improved security of the gas supply). High energy consumption is also a factor affecting competitiveness, particularly in energy-intensive industrial branches (such as metals, chemicals, glass or cement production), and may potentially become an issue once global energy prices recover from their currently relatively low levels. Also, within the framework of the Kyoto Protocol and the Paris Agreement on climate change, the EU has committed itself to reducing its GHG emissions caused by using fossil fuels.

Many of these problems arguably apply to CE countries even more than to the EU as a whole. The CE's present energy system is heavily dependent on imported fossil fuels, particularly Russian natural gas, supplied mostly via Ukraine and Belarus. The recurrent business disputes between these three countries (amplified by the Russia–Ukraine geopolitical conflict) have already led to repeated disruptions of gas supplies, most notably during the winter of 2009. Also, the energy intensity of many CE countries tends to be higher than the EU average, although the share of renewables in the energy mix is at a similar level. Many CE countries (with the exception of Austria, Germany and Italy) are vulnerable to peak energy demand, e.g. for cooling during the heatwaves in summer and for heating in extreme winter conditions.[87] In addition, some countries (above all the Czech Republic and Poland) rely heavily on coal – the least 'clean' fossil fuel, with the highest carbon footprint – for electricity generation and show accordingly high levels of GHG emissions per capita.

Within CE, the former communist countries and regions generally show a higher degree of energy dependence and a lower resilience to potential energy-related shocks. For instance, the greatest susceptibility to a shortage in the supply of fossil energy is to be found in Slovakia, Hungary and one

[85] European Commission, 2010d.

[86] European Commission, 2015g.

[87] ÖIR and PAN IGiPZ, 2012.

region of Slovenia (Zahodna Slovenija).[88] Eastern German regions, which used to be part of the German Democratic Republic, are characterised by the highest susceptibility index – a result of inadequate investment in new energy capacities.[89] By contrast, Austria and the regions of northern Italy generally rank highest on both accounts, largely because their energy supplies are more geographically diversified and their use of renewable sources of energy is higher.[90]

To address the above challenges, in 2007 the EU adopted the so-called 'EU climate and energy package'. It set a range of quantitative targets to be reached by 2020 (known as 20/20/20 targets), which were later supplemented by more ambitious targets for 2030, with a view to meeting the EU's long-term 2050 GHG reductions target:[91]

- a 20% share of renewable energy consumption by 2020 and 27% by 2030;
- a 20% cut in GHG emissions by 2020 and a 40% cut by 2030, compared to the 1990 level; and
- at least 20% energy savings by 2020 and 27% by 2030, compared to the so-called business-as-usual scenario, i.e. the projected use of energy without extra energy-saving efforts; unlike the former two, this is a non-binding target.

It has been argued that the development of renewable energy sources and energy-saving investments not only address the challenges of import dependence, energy security and GHG emissions, but also create new sources of income and employment. In addition, the attainment of the GHG emission target is supported by the EU Emissions Trading System (EU ETS), which imposes a cap on the amount of GHG that can be emitted and allows companies to buy and sell emission allowances within this cap. At present, ETS covers around 45% of the EU's GHG emissions.[92]

Generally, the EU is well on track to meet these targets. For instance, in 2016 the EU's GHG emissions were already 23% below the 1990 level – thus exceeding the 20% target set for 2020. However, as can be seen from Figure 2.24, not all CE countries have demonstrated the same progress in reducing GHG emissions. In Slovenia, GHG emissions have declined by only 6%, and in Austria they have even increased since 1990. One important area where the CE territory has been generally lagging behind in this respect is the transport sector. While in the EU-28 GHG emissions in the transport sector have broadly stagnated since 2000, nearly all CE countries (with the exception of Germany and Italy) have recorded marked increases, by up to 66% in the case of Poland.[93]

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88 The index of susceptibility to a shortage in the supply of fossil energy has been calculated on the basis of the following indicators: the share of oil and gas imports, the share of renewables, domestic gas prices, energy intensity and per capita GDP.

89 The energy susceptibility index for insufficient investment in new capacities is based on the following indicators: the share of electricity in energy consumption, the share of wind power in net generation capacity, domestic price of electricity, electricity intensity and per capita GDP.

90 ÖIR and PAN IGiPZ, 2012.

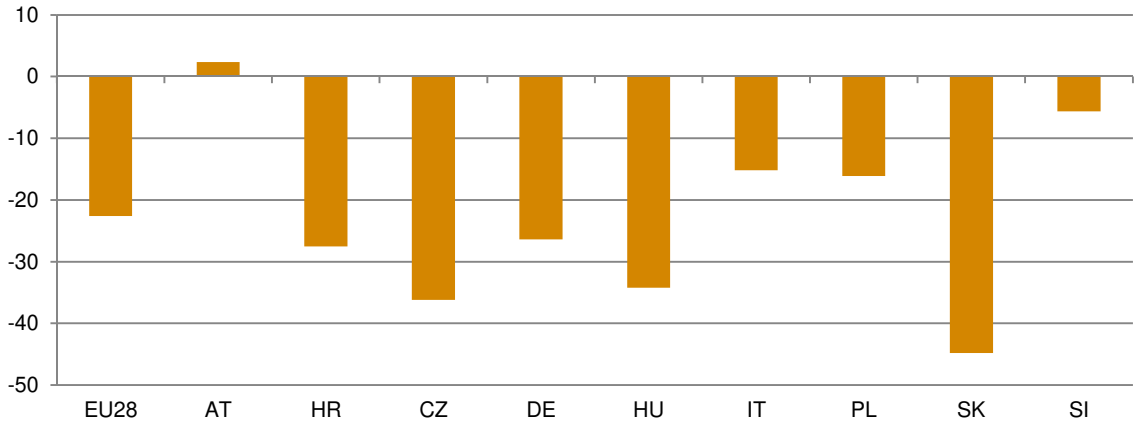
91 https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2030-energy-strategy

92 https://ec.europa.eu/clima/policies/ets_en

93 For more detail, see the section 'Transport and accessibility'.

In general, much more effort will be needed at the EU level to meet the more ambitious 40% target set for 2030. According to projections based on existing measures, GHG emissions in the EU in 2030 will have declined by only 26% from the 1990 level.[94]

Figure 2.24 / Change in GHG emissions in CE and EU-28 during 1990-2016, in %



Source: https://ec.europa.eu/energy/en/atico_countrysheets/scoreboard?dimension=Decarbonisation+of+the+economy&topic=Greenhouse+gas+emissions

The attainment of the Energy Union objectives is supported by the EU cohesion policy, which envisages significant allocations from the European Regional Development Fund and the Cohesion Fund totalling EUR 68.8 billion in 2014-2020, to be supplemented by national public and private co-financing. These funds are earmarked for investments relating to all five Energy Union objectives and are much higher than those allocated under the 2007-2013 EU financial framework. Out of this, EUR 29.1 billion is envisaged for energy and low-carbon research and innovation, and the remainder for directly supporting the move towards an energy-efficient, decarbonised private sector.[95] Under some priorities, the allocations from the cohesion funds require the region to have a Research and Innovation Strategy for Smart Specialisation, which aims at fostering research and innovation.[96]

2.5.2. Energy – policy areas

Apart from specific EU-wide and national policies, a lot of policy making in the energy area is being done at the regional level. One example is the Sustainable Energy Action Plans (SEAPs) of the so-called Covenant of Mayors (CoM) for Climate and Energy. Launched in 2008, the CoM is an initiative by cities and local governments (including outside the EU) that voluntarily commit to contributing to the GHG emissions-reduction objective and undertake activities in order to reach it. The target set by the CoM for 2020 envisages a reduction in GHG emissions of 27% (from the 1990 level); this is 7 p.p. more than the general 20% target set by the EU. However, this commitment is related mainly to emissions associated with energy consumption in sectors that can be influenced by the local authority, such as housing,

94 DG Regio, 2017b.

95 DG Regio, 2017b.

96 CENTRAL EUROPE Programme, 2014.

services and urban transport (thus not industry or transport outside the mandate of the local authority, such as highways).[97] In the CE territory, there are 1,846 regional authorities that have submitted such SEAPs, with the policy instruments typically including regulatory policies, fiscal incentives and direct public financing of energy-efficiency measures and renewable energies.[98] Another example of policies aimed, inter alia, at reducing energy consumption and GHG emissions is the concept of Sustainable Urban Mobility Plans (SUMPs), launched in 2013. The primary goal of SUMPs is to improve the accessibility of urban areas and provide high-quality and sustainable mobility and transport to, through and within the urban area.[99]

To reach the targets outlined in the SEAPs and SUMPs, there is often a need for transnational cooperation. One example of TNC can be found in the Interreg CE cooperation programme, whose aim it is to improve capacities for regional development in innovation, carbon dioxide reduction, the protection of natural and cultural resources, and transport and mobility.

Regional surveys suggest that the perceived benefits of TNC within the framework of the CE Programme in the energy area typically include:[100]

- **mutual learning**, particularly between regions with different development backgrounds (for instance, a region that is just starting to develop its own renewable energy sources may learn a great deal from a region with 30 years of experience);
- **skill synergies** (access to skills which are not available in the region; such skill synergies can be observable even between regions at a similar development level);
- **development of transnational actions**, which allows the exploitation of economies of scale (particularly in view of the often-limited fiscal resources at the regional level);
- **political and social buy-in** (whereby TNC allows the profile of energy issues at stake to be raised).

2.5.2.1. Energy efficiency

Description

Most recent assessments suggest that the EU is well on track to meet its energy-efficiency targets. In 2014, its primary energy consumption was a mere 1.6% above the 2020 target, while final energy consumption was already 2.2% below the target.[101] In absolute terms, energy savings have been helped by the global economic crisis of 2008-2009 and the subsequent protracted economic stagnation in the euro area, both of which suppressed demand for energy. However, Figure 2.25 demonstrates that the energy intensity of GDP has also declined – by 23% since 2000 for the EU as a whole, reflecting improvements in all key sectors: industry, transport, the residential sector and services.

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97 European Commission, 2017.

98 CENTRAL EUROPE Programme, 2014.

99 Annex 'A concept for sustainable urban mobility plans' to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'Together towards competitive and resource-efficient urban mobility', COM(2013) 913 final.

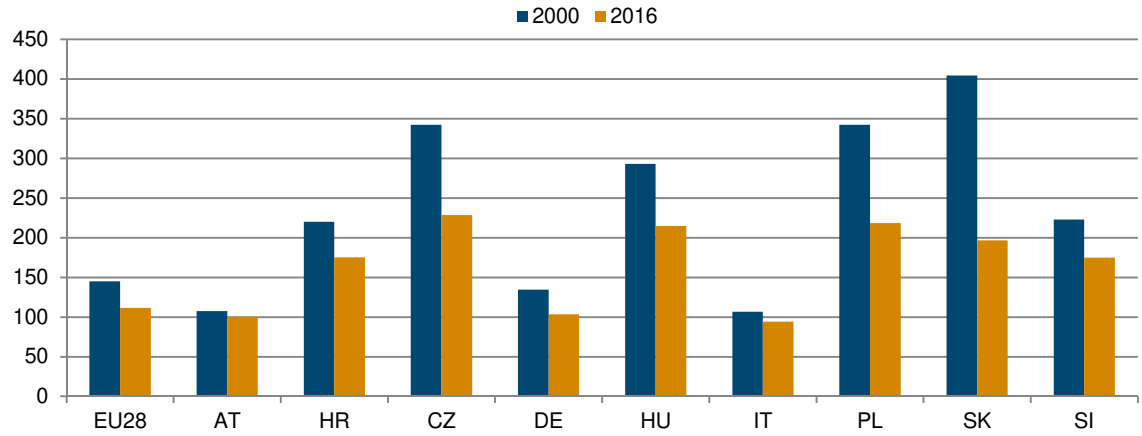
100 CENTRAL EUROPE Programme, 2014.

101 European Commission, 2017.

The improvement in energy efficiency has been visible in every single CE country (Figure 2.25). This applies in particular to the formerly communist CE countries, where the initial levels of energy intensity were much higher, and where structural change and modernisation over the past two decades have been more pronounced than in Western Europe. Nevertheless, their energy-intensity levels (calculated as energy consumption per unit of produced GDP in EUR at constant 2010 prices) are still higher than in Germany or Austria, for instance. This is primarily due to the undervaluation of the currencies of these countries (i.e. their lower price levels), which suppresses the value of their GDP expressed in EUR terms. The 'technological' energy intensity of formerly communist CE countries, which can be calculated by dividing energy consumption by unit of produced GDP at purchasing power parities (instead of exchange rates), is now largely comparable to that of Western Europe.

Figure 2.25 / Energy intensity in CE and EU-28

in tonnes of oil equivalent per million EUR of GDP (at constant 2010 prices)



Source: https://ec.europa.eu/energy/en/atico_countrysheets/datamapper?indicator=EE1&subindicator=EE1-A1

The EU Energy Efficiency Directive[102] requires EU Member States to lead the way on energy efficiency through public procurement, providing incentives to cut energy consumption and conducting regular energy audits of large companies. Also, the Energy Labelling Regulation[103] and the Eco-design Directive[104] are supposed to improve the information available to energy consumers. At the same time, the benefits of energy efficiency must outweigh the cost (for instance, of renovations).

When it comes to energy efficiency, a special emphasis is put on the building sector, which accounts for around 40% of total energy consumption in the EU.[105] In particular, the Energy Performance of Buildings Directive[106] requires Member States to apply energy performance standards to new and existing buildings, with the long-term goal that all new constructions will be 'nearly zero energy buildings' (nZEB)

[102] Directive 2012/27/EU on energy efficiency.

[103] Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU.

[104] Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products.

[105] CENTRAL EUROPE Programme, 2014.

[106] Directive 2010/31/EU of the European Parliament and of the Council of 16 May 2010 on the energy performance of buildings.

by 2021 (2019 for public buildings). In the case of older buildings, measures aimed at reducing energy consumption typically include proper insulation, installation of triple-glazed windows, new ventilation systems, the sealing of gaps to ensure that buildings are air-tight, and use of low-energy appliances. In industry, energy efficiency is promoted, as a starting point, via regular energy audits, with the elaboration of specific recommendations for energy-efficiency measures. In transportation, energy efficiency is promoted by setting explicit targets for the fuel efficiency of vehicles; to a lesser extent, behavioural incentives are also created.

Energy-efficiency projects account for more than half of the EUR 29.1 billion cohesion policy funds earmarked for energy and low-carbon research and innovation; of this, EUR 13.4 billion is accounted for by public and residential buildings, and a further EUR 3.3 billion by enterprises, with a focus on SMEs. Other priority areas of cohesion policy instruments also include an energy-efficiency component.[107]

TNC policy options

Another example of a project involving TNC in the area of energy efficiency is the Interreg CE BOOSTEE project. It aims to improve the governance of energy efficiency in existing public buildings, especially in less-advanced CE regions; it will enable sizeable energy savings to be made without the need for major construction work. To this end, the project has produced the first 3D building models, starting with the available geospatial data collected in the pilot areas; it envisages developing the OnePlace platform, which would transfer knowledge about innovative approaches towards the energy auditing of buildings.

The ENERGY@SCHOOL project aims to reduce energy consumption in public schools; this is the second-highest item of expenditure in municipalities' total running costs.[108] A similar objective is pursued by the TOGETHER project. Its aim is to involve energy users in the management of public buildings and to stimulate political buy-in to energy-efficiency integrated measures on both the supply and the demand side. The outputs envisaged include the elaboration of a training model and of a toolkit combining technical, financial and demand-side management tools, as well as pilot actions involving 85 buildings audited and equipped with smart metering systems for a total of eight pilot investments.[109] Finally, the Dynamic Light project develops dynamic light solutions, with the aim of combining an improved quality of light with energy savings in public space.[110]

Energy efficiency was also the target of several important CE projects within the previous (2007-2013) EU financial framework. Examples of these projects include CEC5 (Demonstration of energy efficiency and utilisation of renewable energy sources through public buildings),[111] GovernEE (good governance in energy efficiency),[112] CombinES (Combining energy services with subsidy schemes to finance energy

[107] European Commission, 2017.

[108] http://www.interreg-central.eu/Content.Node/ENERGYATSCHOOL.html

[109] http://www.interreg-central.eu/Content.Node/TOGETHER.html

[110] http://www.interreg-central.eu/Content.Node/Dynamic-Light.html

[111] http://www.projectcec5.eu/

[112] http://www.governeeproject.eu/

efficiency in Central Europe)[113] and EnSURE (Energy Savings in Urban Quarters through Rehabilitation and New Ways of Energy Supply).[114]

2.5.2.2. Renewable energy

Description

The recent progress with respect to renewables has been impressive in the EU: between 2005 and 2016, the share of renewable energy jumped from 9% to 17% of gross final energy consumption (Figure 2.26). However, unlike the target for (final) energy consumption, the 2020 EU target for renewables (20%) has not yet been met.

Since individual EU Member States have very different starting positions and policies with regard to renewables, they also have very different targets for the share of renewables. These country-specific targets have been defined on the basis of percentage increase in the share of renewables against the 2005 level. Within CE, the share of renewables in gross final energy consumption ranges from 33% in Austria (largely on account of hydropower) to just 12% in Poland (where the bulk of electricity is generated from coal). Figure 2.26 also shows that all countries of the region have shown considerable progress when it comes to increasing the share of renewables, and many of them (Croatia, Czech Republic, Hungary and Italy) have already more than met the 2020 target. However, in Germany, Poland, Slovakia and Slovenia the gap is still substantial. Bridging it may prove challenging, especially since the currently relatively low energy prices make renewables less competitive and investment in renewables less attractive. Also, some CE countries show a very low share of biofuels in the crucially important transport sector: in Slovenia and Croatia, it is below 2%, compared to the EU average of 5%.[115]

Within renewables, biomass is by far the most developed energy source in the CE territory (and in the EU as a whole, for that matter) – see Figure 2.27. In the Czech Republic, Hungary and Poland, around 90% of all renewable energy consumption is accounted for by biomass; in Italy it is only half. National plans expect biomass to make up between 94.2% (Czech Republic) and 54.2% (Italy) of renewable heating sources by 2020.[116] Hydropower is generally much less important, but in a few (largely mountainous) CE countries (such as Austria, Croatia and Slovenia) it accounts for between 30% and 40% of total renewables. Finally, in Germany and Poland, a non-negligible share of renewables comes from wind power, which is due to the exposure of these two countries to the windy conditions of the North Sea and the Baltic Sea.

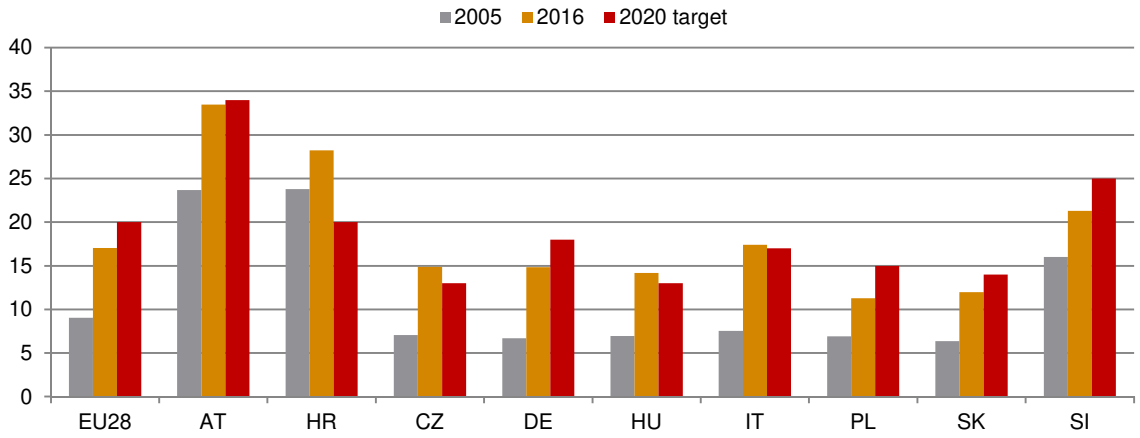
[113] http://www.combines-ce.eu/

[114] http://www.ensure-project.eu/

[115] For more details, please see the section 'Transport and accessibility'.

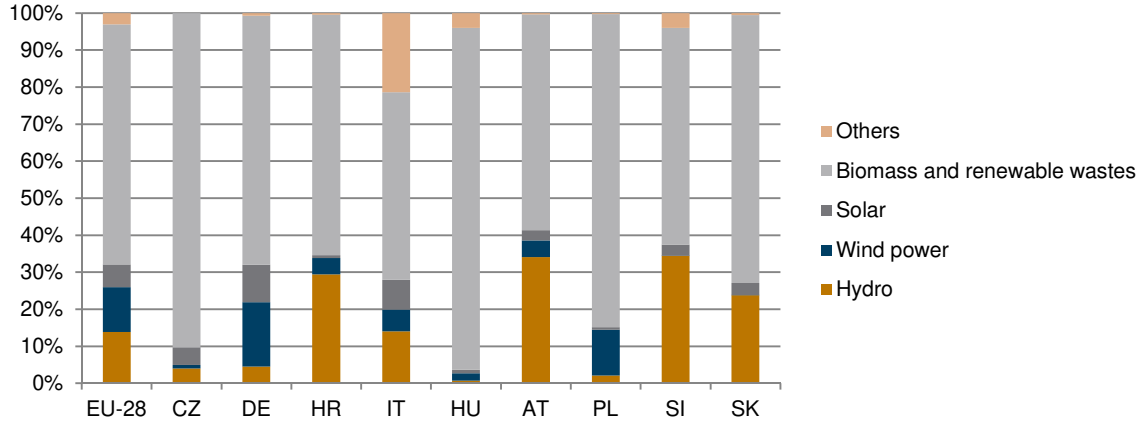
[116] Ecofys, 2013.

Figure 2.26 / Share of renewable energy in gross final energy consumption in CE and EU-28, in %



Source: https://ec.europa.eu/energy/en/atico_countrysheets/factsheets?indicator=DE4&country=EU28

Figure 2.27 / Renewable energy consumption in CE and EU-28 in 2016, by type of renewable, in %



Source: own calculations based on Eurostat data.

The main legislative document aiming at promoting the use of renewables in the EU is the Renewable Energy Directive.[117] Besides, renewables play a role in the EU cohesion policy: funds earmarked for this purpose under the 2014-2020 financial framework total EUR 4.8 billion.[118]

TNC policy options

An example of an Interreg CE project in the field of renewable energy within the 2014-2020 EU financial framework is REEF2W (Increased renewable energy and energy efficiency by integrating, combining

[117] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources.

[118] European Commission, 2017.

and empowering urban wastewater and organic waste management systems). It is aimed at combining and integrating the relevant public infrastructures of municipal solid-waste chains and wastewater treatment plants, and upgrading their input mix and energy outputs.[119] Thus, it tackles the integration and optimisation of wastewater treatment plants and municipal waste management systems. The project aims to make these energy-consuming plants more efficient and self-sustainable, and also to produce a surplus of renewable energy, preferably to be used locally. The energy surplus will improve energy distribution through specific local networks, or serve as an additional energy supply for urban mobility.

Another Interreg CE project in the field of renewables is GeoPLASMA-CE, which aims to improve the share of shallow geothermal energy used in heating and cooling strategies in Central Europe. To this end, the project has set up a web-based interface between geoscientific experts, the public and private stakeholders to make existing know-how about resources and risks associated with geothermal use accessible for territorial energy planning and management strategies. The project reportedly has 11 partners in six countries, and has launched six pilot actions and three e-tools.[120]

The range of Interreg CE projects that targeted renewables was much broader in the previous (2007-2013) EU financial framework than it is now. Several projects specifically targeted the use of biomass, such as 4BIOMASS (Fostering the sustainable usage of renewable energy sources in Central Europe – putting biomass into action),[121] and COACH BioEnergy (Strengthening the energetic use of biomass in Central and Eastern Europe by establishing a standardised transnational consulting net for regions).[122] Other projects in the 2007-2013 financial framework that targeted renewables included, for instance, RUBIRES (Rural biological resources – supporting the use of renewable energy sources and increasing energy efficiency)[123] and TRANSENERGY (Transboundary geothermal energy resources of Slovenia, Austria, Hungary and Slovakia).[124]

The field of renewable energy is also addressed in the Specific Objective 2.2 of the Interreg CE Programme 'To improve territorially based low-carbon energy planning strategies and policies supporting climate change mitigation'. Among the Interreg CE projects in this vein which involve, in one way or another, the promotion of renewable energies are CE-HEAT (which targets increased exploitation of endogenous renewable energy sources – waste heat)[125] and RURES (which seeks to exploit the potential of renewable energies specifically in rural regions).[126] An example of a relevant project from the previous (2007-2013) financial framework is MANERGY, which aimed at paving the way for self-sufficient regional energy supply based on sustainable energy concepts and renewable energy sources.[127]

Another area with substantial scope for TNC in the area of renewable energy is energy grids. In many cases (hydropower, solar energy, wind power), generation capacities are naturally tied to appropriate

[119] http://www.interreg-central.eu/Content.Node/REEF-2W.html.
[120] http://www.interreg-central.eu/Content.Node/GeoPLASMA-CE.html
[121] http://www.4biomass.eu/en/project
[122] http://www.coach-bioenergy.eu/
[123] http://www.rubires.eu/
[124] http://transenergy-eu.geologie.ac.at/
[125] http://www.interreg-central.eu/Content.Node/CE-HEAT.html
[126] http://www.interreg-central.eu/Content.Node/RURES.html
[127] http://www.manergyproject.eu/

geographical conditions. For instance, the CE regions with the highest wind-power potential are located first of all in northern Germany and Poland, and include installations at sea. Conversely, the regions with the highest solar-power potential are typically found in the south of the CE territory, above all in northern Italy. This is not only because these areas typically have more sunny days, but also because their more southerly position increases solar irradiation.[128] This means that energy generation capacities are often located in areas where energy demand is not high enough, so that the energy supply and demand do not match geographically.[129] Another argument for the importance of transnational transmission grids is instability and time variability of electricity generation from renewable sources, which is heavily dependent on the weather.[130] Therefore, the renewables energy industry could potentially benefit hugely from TNC in constructing appropriate transnational energy distribution grids, which ensure reliable and cost-effective power supply.

2.5.3. Summary

The Interreg CE Cooperation Programme explicitly identifies the energy challenge as one of the four main challenges facing CE. Specifically, it aims at developing and implementing territorially based low-carbon strategies in CE by increasing the use of renewable energies and improving energy efficiency, while exploiting the economic growth potential of the low-carbon sector. Within the current (2014-2020) EU financial framework, there are overall 12 projects that in one way or another target the areas of energy efficiency and renewable energies. Of these, seven focus specifically on these two (sub-)challenges, while the remaining five – which target territorially based low-carbon energy planning strategies and policies – also involve issues of energy efficiency and renewable energies. Finally, the Interreg CE Cooperation Programme also includes six projects that address the issue of low-carbon urban mobility, directly relevant to the energy challenge.[131] These projects build on the success of the 19 projects in the areas of energy efficiency and renewable energies within the previous (2007-2013) financial framework.

Our findings suggest that the programme makes active use of the advantages offered by TNC in the implementation of the EU 20/20/20 targets and the Energy Union policies more generally. Among the revealed benefits of TNC in the field of energy is mutual learning, skill synergies, development of transnational actions, and political and social buy-in which can better be achieved at the multi-regional level. The success of various projects within the Interreg CE Cooperation Programme is indirectly confirmed by the progress reached by individual CE countries and regions in reaching the EU 20/20/20 targets, as well as by the progress in meeting the more ambitious 27% GHG emissions cuts target set by the Covenant of Mayors. GHG emissions by the CoM signatories had already declined by 23% by 2014.[132] Still, further efforts will be needed to reach the EU targets set for 2030; in particular, the GHG emissions target appears to be quite ambitious.

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[128] ESPON, 2010.

[129] EEA, 2009. There are already bottlenecks in supplying energy generated in northern Germany to the southern regions, which may intensify in the future unless the existing transmission grids are upgraded accordingly.

[130] EEA, 2009.

[131] These projects are dealt with in the 'Transport and accessibility' section of the present report.

[132] This figure applies to the EU as a whole, rather than just to CE, and results from 315 submitted monitoring inventories covering 25.5 million inhabitants for the period 2012-2014 – see European Commission, 2017.

2.6. CIRCULAR ECONOMY/ENVIRONMENT

2.6.1. Circular economy/environment challenge

An analysis of environmental challenges for the CE territory has already been carried out in earlier studies,[133] but the specific aspect of 'circular economy' is fairly new to this kind of analysis and to EU policy making. Therefore, much of the description is intended to introduce the circular economy concept and background.

The description of the environmental challenge is limited to highlighting that it is human activities that have the most impact on the quality of the environment. Thus, any hope of improving its quality and securing its positive effects on many aspects of human life requires the negative effects of human activities to be limited and policies and actions to be designed to preserve natural assets.[134] As most environmental aspects – such as air quality, biodiversity or water – are by nature cross-border or transnational issues, their preservation should be of common interest across the CE countries. Because of this, transnational cooperation provides an ideal basis for tackling the environmental challenge.

Turning to the circular economy, the consumption and extraction of raw materials is increasing and surpassing what the planet can provide in the long term. Some 6–7 billion middle-class consumers will be on the planet by 2050, putting pressure on consumption and the environment. Overall, our current 'make–use–discard' linear economy – with its too-large use of resources – is unsustainable. Thus, a transition to a circular economy is essential. However, this will require massive changes to production and consumption systems, going well beyond resource efficiency and recycling waste.[135]

On a global level, the UN's Sustainable Development Goals (SDGs) for 2030 are already targeting this challenge – especially Goal 12 'Ensuring sustainable consumption and production patterns'. 'Sustainable consumption and production is about promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all. Sustainable consumption and production aims at "doing more and better with less", increasing net welfare gains from economic activities by reducing resource use, degradation and pollution along the whole lifecycle, while increasing quality of life.' [136]

Pressure to step up efforts towards a circular economy increased abruptly in 2017, when China announced a ban on the import of certain kinds of waste. The new Chinese regulation banning the import of 24 types of waste, including plastics and unsorted paper, came into force on 1 January 2018. Since the 1980s, China had become the world's largest importer of waste, handling over half of all global plastic scrap imports in 2017. According to statistics from the Bureau of International Recycling, China

[133] ÖIR and PAN IGiPZ, 2012.

[134] ÖIR and PAN IGiPZ, 2012.

[135] See interview with Hans Bruyninckx, EEA Executive Director. https://www.eea.europa.eu/articles/circular-economy-in-europe-we-all-have-a-role-to-play?utm_medium=email&utm_campaign=EEA%20Newsletter%20-%20June%202017&utm_content=EEA%20Newsletter%20-%20June%202017+CID_4c59ea3da1e19f520d8f8fb7a8c8c461&utm_source=EEA%20Newsletter&utm_term=Read%20more (Article Published 15 Jun 2017, last modified 22 Mar 2018)

[136] http://www.un.org/sustainabledevelopment/sustainable-consumption-production/

imported 7.3 million metric tonnes of plastic waste in 2016, mainly from Europe, Japan and the United States.[137]

Related EU policies

In December 2015, the European Commission adopted the 'circular economy package'. This included legislative proposals on waste (with long-term targets to reduce landfill and increase recycling and reuse) and an action plan to support the circular economy: 'Closing the loop – An EU action plan for the circular economy'.[138] In this action plan, the circular economy is defined as an economy 'where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste is minimised'.[139]

The proposed actions support the circular economy at each step in the value chain – from production to consumption, repair and remanufacturing, waste management, and secondary raw materials that feed back into the economy. As such, the main areas of action include:

- Production: Targeting better product design and efficient production processes;
- Consumption: Facilitating consumers to support the circular economy;
- Waste management: Finding better ways to collect and manage waste in order to reach high recycling rates and low landfill rates;
- Secondary raw materials and water reuse: Promoting materials that can be recycled to be injected back into the economy;
- Innovation, investment and other horizontal measures: Stimulating the transition to a circular economy.

In addition, certain priority areas have been identified where actions should be concentrated. These include: plastics, food waste, critical raw materials, construction and demolition waste, biomass and bio-based products.

A first report in 2017[140] noted that key actions were being undertaken in areas such as food waste, eco-design, organic fertilisers, guarantees for consumer goods, and innovation and investments. Circular economy principles were gradually being integrated into industrial best practice, green public procurement and new initiatives in the construction and water sectors. It states that the EU action plan has 'undoubtedly contributed to mainstreaming the concept of 'circular economy' as a first step of a long-term endeavour'.[141]

At the beginning of 2018, a circular economy framework was set up, comprising a set of key indicators capturing the main elements of the circular economy.[142] Based on existing data (Resource Efficiency Scoreboard and Raw Materials Scoreboard), a new Eurostat website was created with the main

[137] https://www.globalelr.com/2018/02/chinas-ban-on-waste-imports-upending-global-recycling-market/ (as of 8 February 2018).

[138] European Commission, 2015b.

[139] European Commission, 2015b.

[140] European Commission, 2017c.

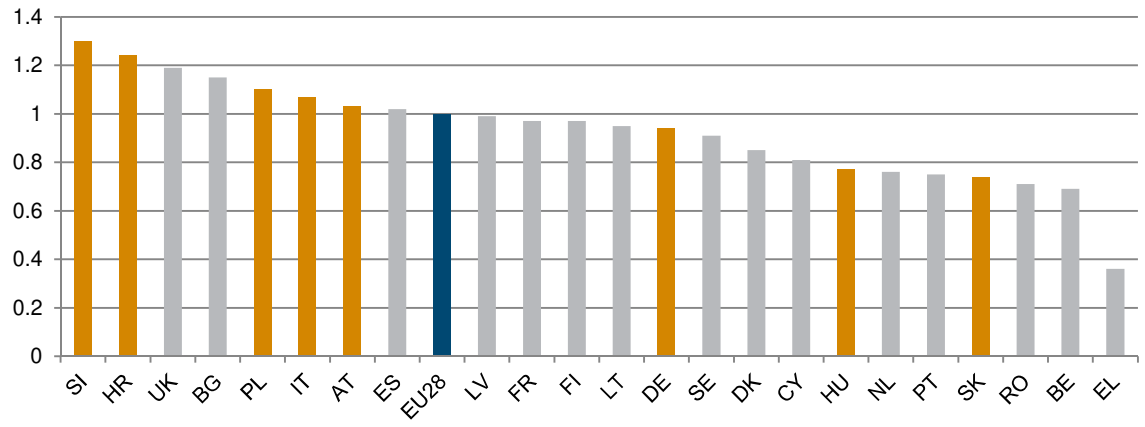
[141] European Commission, 2017c.

[142] European Commission, 2018a, 17 final.

indicators.[143] Besides material flow statistics, the framework mainly follows the circular economy action plan and presents indicators grouped into four stages and aspects of the circular economy: (1) production and consumption, (2) waste management, (3) secondary raw materials and (4) competitiveness and innovation.

Figure 2.28 shows the importance of sectors related to the circular economy, i.e. the recycling and repair sector. It can be seen as a very rough proxy for the circular economy, representing only a subset of the much wider economic impact of the circular economy. In fact, the impact of the circular economy in other sectors is more diffuse and difficult to isolate. In the total economy, the share of the recycling and repair sector ranges from about 1.3% of GDP in Slovenia and Croatia to about 0.4% in Greece. Within CE, whereas Poland, Italy and Austria (about 1% of GDP) also have shares above the EU average, Germany, Hungary and Slovakia lie below (about 0.7% of GDP in the latter country).

Figure 2.28 / Recycling and repair sector, value added as % of GDP, 2015



Notes: Data missing for several countries. NACE classification according to EU Commission, 2018a.
Source: Eurostat.

As the transition to a circular economy is not limited to certain materials or sectors, its change affects the entire economy and involves all products and services; given its cross-cutting nature, policy must target many areas and take a comprehensive approach. Transnational cooperation has an important role to play, facilitating ongoing exchange of experience and strengthening the dissemination of best and novel practice. In the previous CE Programme (2007-2013), there were five transnational projects in the area of 'waste management and resource efficiency', including a wide spectrum of issues such as transboundary informal waste collection and shipment, setting up repair and reuse systems, and improving packaging recyclability and cleaner production. It related to the following EU policies: the EU Waste Directive, the Strategy on the Sustainable Use of Natural Resources and the Roadmap to a Resource Efficient Europe. Projects had a strong focus on businesses and actors involved in waste management. Much of the focus was on capacity building and the dissemination of knowledge to the targeted actors through tools.[144] There was one project under the heading of 'technology transfer and business innovation'.

[143] http://ec.europa.eu/eurostat/web/circular-economy

[144] Regional Environmental Center for Central and Eastern Europe, 2014.

In the current programme period, there are three transnational projects that refer to the circular economy under the heading of 'Culture & environment' and two under the heading of 'Innovation'. EU projects relate to the new EU circular economy package. Allocation of projects is difficult, waste management issues are of importance in all projects and targeted either by businesses or focusing on a special waste stream (e.g. food).

The following policy areas are grouped according to the circular economy action plan and complemented by four broader environmental topics:

1. Production and consumption
2. Waste management
3. Secondary raw materials
4. Eco-Innovation
5. Air quality
6. Biodiversity
7. Soil
8. Water.

2.6.2. Circular Economy/Environment – policy areas

2.6.2.1. Production and consumption

Description

To make a circular economy work, there is a need to be involved right at the beginning of a product's life. Thus, the first stage of the circular economy is at the product level; the next stages are the production processes and consumption.

At the product level, so-called 'eco-design' plays a major role. This is defined as a 'strategic approach that considers the environmental impacts of the full life cycles of products, processes, services, organisation and systems. It delivers products made with fewer resources, using recycled and renewable resources and avoiding hazardous materials, as well as with components that are longer lasting and easier to maintain, repair, upgrade and recycle.'[145] The existing EU Ecodesign Directive[146] targets improvements in the efficiency and environmental performance of energy-related products. As a next step, reparability, durability, upgradability and recyclability or the identification of certain materials or substances will be promoted.

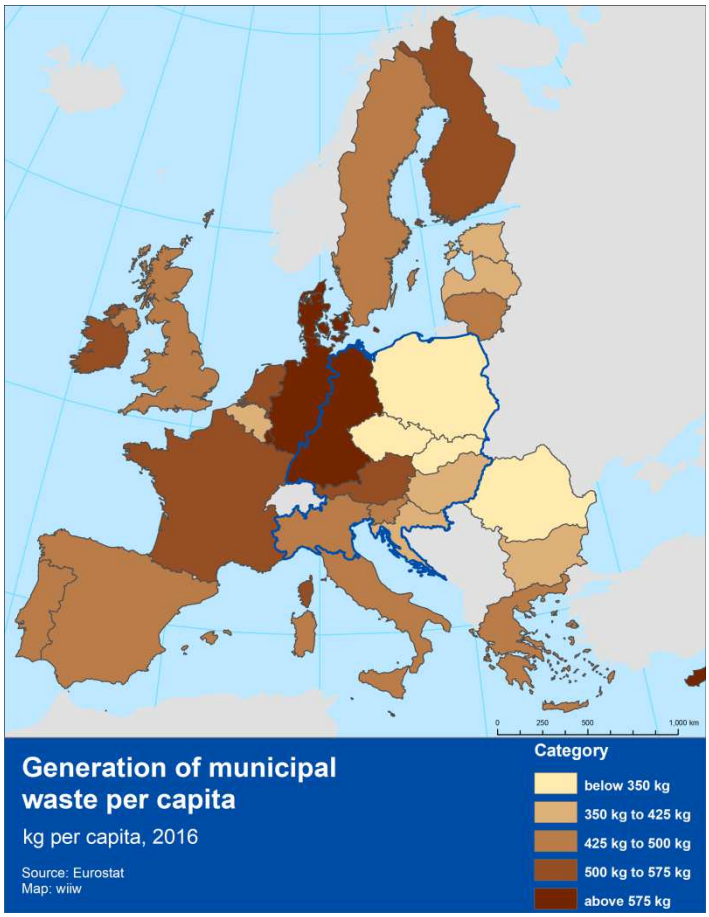
At the next stage, the circular economy targets production processes that minimise material inputs and limit the output of non-recyclable or hazardous waste. To this end, the EU promotes best practice in a number of industrial sectors through Best Available Techniques reference documents (BREFS).

[145] EEA, 2016a, p.18.

[146] Directive 2009/125/EC.

Finally, on the consumption side, the choices made by citizens, governments and businesses should be optimised, as their selection of products and services, patterns of use, disposal options and behaviour strongly affect the transition to the circular economy. The EU targets this area by improving information for consumers on labels, reducing the amount of household waste, or supporting other forms of consumption (e.g. sharing products or infrastructure, consuming services rather than products). In addition, the Commission takes action on green public procurement.

Figure 2.29 / Generation of municipal waste per capita, kg per capita, 2016



Note: Blue line indicates CE territory
Source: Eurostat.

Figure 2.29 shows the generation of municipal waste per capita. In 2016, the amount of waste ranged from close to 800 kg per capita in Denmark to 260 kg in Romania. The amount of waste produced in Germany, Austria and Italy was above the EU average; in other CE countries it was below the average. Slovenia lay close to the EU average with 470 kg, the other countries registered amounts of between 300 and 400 kg of waste per capita.

TNC policy options

Transnational cooperation is of importance and can help with sharing information among various actors, businesses, SMEs or consumers. In the previous CE Programme (2007-2013), two projects targeted

SMEs. The ACT CLEAN project (Access to technology and know-how in cleaner production in Central Europe)[147] supported SMEs throughout Central Europe to implement eco-efficient production processes. It promoted environmental technologies and management systems by connecting demand and supply: it provided SMEs with technological and managerial know-how on the one hand, and facilitated the marketing of already existing solutions on the other. The PRESOURCE project (Promotion of resource efficiency in SMEs in Central Europe)[148] aimed to increase resource efficiency in the CE territory by promoting transnational incentives for eco-innovation. It especially targeted SMEs from the manufacturing sector. In this context, resource efficiency was understood as reducing the use and the costs of energy, material and water in the production process and product life.

The current Interreg CE project CIRCE2020 (Expansion of the circular economy concept in the Central Europe local productive districts)[149] aims to facilitate a larger uptake of the integrated environmental management approach in five specific Central European industrial areas, by changing the patterns from single and sporadic company recycling interventions to an integrated redesign of industrial interactions based on the concept of the circular economy.

2.6.2.2. Waste management

Description

Waste management is the key element in the circular economy. The EU Directive 2008/98/EC on waste (Waste Framework Directive) establishes a waste hierarchy that Member States should apply. It goes from prevention, preparation for reuse, recycling and recovery through to disposal. Countries should take measures to encourage the options that deliver the best overall environmental outcome. The revised EU waste legislation seeks to improve waste management practices, stimulate recycling and innovation in materials management, and limit the use of landfill.

Key elements of the revised waste proposal include:[150]

- A common EU target for recycling 65% of municipal waste by 2030;
- A common EU target for recycling 75% of packaging waste by 2030;
- A binding landfill target to reduce landfill to a maximum of 10% of municipal waste by 2030;
- A ban on landfilling of separately collected waste;
- Promotion of economic instruments to discourage landfilling;
- Simplified and improved definitions and harmonised calculation methods for recycling rates throughout the EU;
- Concrete measures to promote reuse and stimulate industrial symbiosis – turning one industry's by-product into another industry's raw material;
- Economic incentives for producers to put greener products on the market and support recovery and recycling schemes (e.g. for packaging, batteries, electric and electronic equipment, vehicles).

147 http://www.act-clean.eu/

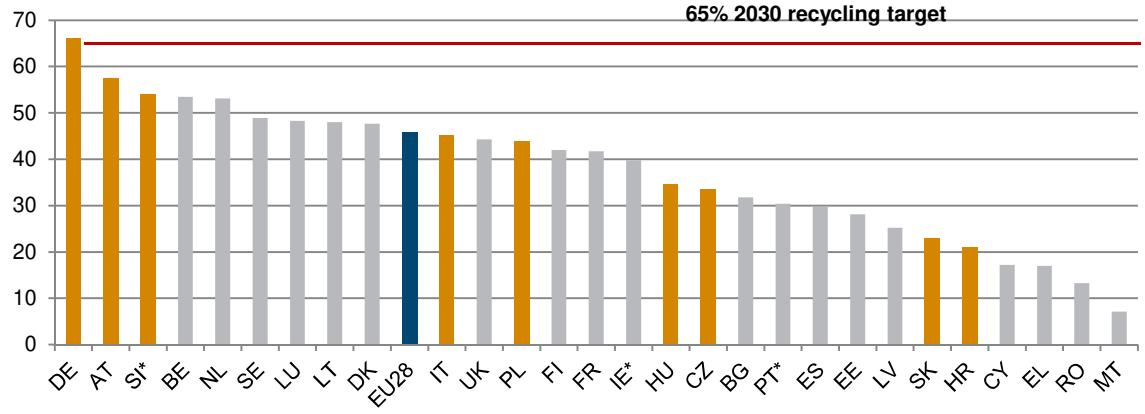
148 http://www.presource.eu/

149 http://www.interreg-central.eu/Content.Node/CIRCE2020.html

150 http://ec.europa.eu/environment/circular-economy/index_en.htm

Figure 2.30 shows the current recycling rate of municipal waste in the European Union. Germany, Austria and Slovenia show the highest rates of 66%, 58% and 54%, respectively (compared with the EU average of 46%). All other CE countries, including Italy, have recycling rates below the EU average. Italy recycled about 45% of its municipal waste in 2016, Poland 44%, Hungary and the Czech Republic about 34%. The lowest rates were recorded in Slovakia (23%) and Croatia (21%). Conversely, the rate of municipal waste going to landfills is still very high in the latter countries. Thus, only Germany has already surpassed the 65% target set in the revised waste legislation. Especially in the CE countries, the gap to be closed is still large.

Figure 2.30 / Recycling rate of municipal waste, 2016



Notes: *Data for Ireland and Portugal for 2014, data for Slovenia for 2015.
Source: Eurostat.

TNC policy options

The recent report on the implementation of the circular economy action plan cites Slovenia as a successful example: it reached its recycling targets with the help of EU funds.[151] The objective of the project 'Upgrading of Regional Waste Management Centre in Ljubljana' was to provide the city of Ljubljana and surrounding municipalities (approximately 414,000 inhabitants) with an integrated, long-term waste management system compliant with national and European legislation.[152] The capital boosted separate collection and recycling and reduced the amount of waste sent to landfill by 59%. It also invested in prevention and reuse, and now generates 41% less waste per capita than the European average.[153]

Transnational cooperation in waste management is essential, so that diverse actors can benefit from knowledge, experience and best practice in other countries of the CE territory. One TNC example is the TransWaste project of the CE 2007-2013 Programme. It sought to gain and provide information about informal waste collection and trans-boundary shipment of waste, as well as to implement possible solutions to environmental, social and economic problems. Another project from this programme is the

[151] European Commission, 2017c.

[152] http://ec.europa.eu/regional_policy/en/projects/slovenia/upgrading-of-regional-waste-management-centre-in-ljubljana

[153] European Commission, 2017c, p.11.

CERREC project (Central Europe repair and reuse centres and networks),[154] which meets the requirements of the Waste Framework Directive (Directive 2008/98/EC on waste) and fosters preparation for reuse as a new form of waste treatment.

The current Interreg CE project STREFOWA (Strategies to reduce food waste in Central Europe)[155] aims to reduce and manage food waste in Central Europe. The participating countries are Austria, the Czech Republic, Italy, Hungary and Poland. The project reports on the current knowledge on food waste amounts in the five selected countries, as well as the quantities of food waste that are prevented by the currently existing best practices in food waste prevention activities/initiatives. Another project SURFACE[156] aims to improve environmental management and the quality of life in functional urban areas through the establishment of multi-stakeholder-based 'smart reuse parks'.

2.6.2.3. Secondary raw materials

Description

In a circular economy, materials that can be recycled should be injected into the economy as 'secondary raw materials', thus transforming waste into new resources and also valorise it. However, the use of these secondary raw materials is difficult, due to uncertainty about their quality, and thus their share in the economy is still low. The EU tries to encourage this process and proposes a range of tools, such as quality standards, common rules on fertilisers, encouraging the reuse of treated wastewater, promoting plastic as a recyclable resource or checking the use of chemicals to fit the circular model. Also facilitating cross-border trade in secondary raw materials falls within this area.[157]

Figure 2.31 depicts the circular material use rate, defined as the ratio of the amount of secondary raw materials to overall material consumption. The highest rate in 2014 was reached in the Netherlands, with 27%, followed by Italy with 19%. Poland, with a rate of 13%, was above the EU-28 average, but all other CE countries were below the average. Germany showed a rate of 11%, Austria of 9%, Slovenia of 8% and the Czech Republic of 7%. Hungary, Slovakia and Croatia were at the lower end, with a rate of approximately 5%.

TNC policy options

Transnational cooperation can play an essential role in the area of secondary raw materials. In the previous CE Programme (2007-2013), the EcoPaperLoop project (Eco-design for the enhancement of Central Europe paper-based products recycling loop)[158] aimed to bring greater awareness in the private and public sectors about recyclability issues. It strove to build a shared, collective knowledge base and focused on the improvement in paper waste management. The project aimed to establish new capabilities for the diffusion and application of paper recyclability assessment and to foster innovation through the introduction of better solutions for the recyclability of paper products.

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154 http://www.cerrec.eu

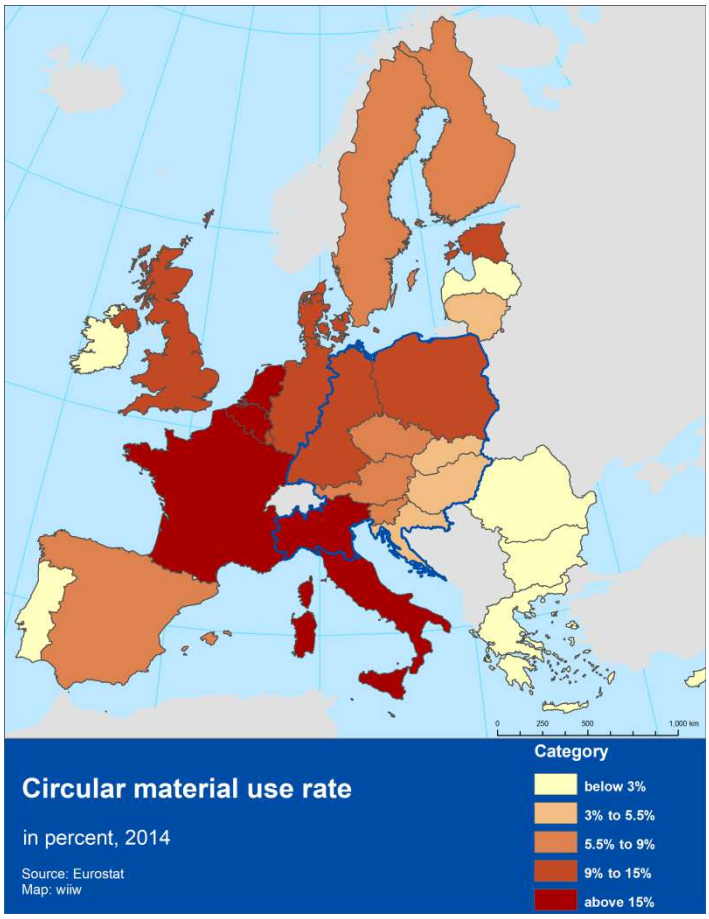
155 http://www.interreg-central.eu/Content.Node/STREFOWA.html

156 http://www.interreg-central.eu/Content.Node/SURFACE.html

157 Factsheet: Closing the Loop: From waste to resources. http://ec.europa.eu/environment/circular-economy/index_en.htm

158 http://www.ecopaperloop.eu/

Figure 2.31 / Circular material use rate, in %, 2014



Note: Blue line indicates CE territory
Source: Eurostat.

2.6.2.4. Eco-Innovation

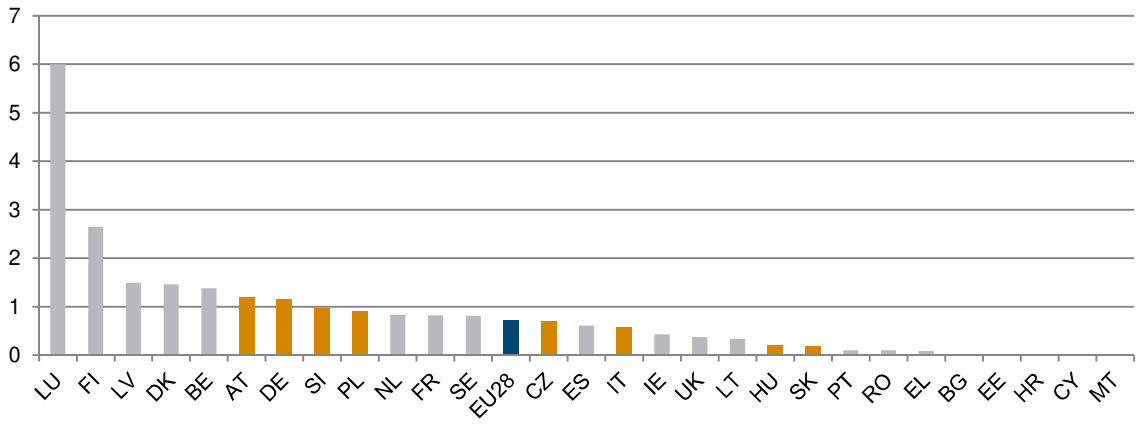
Description

The transition to the circular economy needs further innovation and investment. To this end, the EU provides funding through various channels, including the Horizon 2020 programme (Industry 2020 in the circular economy), cohesion policy funding, LIFE and COSME. Funding, support and development of projects and investment platforms relevant to the circular economy can be sought from the European Fund for Strategic Investment, the European Investment Bank and the European Investment Advisory Hub.

Figure 2.32 shows the number of patents related to the circular economy, i.e. recycling and secondary raw materials, per million inhabitants in individual EU Member States. Luxembourg ranked highest on this account in 2013, which may be because of legal reasons. Within the CE territory, Austria, Germany, Slovenia and Poland were above the EU average, while the other CE countries were below, and no patents at all were registered in Croatia.

Figure 2.32 / Patents related to recycling and secondary raw materials

per million inhabitants, 2013



Source: Eurostat.

TNC policy options

Transnational cooperation can provide an important impetus to the transfer and exchange of technology and can facilitate the transition to a circular economy. In the previous CE Programme (2007-2013), within the thematic topic of 'technology transfer and business innovation', the project PLASTiCE (Bioplastic opportunities for Central Europe)[159] focused on the identification and removal of barriers to the faster and more widespread use of sustainable types of plastics, particularly biodegradable plastics and plastics based on renewable resources. It promoted new environmentally friendly, sustainable plastic solutions through the complete value chain.

There are currently two Interreg CE projects focusing on circular economy issues. The objective of the BIOCOMPACK-CE project[160] is to provide stronger linkages between R&D institutions and companies in the area of paper–plastics packaging solutions, with the aim of introducing verified biodegradable materials in paper and cardboard packaging. The project envisages an innovative cross-sectoral approach and the involvement of clusters, branch organisations and stakeholders that will allow a focus on regional economic specialisations and the speeding up of technology transfer. The ENTeR project[161] focuses on waste reduction to prevent depletion of non-renewable resources in the textile industry. It will strengthen the innovation capacity of textile companies in Central Europe, improve sustainable links among industrial textile areas and foster closer cooperation on waste management and the circular economy.

[159] http://www.plastice.org/home/

[160] http://www.interreg-central.eu/Content.Node/BIOCOMPACK-CE.html

[161] http://www.interreg-central.eu/Content.Node/3.html

2.6.2.5. Air quality

Description

Although air pollution in Europe has decreased substantially over the past few decades, air pollutant concentrations are still too high, and air quality problems persist. Also, the majority of the EU's population lives in urban areas, where pollution with ozone, nitrogen dioxide and particulate matter (PM) poses serious health risks. By nature, air pollution is a transnational issue, as the pollution created in one country can easily result in poor air quality elsewhere. The main sources of air pollution are: a) the burning of fossil fuels in electricity generation, transport, industry and households, b) industrial processes, c) agriculture and d) waste treatment.[162]

To tackle air pollution, in 2013 the EU Commission adopted the Clean Air Policy Package. It includes a) national emission ceilings and reduction commitments for 2020 and 2030, b) a directive on medium combustion plants, to limit emissions of nitrogen oxides, sulphur dioxide and PM and c) additional actions focusing on air quality in cities.

The challenge of air pollution is illustrated by a map of the annual average particulate matter concentration in 2015 (Figure 2.33). It shows that CE is the region that is most heavily affected by PM pollution in Europe. This refers especially to Poland, where the highest concentration values were measured, but also to northern Italy, Slovenia and parts of Hungary (e.g. Budapest) and Slovakia (e.g. Košice).

TNC policy options

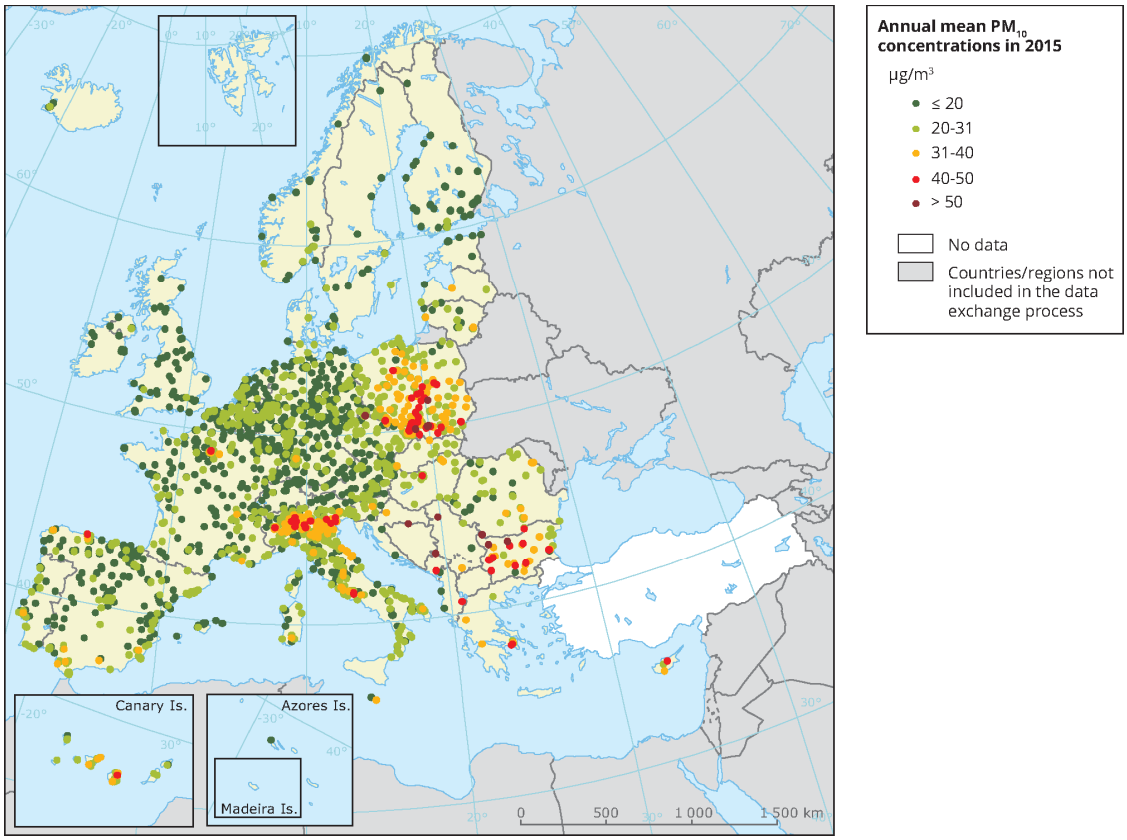
TNC is an ideal platform to tackle air pollution, which is not limited by national borders. Thus, the CE 2007-13 Programme has supported adaptation actions to reduce the adverse health impacts of air pollution (Take a Breath!, TAB project), has promoted environmentally friendly technologies and activities to ensure eco-efficient production processes and products (ACT CLEAN project) and has encouraged better cooperation between environmental and healthcare authorities and regional policy makers to protect local populations from exposure to ultrafine particles (UFIREG project).[163]

Current Interreg CE projects focus on a) the health impacts of indoor air quality (InAirQ), b) improving the environmental management capacity in CE through the promotion and adoption of policy measures and strategies (AWAIR) and c) increasing the air quality management capacities of public sector bodies through the development of a unified spatial information database, introducing new management and pollution prediction tools and air quality strategies (AIR TRITIA).

[162] European Environment Agency, https://www.eea.europa.eu/themes/air/intro

[163] http://www.ufireg-central.eu/

Figure 2.33 / Annual average particulate matter concentration, 2015



Source: European Environment Agency.

2.6.2.6. Biodiversity

Description

Biodiversity is a synonym for the variety of ecosystems, species and genes in a particular habitat. It is an important factor in human well-being, delivering services such as climate regulation, flood protection, soil fertility and the production of food, fuel, fibre and medicines that benefit societies and economies. At the same time, Europe is witnessing a continuous loss of biodiversity, because of agriculture, urban land take, pollution, overexploitation of natural resources and climate change.

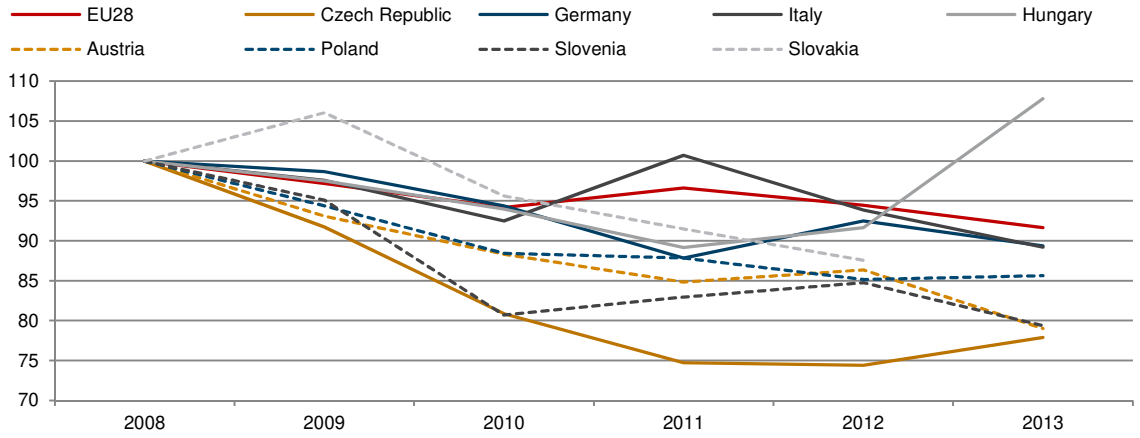
Like air pollution, biodiversity is by nature a transnational issue, as ecosystems (as well as the factors affecting it) do not stop at national borders. Thus, preserving it could also be considered a task for TNC. It could link up with the EU Biodiversity Strategy to 2020[164] and its six targets: a) nature, b) ecosystems and their restoration, c) sustainable agriculture and forestry, d) sustainable fishing, e) the problem of alien species and f) the EU's global impacts.

The status of biodiversity is illustrated by the 'common farmland bird index' (see Figure 2.34). It integrates the population abundance and the diversity of a selection of common bird species associated

[164] EU Commission, 2011c.

with specific habitats. Although this indicator has a narrow focus compared to EU policy objectives on biodiversity and ecosystem services, it is considered to be the best available dataset, and also indicative of general environmental status.[165]

Figure 2.34 / Common farmland bird index, 2008 = 100



Source: Eurostat.

According to this index, all CE countries, except Hungary, saw a drop in biodiversity from 2008 to 2013.[166] This drop was particularly pronounced in the Czech Republic, Slovenia and Austria, where the index dropped by around 20%. Notably, all CE countries except Hungary had a higher loss in biodiversity than the EU-28 on average, thus making it a particular CE problem that potentially can be tackled with TNC.

TNC policy options

Biodiversity has many different aspects that could potentially be covered by policy. Because of this, TNC is advised to take an eclectic approach to project proposals, as there are many ways of preserving biodiversity. This is illustrated by a couple of CE 2007-2013 project examples, such as HABIT-CHANGE, which aimed at evaluating, enhancing and adapting existing management and conservation strategies in protected sites to proactively respond to climate-change threats to habitat integrity and diversity. SALVERE focused on semi-natural grassland as a source of biodiversity improvement, and TransEcoNet on the development, management and protection of transnational ecological networks in CE. Alternatively, the current Interreg CE project 3Lynx aims at improving lynx conservation capacities in CE. The Interreg CE projects MAGIC LANDSCAPES promotes the Green Infrastructure[167] concept and elaborates strategies and tools for protecting and further developing the existing Green Infrastructure in

[165] http://ec.europa.eu/eurostat/web/products-datasets/-/tsdnr100&lang=en

[166] Latest available data.

[167] Green Infrastructure is 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 and functions such as water purification, air quality, space for recreation and climate mitigation and adaptation. This network of green (land) and blue (water) spaces can improve environmental conditions and therefore citizens' health and quality of life. It also supports a green economy, creates job opportunities and enhances biodiversity. (Source: https://www.interreg-central.eu/Content.Node/What-is-Green-Infrastructure-.html)

Central European regions. In addition, SUSTREE intends to identify endangered forest genetic diversity and organise cross-boundary seed transfer. Its goal is to ensure the use of the genetic material fit for climate change in the forests of the region. Finally, the Interreg CE UGB (Urban Green Belts) project will develop integrated models for managing urban green spaces smartly. The models will be tested through pilot actions and compiled to a guide on reforming green spaces management. These projects give a glimpse of the potential range of biodiversity related projects that could be conducted with TNC policy.

2.6.2.7. Soil

Description

Soil accounts for 90% of all food, feed, fibre and fuel production, provides raw materials, purifies and regulates water, and provides a reservoir for genes and species – to list just some its most important features affecting human well-being. Despite its importance, it is under constant pressure from soil sealing, erosion, and decline in organic matter and contamination, all of which reduce soil resilience.

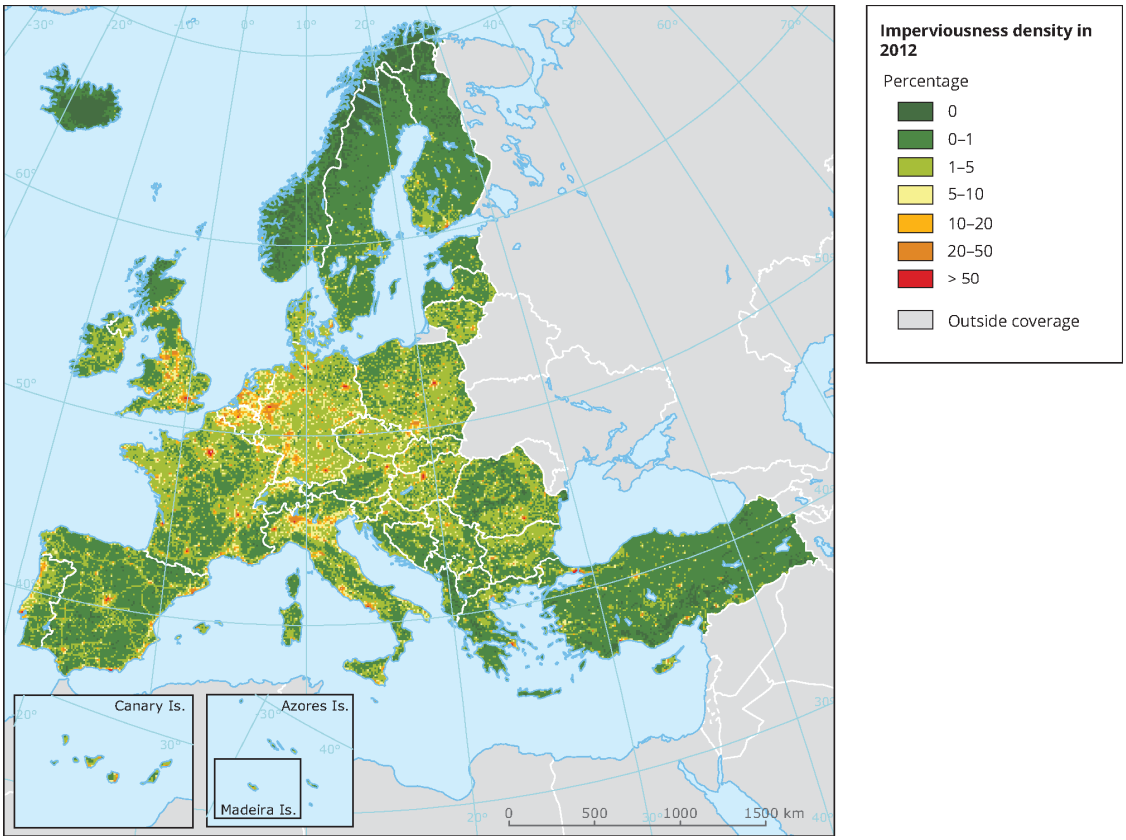
Looking at EU policies,[168] the Commission adopted a Soil Thematic Strategy with the objective to protect soils across the EU in 2006. In May 2014, the Commission decided to withdraw the proposal for a Soil Framework Directive. The 7th Environment Action Programme to 2020, however, which entered into force on 17 January 2014, makes multiple references to the protection of soil and recognises that soil degradation is a serious challenge. It seeks to have policies in place by 2020 to achieve 'no net land take' by 2050 and has also set targets for reducing soil erosion and the loss of soil organic matter. Currently, for example, six EU countries have set quantitative objectives for land take (including Germany and Austria). In Bulgaria, the Czech Republic, Slovakia, Poland and one region in Italy the conversion of agricultural land requires a fee.[169]

Figure 2.35 shows the density of soil sealing in 2012. Green and light-orange colours indicate areas with no or very limited sealing; red and dark-red colours indicate highly to fully sealed grid cells (mainly urban areas). It can be seen that soil sealing is mostly an urban problem both within and outside the CE territory. However, it can have strong effects, especially in combination with climate change-induced extreme weather events, such as floods and heatwaves.

[168] http://ec.europa.eu/environment/soil/index_en.htm

[169] See European Commission (2016), http://ec.europa.eu/environment/integration/research/newsalert/pdf/no_net_land_take_by_2050_FB14_en.pdf

Figure 2.35 / Soil sealing in Europe, 2012



Source: European Environment Agency.

TNC policy options

Since this is a problem common to many CE cities, TNC could be a valuable instrument in tackling urban soil-sealing problems. It allows the pooling of resources, which could benefit smaller or financially weaker cities, the exchange of best practice and knowledge, the development of joint strategies and technical tools, and the coordination of different pilot actions to test the implementation of new methods.

Under the previous CE Interreg 2007-13 programming period, the topic of land management including brownfield management, has been targeted under the heading of 'soil protection and land use' and has been an important topic. It included 5 projects: The URBAN SMS – Urban Soil Management Strategy - project aimed at developing and establishing a comprehensive soil management strategy for CE municipalities to conserve or improve the environmental conditions in urban areas. The UrbSpace project[170] addressed the issue of the improvement of environmental quality in smaller urban centres. The project sought to address the issue of urban planning by focussing specifically on urban landscapes and open spaces in small towns. The CORBRAMAN project dealt with the revitalisation of brownfield sites in order to combat urban sprawl, contributed to improve urban environmental quality and addressed urban segregation and competitiveness issues by providing knowledge to assist with site-revitalisation efforts. The project trained and certified brownfield managers. The ReSource project aimed to address

[170] http://urbanspace.rec.org/

environmental, economic and social problems caused by mining and min closure. The CircUse project[171] aimed to limit the environmental impact of development by limiting urban sprawl. It developed a concept of land-use planning that re-uses previously developed land, referred to as circular land use.

In the current Interreg CE Programme the following projects are related to this topic: The GreenerSites project[172] seeks to improve the environmental management of un- or underused industrial areas. The LUMAT project[173] aims is to implement sustainable land use and integrated environmental management pilot projects in 7 Central European Functional Urban Areas (FUAs).

2.6.2.8. Water

Description

Water is one of the most important resources on earth, and water ecosystems have many vital functions, such as filtering, diluting and storing water, preventing floods, maintaining the climate balance and safeguarding biological diversity. Additionally, water ecosystems provide the means of transport and trade, recreation as well as water supply.

Hence, there are numerous ways in which water affects human life. Correspondingly, protecting these benefits requires an equally broad policy approach. Given the importance of water, its protection is also at the focus of EU environmental policies and is expressed in a number of directives, such as the Water Framework Directive, the Urban Waste Water Directive, the Bathing Water Directive, the Nitrates Directive and the Drinking Water Directive.

Transnational policy making and TNC are highly complementary to EU-level policies, especially since in many cases water-related challenges are not bound by country borders. To illustrate this, the analysis focuses on one main water-related aspect, i.e. freshwater resources. Europe's freshwater resources are under increasing pressure from land use, water abstraction and climate change, which can alter the natural flow regimes of water bodies as well as water quality. In addition, in some areas water use often exceeds water availability, resulting in water stress.

This water stress is illustrated by the water exploitation index plus (WEI+),[174] which assesses the total freshwater used as a percentage of the total renewable freshwater resources available. It is thus an indicator of the pressure or stress on freshwater resources. A WEI+ of above 20% implies that a water unit is under stress, while a WEI+ of over 40% indicates severe stress and clearly unsustainable resource use. The WEI+ for Europe is shown in Figure 2.36, which illustrates that water-related challenges are mostly independent of country borders.

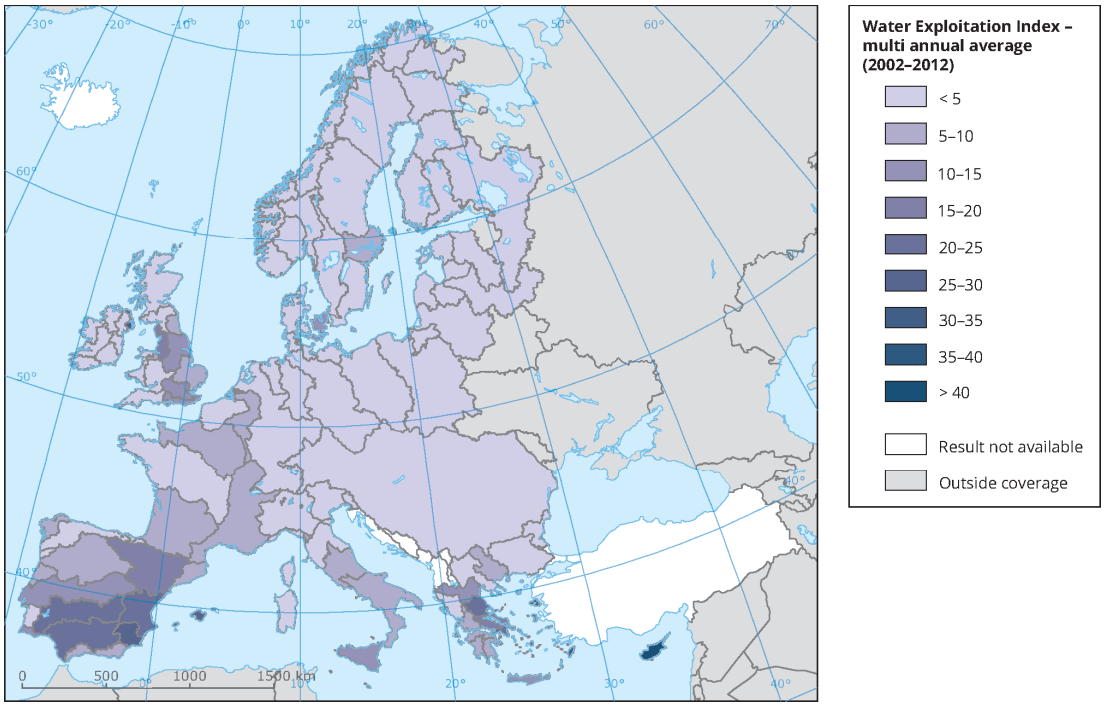
[171] http://www.circuse.eu/index.php?s=1

[172] http://www.interreg-central.eu/Content.Node/GreenerSites.html

[173] http://www.interreg-central.eu/Content.Node/LUMAT.html

[174] https://www.eea.europa.eu/highlights/world-water-day-is-europe

Figure 2.36 / Water exploitation index plus (average 2002-2012)



Source: European Environment Agency.

Compared with other parts of the world, water scarcity in Europe is generally not considered to be a severe challenge[175]. Overall, water is relatively abundant, with on average only 5% of renewable freshwater resources abstracted each year. Within Europe, the CE countries are among the countries with the richest water resources. Nevertheless, particularly the southern areas of Europe, as well as some densely populated river basins, e.g. in France and the UK, have high WEI+ values. This is also affected by natural water availability, which is mainly driven by climatic conditions and variability.[176]

TNC policy options

Like biodiversity, the use of water and its protection have many different dimensions. Therefore, to tackle water-related challenges, TNC has to take an equally wide approach, which it actually has done in the past. This is illustrated by a large number of CE 2007-2013 projects, such as a) URBAN_WFTP, which introduced a water footprint (WFTP) approach in urban areas to monitor, evaluate and improve water use, b) REURIS, which revitalised urban river spaces, c) LABEL, which focused on the adaptation to flood risk in the Labe-Elbe river basin, d) CEframe, creating a Central European flood risk assessment and management in Centrope, e) EULAKES, supporting the sustainable management of Central European lakes, f) INARMA, providing an integrated approach to flood risk management and g) FOKS, which developed new tools for groundwater contamination assessment.

[175] See also the section on 'Water scarcity' discussed within the climate change chapter.

[176] https://www.eea.europa.eu/data-and-maps/indicators/use-of-freshwater-resources-2/assessment-2

In the current Interreg Central Europe programme, the AMIIGA project.[177] pulls 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. The PROLINE-CE project[178] aims at improving the protection of drinking water resources protection measures against floods and droughts in an integrated land management approach.

2.6.3. Summary

The circular economy concept is rather new. However, a transition from a linear 'make–use–discard' economy to a circular economy is indispensable on account of resource constraints and increasing world population and consumption patterns. Policies fostering the circular economy are therefore important. The pervasive nature of the circular economy challenge makes a comprehensive approach necessary.

Transnational cooperation can facilitate information exchange and provide best practices to address the challenge of environment/circular economy. There is also the option to test new approaches. Additionally, many of the environmental and circular economy-related issues are 'borderless' and thus are best solved on a co-operative basis. A direct comparison of the number of projects of the two programming periods is still not possible. However, given the importance of the challenge, it is recommended that environment and circular economy in combination with climate change should remain a focus, potentially a dedicated priority axis, in future CE Programmes.

[177] http://www.interreg-central.eu/Content.Node/AMIIGA.html

[178] http://www.interreg-central.eu/Content.Node/PROLINE-CE.html

2.7. CLIMATE CHANGE

2.7.1. Climate change challenge

Over the last 100 years, the global average surface temperature has increased by 0.74 °C, and the sea level rose by 17 cm during the twentieth century. These and other data deliver sufficient evidence that GHG emissions from human activity are causing climate change. The impact of climate change is asymmetric across European regions, depending on the exposure and sensitivity of ecological and socio-economic systems and the ability of societies to adapt to the changes.[179]

Vulnerability to climate change varies widely from region to region in the EU. According to the European Environment Agency,[180] Italy, Spain and southern and central France are likely to have the highest number of areas adversely affected, along with parts of Southeast Europe. But climate change is also expected to increase the occurrence of natural hazards throughout the EU in the coming decades and will progressively extend northwards to Central Europe in the coming decades.[181]

Climate change is a global phenomenon with global challenges. These emerge in the following dimensions:

- Water
- Food
- Land
- Infrastructure
- Ecosystems and biodiversity
- Extreme weather events.

Vulnerabilities according to the biogeographical regions of Europe are fairly different. South-eastern and southern Europe are projected to be hotspot regions, having the highest numbers of severely affected sectors and domains. Coastal areas and floodplains in the western parts of Europe are also multi-sectoral hotspots. The Alps and the Iberian Peninsula are additional hotspots for ecosystems and their services. Ecosystems and human activities in the Arctic will be strongly affected as well, owing to the particularly rapid increase in air and sea temperatures and the associated melting of land and sea ice. The continental region, where most of the political-geographic region of Central Europe belongs, is less severely impacted, but nonetheless will have to face the following main challenges:

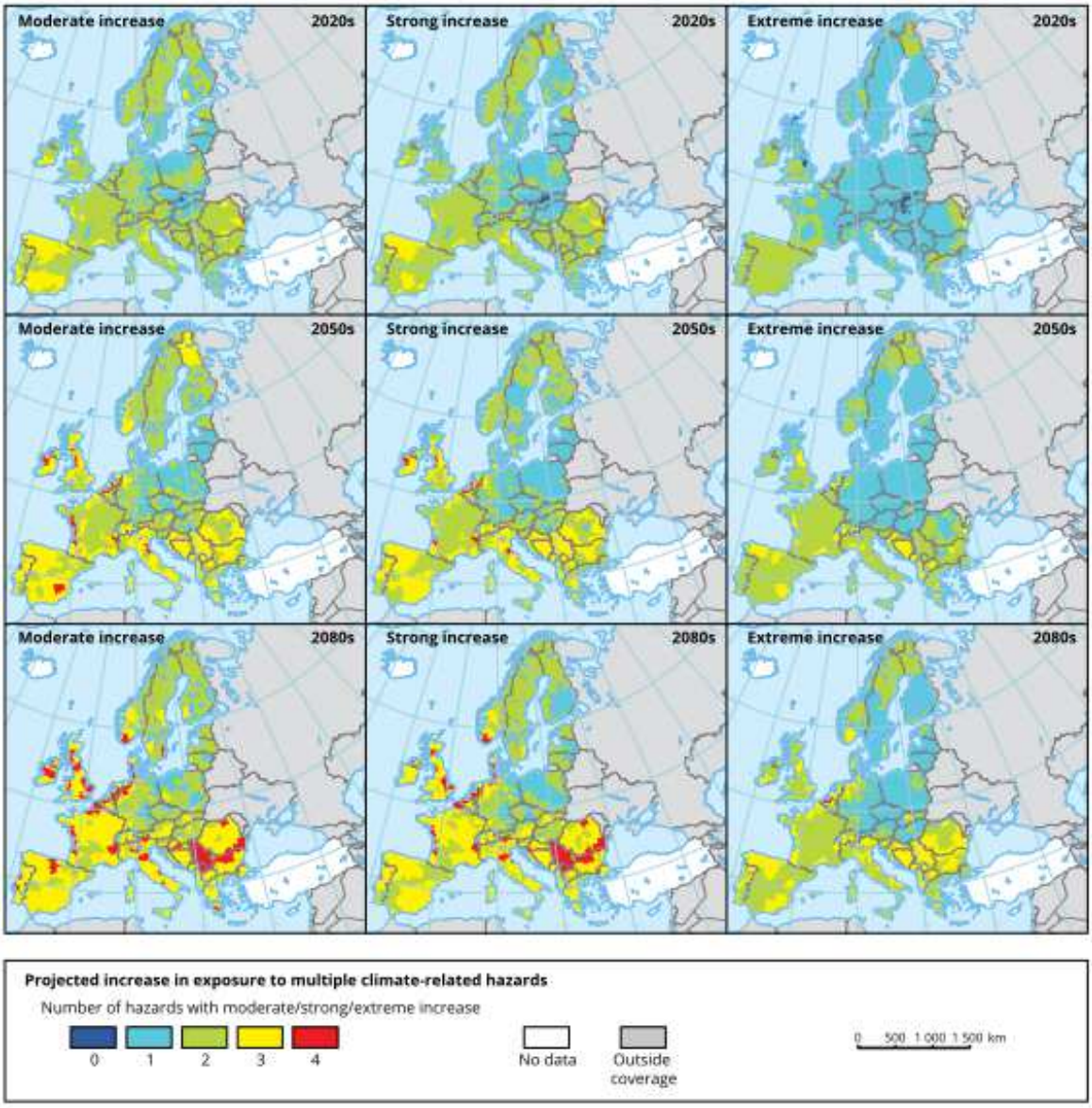
- Increase in heat extremes
- Decrease in summer precipitation
- Increasing risk of river floods and water scarcity
- Increasing risk of forest fires and decrease in economic values of forests
- Increase in energy demand for cooling.

[179] EU Commission, 2009b, p. 3.

[180] EEA, 2017, p. 15.

[181] EU Commission, 2017c, p. 102.

Figure 2.37 / Projected increase in multi-hazard exposure



Note: The maps show projected increases in hazard exposure (considering climatic events with a statistical return interval of 100 years) for three time slices (2020s, 2050s and 2080s) and for three levels: moderate (increases at least 20%), strong (increases at least 100%) and extreme (increases at least 1,000%).
Source: Adapted from Forzieri et al., 2016.

Research analysing multiple climate-related hazards has found that Europe will have to cope with a progressive increase in overall climate-related hazards from the 2020s to the 2050s, and further to the 2080s, with a prominent spatial gradient from north-eastern towards south-western Europe (see Figure 2.37). Key hotspot areas of particular concern (i.e. with exposure to three or four hazards) are found along the coasts and in floodplains. By 2080, most areas in Spain, France, Italy, the Balkan countries, Bulgaria and Romania, but also in the Netherlands, the United Kingdom and Ireland, are projected to be affected by increases in the probability of hazard occurrence. The patterns found point to the critical role of south-eastern and southern Europe as hotspots of climate change impacts and

vulnerabilities. The results also highlight the risk that in the coming decades multiple climate-related hazards will extend northwards to Central Europe (and to Western Europe, too).[182]

A study analysing the specific Central European challenges found that the most significant natural hazards observed in the Central European region in terms of scale and impact are river floods, caused by excessive precipitation and temperature rise, as well as by inappropriate and careless land use. The authors also observed that the EU Member States (and their regions) that joined the EU in 2004 are generally more vulnerable to natural hazards, due to their relatively weak adaptive capacity.

The Energy Union is one of the EU's top policy priorities. Action on climate change to decarbonise the economy is one of the five dimensions of the Energy Union. As part of this, targets have been set for reducing GHG emissions progressively up to 2050.

The elaboration of adaptation strategies has been under way for years. The most long-term policy targets, up to 2050, were set in the Seventh Environment Action Programme (EAP) 'Living well, within the limits of our planet'.[183] Envisioned is a low-carbon society, a green, circular economy and resilient ecosystems as the basis for citizens' well-being. Achieving this 2050 vision requires a focus on actions in three key areas:

› protecting the natural capital that supports economic prosperity and human well-being;

› stimulating resource-efficient, low-carbon economic and social development; and

› safeguarding people from environmental health risks.

At a practical level, climate-change adaptation strategies, policies and actions and their integration into other policies are progressing at all governance levels (European Union, transnational, national and local levels). Further actions are to include:

› enhancing policy coherence across EU environmental and sectoral policies;

› effective and efficient action across all levels of governance, through multi-level governance and transnational cooperation platforms;

› enhancing flexible 'adaptive management' approaches;

› combining technological solutions, ecosystem-based approaches and 'soft' measures;

› involving the private sector;

› and more emphasis on 'transformational' adaptation actions as a complement to 'incremental' adaptation.[184]

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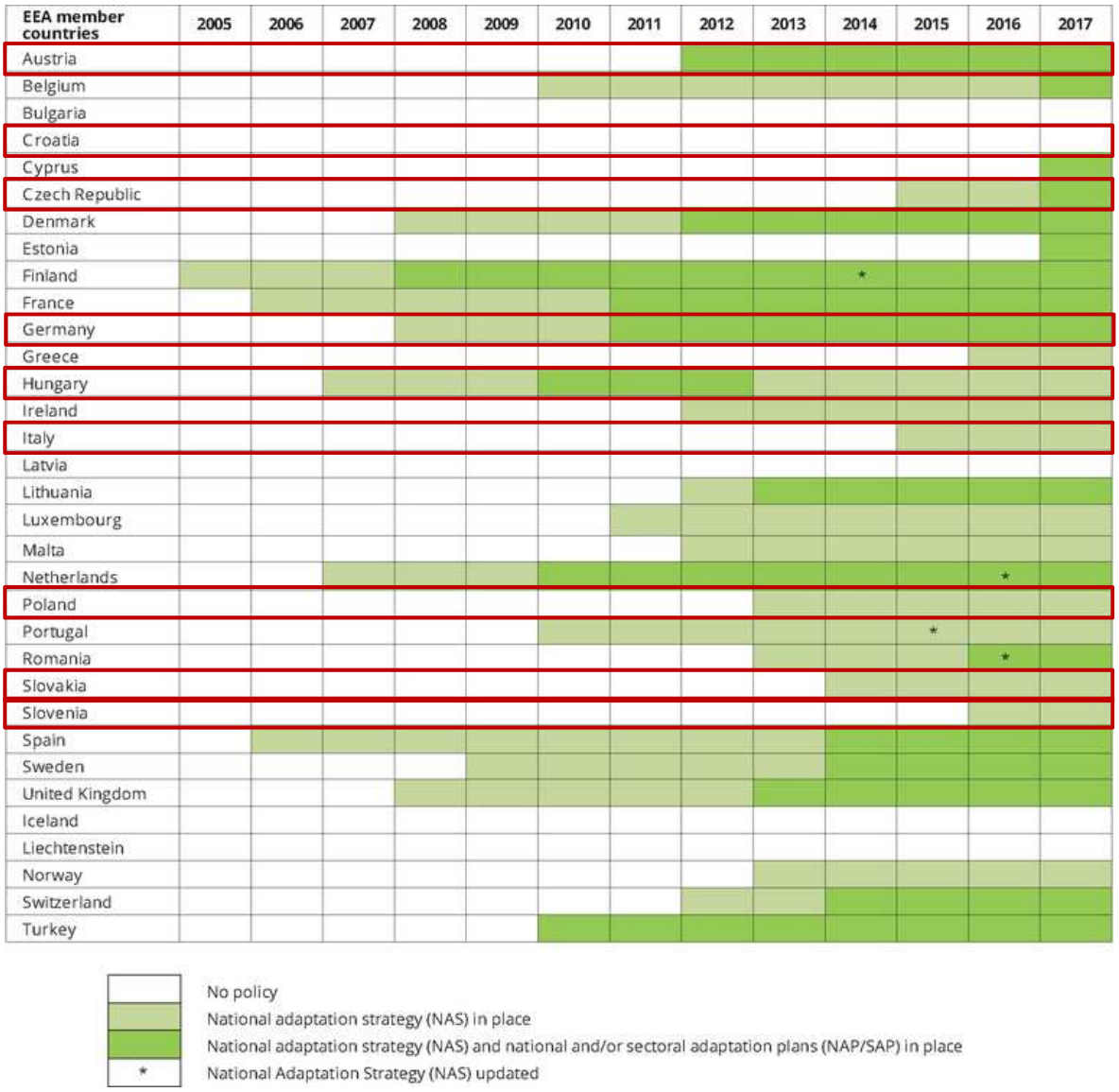
[182] Forzieri et al., 2016.

[183] EU, 2013, pp. 171-200.

[184] , p. 13.

Figure 2.38 / Overview of national and sectoral adaptation strategies and plans in Europe



Source: https://www.eea.europa.eu/data-and-maps/figures/overview-of-national-and-sectoral-2

There has been a steady increase over recent years in national adaptation strategies and plans in the area of climate change (see Figure 2.38). Most of the EU Member States have already adopted a national adaptation strategy, and several of them have developed a national adaptation plan as well. Remarkable progress regarding action plans has been reported for freshwater management, flood risk management, agriculture and forestry, with a focus on mainstreaming adaptation in these national sectoral policy areas. Transnational cooperation – such as strategies on knowledge sharing in adaptation to climate change – has increased, with an emphasis on adaptation as a cross-cutting policy area being recognised. Adaptation actions take place, within the EU strategies for the Baltic Sea region and the Alpine region, the Danube and Rhine Commissions, the Carpathian and Alpine conventions, the Working Community of the Pyrenees and the Mediterranean Action Plan/Barcelona Convention.[185]

[185] EEA, 2017, p. 16.

2.7.2. Climate change – policy areas

2.7.2.1. Increase in heat extremes

Description

Higher mean and maximum temperatures, coupled with an increasing frequency and intensity of heatwaves, represent one of the most consequential events affecting human comfort and sustained health. Heatwaves are expected to become more intense as climate change progresses. The rising number of heat days (air temperature rises above 30 °C) and tropical nights (minimum air temperature does not drop below 20 °C during the night) in vast areas of Europe will result in heat stress and increased heat mortality during the summer months in many European regions. Gradual climate change also influences health through changes in the habitat of disease-bearing vectors.[186]

Calculations published by the Intergovernmental Panel on Climate Change (IPCC) predict an increase in European annual temperatures of between 0.1 and 0.4 °C per decade. Eastern Europe will warm more rapidly in winter. On the one hand, winters that are now classified as cold may become much rarer by the 2020s and may even disappear by the 2080s; on the other hand, hot summers may become much more frequent.[187] Taking the projected change in the number of tropical nights in Central Europe (1961-1990 compared to 2071-2100), it is probable that in some Italian regions and in western Austria, eastern Germany and northern Poland the number of tropical nights will not grow or will grow only marginally (0-1). Other regions of Austria, Germany, the Czech Republic and Poland will probably report an increase of 1-3 tropical nights. The largest increase in the number of tropical nights is forecast for Slovenian, Hungarian and Slovak regions (up to 10).[188]

The lack of cooling during the night aggravates the daily heat stress. Temperature increase enlarges the risk of infections. Climate change influences health through changes in the habitat of vectors bearing diseases. The northward move of the mosquito-borne infectious disease malaria is a good example. Rising winter temperatures also reduce winter destruction of disease carriers, increasing their population. The other side of the coin is that they also reduce the risk of cold-induced infections and deaths due to freezing.[189]

TNC policy options

Beyond support for alternative energy production[190] and efficiency improvements in the use of energy (i.e. trying to slow down and stop the rise in temperature), there is another aspect of the challenge that up until now has received less consideration: namely *mitigation of and adaptation to the consequences of rising temperature*. Within the 2007-2013 period the CE Programme supported one such initiative, the

[186] ÖIR and PAN IGiPZ, 2012, p. 97.

[187] IPCC, 2012.

[188] IPCC, 2012.

[189] DG Regio, 2011.

[190] The most important challenge for Central Europe is to increase the production of renewable energy and so reduce the GHG emissions and hence, indirectly, the occurrences of heat extremes. Under the aegis of Interreg CENTRAL EUROPE, there are currently 18 transnational cooperation projects on low carbon topics running. With around EUR 34 million ERDF co-financing, partners from all over Central Europe are addressing shared regional challenges.

Urban Heat Island (UHI) project.[191] *Urban heat island* is a microclimatic phenomenon that occurs in metropolitan areas. It consists of a significant increase in temperature in the urban area, compared to the surrounding peri-urban and rural neighbourhoods. The UHI project aimed at developing mitigation and risk prevention and management strategies to deal with the urban heat island phenomenon. The project has been implemented in eight of the most relevant metropolitan areas and mega-urban regions of Central Europe. It incorporates a cooperation programme with the participation of the metropolitan cluster of Bologna–Modena, the urban corridor of Venice–Padua, Vienna, Stuttgart, Łódź and Warsaw, Ljubljana, Budapest and Prague.

While the reduction in GHG emissions will remain the mainstream cooperation thread in this challenge, we reckon on increased demand for further projects focused on the mitigation of the health effects of extreme heat. These may be transnational projects based on exchange of best practice and experience (both technical and financial) in insulating buildings and installing shading facilities that prevent the heat from entering the buildings. In the longer term, an increase in temperature can be mitigated through better urban planning, by allowing more vegetation in built-up areas. It is worth mentioning here the Interreg CE Programme specific objective 3.3,[192] where efforts are being made to improve environmental management in functional urban areas. The UGB – Urban Green Belts project[193] deals with urban green belts and supports the integration of the 'green infrastructure approach' into urban planning, in order to improve environmental performance and mitigate climate-change impacts.

A related challenge is the climate-proofing of buildings through climate-adapted architecture. No systematic data are yet available to indicate the efforts of the regions in this direction.[194]

The ability to cope with extreme events in the short term can be enhanced by warning systems and operative health plans, systems that have already been implemented by some cities. Comparable data do not exist on the number and effectiveness of such emergency plans. Transnational cooperation in Central Europe based on best practice would be expedient.[195]

2.7.2.2. Increasing risk of river floods

Description

Almost 1,500 flood and wet mass movement events occurred in European Environment Agency (EEA) member countries in the period 1980-2013, with more than half of them since 2000. These floods have resulted in over 4,700 fatalities and have caused direct economic losses of more than EUR 150 billion (based on 2013 values), which is almost one third of the damage caused by all natural hazards.[196]

For the end of the twenty-first century, the greatest increase in one-in-a-century floods is projected for the British Isles, north-west and south-east France, northern Italy and some regions of south-east Spain,

[191] http://eu-uhi.eu/

[192] http://www.interreg-central.eu/Content.Node/SO3.3.html

[193] http://www.interreg-central.eu/Content.Node/UGB.html

[194] DG Regio, 2011.

[195] DG Regio, 2011.

[196] http://www.munichre.com/en/reinsurance/business/non-life/natcatservice/index.html

the Balkans and the Carpathians. Less extreme increases are projected for Central Europe, the upper section of the Danube and its main tributaries.[197] A high-climate-change scenario could increase the socio-economic impact of floods in Europe more than three-fold by the end of the twenty-first century. A remarkable increase in flood risk is projected for Austria, Hungary, Slovakia and Slovenia.[198]

Table 2.2 / Impacts of extreme weather and climate-related events in the EEA member countries

Country	Loss (EUR million)	Loss per capita (Euro)	Loss per sq. km. (Euro)	Insured losses (EUR million)	Insured losses (%)	Fatalities (Number)
Austria	12,726	1,590	151,719	3,819	30	590
Croatia	2,744	612	48,478	67	2	721
Czech Republic	10,014	968	126,978	3,357	34	207
Germany	92,144	1,217	257,835	42,795	46	9,829
Hungary	5,767	561	61,999	127	2	703
Italy	61,778	1,072	204,514	2,359	4	20,629
Poland	13,730	362	43,912	890	6	1,187
Slovakia	1,635	308	33,335	104	6	104
Slovenia	1,630	817	80,391	200	12	241

Note: In Euro 2016 prices, based on the damage records from the NatCatSERVICE of the Munich RE insurance company and the Eurostat structural indicators.
Source: https://www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-3/assessment-1

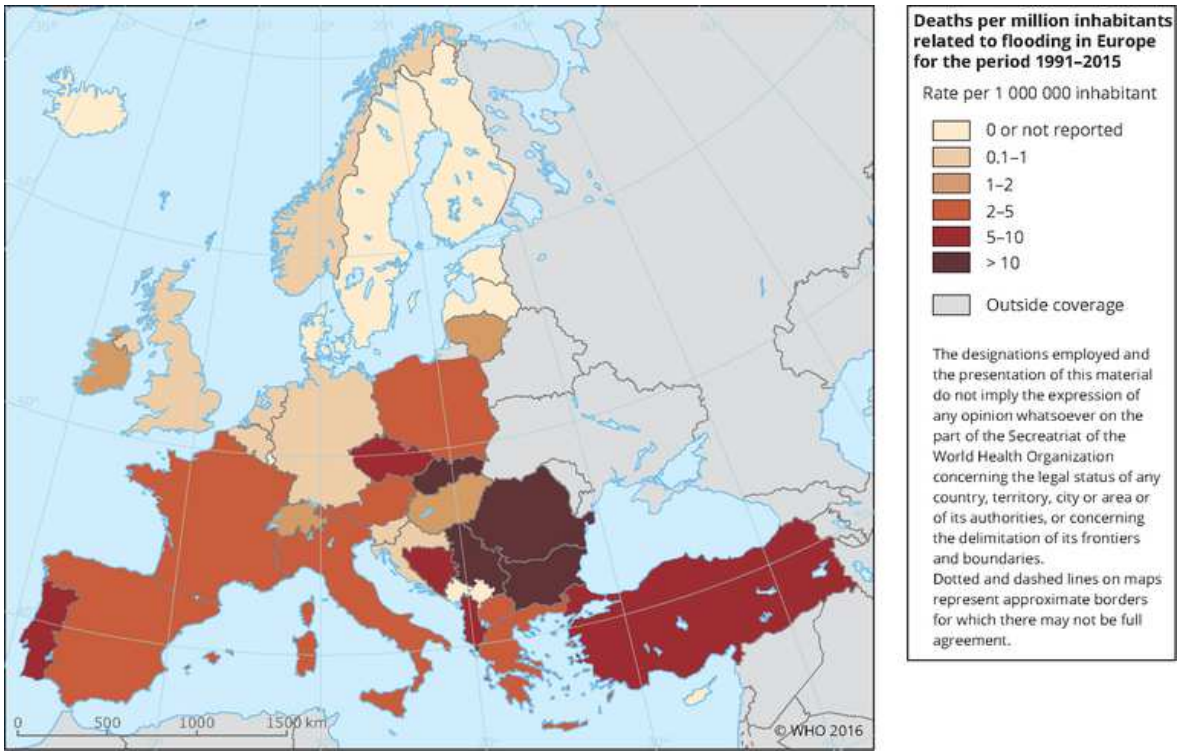
In the Central European region, the most significant natural hazard is river floods, in terms of both scale and impact. The reasons are excessive precipitation and temperature rise, coupled with inappropriate and careless land use. This is an interregional problem, because major Central European river basins are mostly located in more than one country. In order to minimise the risks related to floods and reduce the negative impacts, transnational measures and cooperation are indispensable. The Floods Directive 2007/60/EC 84 requires an evaluation of flood risk and preparation of flood risk maps for EU Member States. An analysis of the physical exposure to floods in Central Europe came to the conclusion that this political-geographical region is at high risk in comparison to the rest of Europe. Nearly the whole area is potentially exposed to floods. The most alarming perspective was found for the Danube river basin. This river basin covers most of Central Europe's territory. Beyond that, a significant physical exposure to floods was registered for the south and south-east of Poland, the north-west of the Czech Republic, and regions that formerly made up the German Democratic Republic (Vistula, Oder and Elbe rivers).[199]

[197] EEA, 2017, p. 141.

[198] Alfieri et al., 2015, cited in EEA, 2017, p. 142.

[199] ÖIR and PAN IGiPZ, 2012, p. 95.

Figure 2.39 / Deaths related to flooding in Europe



Source: https://www.eea.europa.eu/data-and-maps/indicators/floods-and-health-1/assessment

TNC policy options

River floods in Central Europe, where the large river basins span several countries, should be the prime focus for transnational cooperation. TNC should include sharing knowledge on prevention and uniting technical and, if needed, human resources if floods occur. Regulation of rivers is expensive. Innovative financial solutions for the pooling of resources from various EU funds enabled in the next Multiannual Financial Framework of the EU may help. Regulation of rivers opens up opportunities for alternative utilisation of the areas concerned for recreation. An example of best practice that could possibly be shared in Central Europe is the recreational area 'Neue Donau', established as part of the regulation of the Danube in Vienna.

The main data sources for Europe-wide studies of the impacts of river floods and river droughts are global databases, in particular EM-DAT by the Centre for Research on the Epidemiology of Disasters (CRED),[200] which focuses on the impacts on human health, and the NatCatSERVICE of Munich RE,[201] which focuses on the costs of economic damage. These databases are compiled from various sources. The differences in definitions, thresholds, classification criteria and reporting approaches should be taken into account when interpreting the data. Over recent years, these global databases have been harmonised, but some important differences remain.[202]

[200] www.emdat.be

[201] http://www.munichre.com/en/reinsurance/business/non-life/natcatservice/index.html

[202] EEA, 2017, p. 317.

Data on the impacts of floods since 1980, as reported within the preliminary flood risk assessments of EU Member States, have been collected and published by the EEA.[203] However, time series are not complete and are difficult to compare across countries. The Joint Research Centre (JRC)[204] has reviewed the status and best practices of disaster loss data recording and has prepared guidance for EU Member States, in close collaboration with the various Member States. This is expected to help in improving the comparability and consistency of data on the impacts of floods.[205]

Despite general agreement that Europe-wide (or at least transnational-scale) flood hazard maps have many potential applications, including climate-change studies, only a few products exist, and it remains difficult to compile large consistent datasets.[206] The EU Floods Directive has so far improved the situation only to a limited extent.[207]

In the framework of the CE Programme, three projects were implemented in 2007-2013 in this area: LABEL, CEframe and INARMA.[208] Furthermore, INCA-CE[209] has developed a 'now-casting system' (forecasting for the next few hours) for better risk management. Currently two related Interreg CE projects are running: Project RAINMAN[210] is analysing the consequences of heavy rains and the related risks, while PROLINE-CE[211] has the main objectives of improving the protection of drinking-water resources and safeguarding regions against floods and droughts through an integrated land use management approach. ProteCHt2save[212] aims at improved protection, management and sustainable use of the cultural heritage, by strengthening its resilience to flood, heavy rain and droughts linked to climate change (e.g. risk maps, preparedness strategies, evacuation plans, etc.).

2.7.2.3. Water scarcity

Description

Water scarcity may seriously influence a number of areas, from drinking-water supply and agriculture to water-borne transport and infectious diseases. Central Europe is affected in these areas to varying degrees.

A broad analysis of climate-change scenarios for agricultural productivity in Europe projects a deterioration in agro-climatic conditions through increased drought stress and a shortening of the active

[203] EEA, 2016a.

[204] http://drr.jrc.ec.europa.eu/

[205] EEA, 2017, p. 317.

[206] Alfieri et al., 2014.

[207] EEA, 2016a.

[208] http://www.label-eu.eu/, https://www.keep.eu/keep/project-ext/15807/Central%20European%20Flood%20Risk%20Assessment%20and%20Management%20in%20CENTROPE, www.interreg-central.eu/Content.Node/3-environment-final.pdf

[209] https://www.keep.eu/keep/project-ext/15837/INCA-CE

[210] http://www.interreg-central.eu/Content.Node/RAINMAN.html

[211] http://www.interreg-central.eu/Content.Node/PROLINE-CE.html

[212] www.interreg-central.eu/Content.Node/ProteCHt2save.html

growing season across large parts of southern and Central Europe.[213] Other studies suggest an increasing number of unfavourable years for agricultural production in many European climatic zones, limiting winter crop expansion and increasing the risk of cereal yield loss.[214] An aggregated picture of the expected changes emerges in crop yields across Europe by considering three crops. These estimates include the effects of changes in temperature, precipitation and CO_2 concentration on crop yield. The regional pattern of projected impacts is clear, generally showing improved conditions in northern Europe and worse conditions in southern Europe. Central Europe remains practically unaffected, with projected changes in water-limited crop yield of between -5% and +5%.[215]

Simulations based on the WOFOST crop model,[216] which considers the effect of increases in CO_2 concentrations on the water-use efficiency of maize, found an increasing crop-water deficit over large areas of Europe, in particular Central Europe.[217]

The 7th framework project ECCONET [218] assessed the impact of climate change on inland waterway transport, as well as possible adaptation measures. The project scrutinised the Rhine–Main–Danube corridor as a case study, with emphasis on low water situations. The research results based on projections from different climate models show no significant effects on low flow conditions for the Rhine and the Rhine–Main–Danube canal until 2050. However, the upper Danube may experience a moderate increase in low flow conditions. The trend towards drier summers on the one hand and winters with more rainfall on the other hand will gain in importance towards the end of this century.[219]

TNC policy options

In 2007-2013, the Interreg IVC Programme supported the project WATER CoRe,[220] which sought to provide an exchange platform for water scarcity and drought issues at the regional and local level for all European regions. Special attention was paid to regions in Central Europe by establishing a focal point for water scarcity and droughts in Hungary.

Regarding water scarcity and droughts, the EEA is revising the water exploitation index,[221] so that it will be calculated based on the level of river basins, instead of on the administrative boundaries of countries. That enhances the overview needed to launch transnational cooperation in this sphere.

The JRC maintains the European Drought Observatory[222] for forecasting, assessment and monitoring. However, there is currently no systematic, comprehensive record of such events in Europe that

213 Olesen et al., 2011.

214 Peltonen-Sainio et al., 2011 and Rötter et al., 2011.

215 EEA, 2017, p. 235.

216 https://www.wur.nl/en/Expertise-Services/Research-Institutes/Environmental-Research/Facilities-Products/Software-and-models/WOFOST.htm

217 EEA, 2017, p. 238.

218 https://www.ecconet.eu/

219 EEA, 2017, p. 261.

220 http://www.interreg4c.eu/projects/project-details/index-project=50-water-scarcity-and-droughts-coordinated-actions-in-european-regions&.html

221 https://www.eea.europa.eu/data-and-maps/indicators/use-of-freshwater-resources-2/assessment-2

222 https://ec.europa.eu/jrc/en/scientific-tool/data-and-tools-european-drought-observatory

describes their duration, impact and severity, other than meteorological time series for precipitation. The establishment of a Europe-wide centre and regional information centre would be a good example of TNC. Issues with special Central European emphasis may be addressed in the related CE project. Reporting under relevant EU legislation and policies, including the Water Framework Directive and the Floods Directive, has improved data availability and is expected to further enhance the knowledge base in the future.[223]

2.7.2.4. Increase in energy demand for cooling

Description

Between the periods 1951-1980 and 1981-2014, the number of population-weighted cooling degree days (CDD) increased by 49.1%; the increase in the period 1981-2014 was on average 1.2 CDDs per year (1.9% per year). The largest absolute increase occurred in southern Europe (latitudes below 45 degrees north), where the energy demand for cooling in summer is highest. CDDs are defined relative to an agreed outside temperature above which a building is deemed to need cooling. Temperature is, however, only one factor influencing related demand for energy. It also depends on a large number of other factors, like building design, energy prices, income levels and behavioural aspects. The projected increases in the cooling demand in southern and Central Europe may further exacerbate peaks in electricity demand in the summer, unless appropriate adaptation measures are taken.[224]

TNC policy options

The challenge of increase in demand for cooling is closely related to the challenge of 'increase in heat extremes' addressed above. Transnational policy options are partly identical in the case of both challenges. We mention here the exchange of best practices and experience concerning the insulation of buildings, shading facilities to prevent the heat from entering the buildings, more vegetation in built-up areas, better urban planning in general and climate-adapted architecture in particular.

Another option is to mitigate the consequences of the increased energy demand due to cooling via improvements in energy efficiency. In fact, every individual case of transnational cooperation with the aim of enabling more efficient energy production, distribution and use helps, indirectly, to deal with the challenge concerned. It is important to mention in this context the 2007-2013 projects CEC5 and EnSURE and the current Interreg CE project eCentral.[225]

Interreg CE supports the project GeoPLASMA-CE, which is analysing the different aspects of shallow geothermal use for heating and cooling in both urban and non-urban regions of Central Europe. In cooperation with geological survey organisations, universities, non-profit organisations, administrative

[223] https://water.europa.eu/

[224] EEA, 2017, p. 248.

[225] https://www.keep.eu/keep/project-ext/15898/CEC5, https://www.keep.eu/keep/project-ext/15824/EnSURE?ss=7adf0f030aabafd37315d1cb426af3c8&espon=, http://www.interreg-central.eu/Content.Node/eCentral.html

bodies and private expert companies, new management strategies for a reasonable and sustainable use of shallow geothermal application will be explored in six countries in multiple pilot areas.[226]

2.7.3. Summary

Climate change will become the biggest challenge for mankind in the twenty-first century. Compared to other continents and, within Europe, to some other major regions, Central Europe is modestly exposed. The two main challenges will be the increase in heat extremes and flood events. This topic has already been at the focus of Interreg CE activities, and most probably it will remain at the centre of attention. Beyond TNC on 'low carbon' topics, there is room for increased cooperation in the mitigation of extreme heat effects. These may include transnational projects based on exchange of best practice and experience concerning the insulation of buildings, the installation of shading facilities to prevent the heat from entering the buildings, better urban planning, more vegetation in built-up areas and climate-proofing of buildings through climate-adapted architecture. No systematic data are yet available to indicate the efforts of the regions in this direction.

River floods in Central Europe, where the large river basins span several countries, should be the prime focus of transnational cooperation. TNC should include sharing knowledge on prevention, risk management and experience, and further uniting technical and (if necessary) human resources if floods should occur.

Instead of being based on the administrative boundaries of countries, the water exploitation index, which indicates water scarcity and drought, will in future be calculated based on the level of river basins. That will enhance the overview needed to launch transnational cooperation in this sphere.

As currently there is no systematic and comprehensive record of events related to water scarcity and droughts in Europe that describes their duration, impact and severity, the establishment of a Europe-wide and regional information centre would be a good example of TNC in this field. The challenge of an increase in demand for cooling is closely related to the challenge 'increase in heat extremes'. Transnational policy options are, to a large extent, identical in the case of both challenges. Another approach is based on mitigation of the consequences of the increased energy demand due to cooling via improved energy efficiency. In fact, every individual case of transnational cooperation with the aim of enabling more efficient energy production, distribution and use helps, indirectly, to deal with the challenge concerned.

Therefore, it is recommended that climate change should be kept in the focus of future CE Programme. In combination with environmental and circular-economy issues, it could be addressed via a dedicated priority axis in a future Interreg CE Programme.

[226] http://www.interreg-central.eu/Content.Node/GeoPLASMA-CE.html

2.8. EMPLOYMENT AND SKILLS

2.8.1. Employment and skills challenge

Employment is an essential prerequisite to reduce poverty and limit social exclusion. In principle, being employed allows individuals to cover their basic needs and provides opportunities to participate in society. Moreover, employment is closely related to education and training. In a world with technological change and a rapid labour market transformation, individuals need to have opportunities to update and improve their skills continuously.[227] This enables them to remain in employment and reduces the risk of unemployment.

Although EU employment rates are already back to their pre-crisis level, unemployment rates are still high in some Member States. In parts of the CE territory – such as Croatia, Slovakia and Italy – they are above the EU average, though in the latter case this is mostly because of southern Italy. While youth unemployment prevails in southern European countries, the south-eastern periphery of Europe reveals large deficits in terms of education level. By contrast, labour market transformation operates equally on the periphery and in the most industrialised regions of the European centre.[228]

To address these challenges, the EU has initiated steps to foster employment, fight unemployment and enhance education levels. A common European employment strategy[229] was declared in 1997, and the European 2020 growth strategy embeds this defined common strategy. Thus, employment should account for 75% of individuals aged 20-64. With respect to education, the rates of early school leavers should be below 10%, and at least 40% of individuals aged 30-34 should have completed higher education. More recently, in 2016 the EU addressed the employment and education dimension by launching the European Pillar of Social Rights.[230] This underlines the interrelatedness of employment, education and social risks, including poverty and social exclusion.

The first category of the European Pillar of Social Rights comprises the principles of education, training and life-long learning, as well as active support for employment. The major challenges with respect to employment and skills are:

› Education systems
› Skill upgrading and life-long learning, and
› Youth unemployment and young people not in employment, education or training (NEET).

The next section discusses these challenges in a bit more detail, highlights their relevance for the CE countries and identifies TNC policy options.

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227 EU Commission, 2017c.

228 DG Regio, 2011.

229 http://ec.europa.eu/social/main.jsp?catId=101&langId=en

230 https://ec.europa.eu/commission/priorities/deeper-and-fairer-economic-and-monetary-union/european-pillar-social-rights/european-pillar-social-rights-20-principles_en

2.8.2. Employment and skills – policy areas

2.8.2.1. Education system

Description

At an individual level, lower-educated people are highly vulnerable to unemployment and social exclusion. They are also less likely to participate in training and life-long learning. At an aggregate level, a high level of human capital accumulation is a prerequisite for economic growth, while low levels of human capital are associated with low levels of competitiveness. From a policy point of view, in the European Pillar of Social Rights, the EU advocates quality and inclusive education to improve skills, which allows people to play a full part in society, participate in labour markets and cope with its transformation.

One indicator of human capital accumulation is the proportion of individuals with tertiary education (university degree or similar) aged between 25 and 64 – see Figure 2.40. Among CE countries, in Austria, Slovenia, Poland and Germany nearly one third of individuals in this age group have completed tertiary education. In Hungary, the Czech Republic, Croatia and Slovakia, the figure is between 20% and 25%, and in Italy it is only 17.5%.

Figure 2.40 also shows that, compared to other European regions, the CE territory is generally characterised by a low share of individuals with tertiary education. For most CE countries, this is not an obstacle to growth, however, as their economies are heavily reliant on manufacturing industries (Italy is an exception to this). The manufacturing sector draws mainly on highly qualified workers who have completed secondary education; most CE countries are well supplied with such people. In Germany and Austria, the supply of industrial workers is also supported by an apprenticeship system that not only produces a highly qualified workforce, but also improves matching between labour supply and the labour demand of firms.

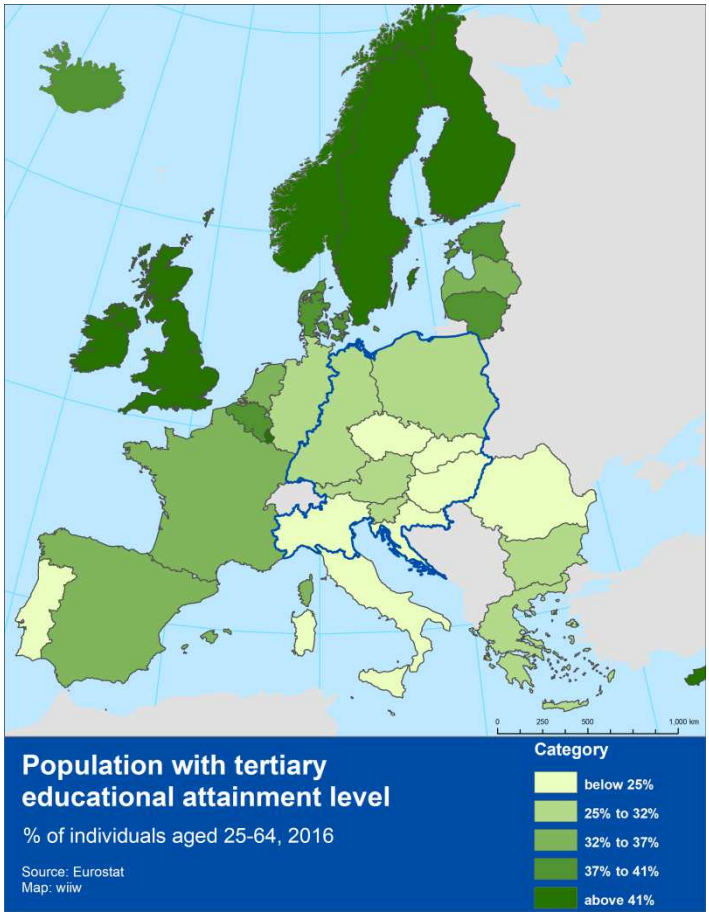
TNC policy options

Even though CE education systems seem to differ from those in other European countries in terms of ‘producing’ people with completed tertiary education, for now this is not much of a problem, given the strong industrial base of most CE countries. At present, some manufacturing sectors even report labour shortages, as the demand for qualified industrial workers is higher than their supply.

Future prospects may be less positive, though, given the changes in technology that will affect manufacturing industry both from a production and a product point of view. Production will become more digitised and technologically advanced, while traditional products will sooner or later be replaced by more modern ones (e.g. electric cars). These shifts are also likely to change the type of skills demanded in the labour market, making it necessary for CE economies to adjust their education systems accordingly to stay competitive.

Figure 2.40 / Population with tertiary educational attainment level

% of individuals aged 25-64 (2016)



Note: Blue line indicates CE territory
Source: Eurostat.

TNC can hardly change national education systems. Its strength lies in its ability to focus on specific areas – both topical and geographical – that are of mutual interest to CE countries or regions. One example of this is the CE 2007-2013 WOMEN project,[231] which aimed at mitigating the brain drain of well-qualified young women by highlighting potential career prospects, especially in rural areas, through a number of pilot actions (such as an image campaign and a women's award scheme) and the creation of a network of successful female entrepreneurs and senior staff to increase the social attachment of women to their regions. Another example is the CE2007-2013 i.e.SMART project,[232] which specifically addressed innovation-related knowledge and human capital development by developing, among other things, training programmes for entrepreneurs (similar to the current Interreg CE project CERIecon),[233] as well as a transnational strategy and action plan to institutionalise the project's concept, approach and

[231] http://www.central2013.eu/nc/projects-2007-2013/approved-projects/funded-projects/?L=..%2F..%2F..%2F&tx_fundedprojects_pi1[project]=134

[232] http://www.central2013.eu/nc/projects-2007-2013/approved-projects/funded-projects/?L=..%2F..%2F..%2F&tx_fundedprojects_pi1[project]=116

[233] http://www.interreg-central.eu/Content.Node/CERIecon.html

outputs. Finally, the Interreg CE project FabLabNet[234] aims to foster international fabrication laboratory[235] networks and links both with schools and businesses.

2.8.2.2. Skill upgrading and life-long learning

Description

Labour markets are continuously changing in terms of the skills and qualifications demanded. This transformation is associated with pressuring workers to become more flexible, while at the same time making their position more vulnerable in terms of job security. Thus, for any country or region, there is a policy need to keep upgrading the skills of the labour force, in order to stay competitive and remain an attractive place to invest, work and live. Consequently, the higher the share of individuals who participate in life-long learning and skill-upgrading activities, the higher the regional adaptive capacity to labour market transformations.

A major role in skill upgrading is played by the availability of vocational training. Figure 2.41 illustrates the 2015 share of enterprises that provide continuing vocational training (CVT) courses and/or other forms of CVT in European countries. In the CE countries, the supply of CVT varies a lot. In the Czech Republic, Austria, Slovenia and Germany, 75% to 90% of all enterprises offer training schemes for their employees, whereas Italy, Croatia and especially Poland and Hungary have very low levels of CVT, both in absolute terms and in comparison to the EU-28 average.

Additionally, Figure 2.42 provides evidence of life-long learning (LLL) in the CE countries. Here again, some major differences are to be found between the individual CE countries. More fundamental, however, is the fact that overall, the CE territory performs very badly in terms of LLL compared to other, especially Nordic, European countries.

TNC policy options

In the future, skill upgrading and LLL will become increasingly important – not only because of the technological change, but also due to demographic factors. Population ageing, as well as migration to urban centres, will increasingly have a negative effect on the economic and social development of rural areas in the CE territory. Thus, continuous policy support for the upgrading of skills and LLL is a necessary investment that urban – and even more so rural – regions have to consider, in order to remain an attractive place to invest, work and live.

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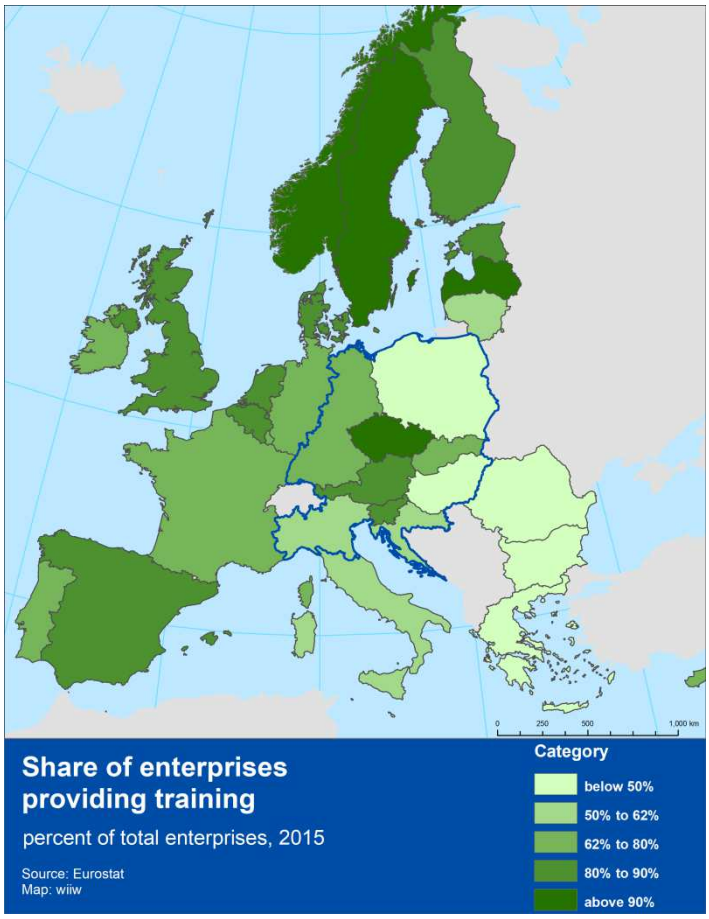
234 http://www.interreg-central.eu/Content.Node/FabLabNet.html

235 Fabrication laboratories are technical prototyping platforms for innovation and invention inviting the society at large to become innovators.

Figure 2.41 / Share of enterprises providing training, in % (2015)



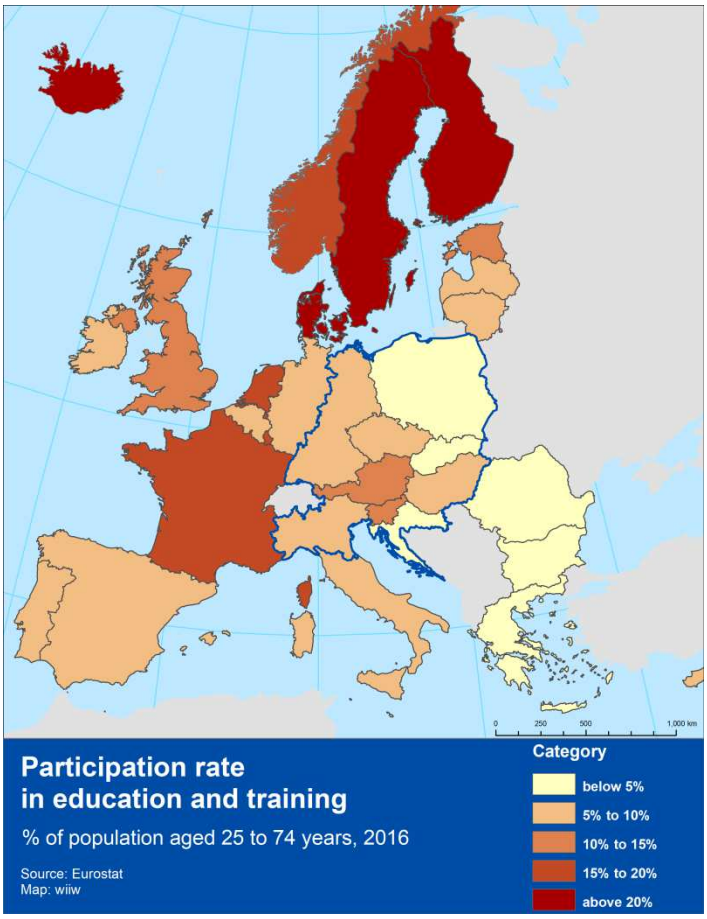
Note: Blue line indicates CE territory
Source: Eurostat.

Given the differences in vocational training systems and LLL between the CE territory and the best-performing EU countries, there is ample room for increased TNC via the exchange of experience and training models, and the development of joint strategies or pilot actions, such as specific training programmes. A good example of this is the CE 2007-2013 Senior Capital project,[236] which aimed at developing knowledge and enlarging the workforce quality of people aged over 50. To this end, the project included: a) analytical work to identify best-practice models, as well as institutional and financial barriers, b) concrete policy recommendations, action plans and a benchmark study and c) pilot actions to find solutions for the better inclusion of older people in education and employment. Another example is the IDEA project,[237] which focused on the development and implementation of a common strategy for coping with challenges in safeguarding human capital for the innovation process.

[236] https://www.keep.eu/keep/project-ext/15909/Senior%20Capital

[237] http://www.central2013.eu/nc/projects-2007-2013/approved-projects/funded-projects/?L=..%2F..%2F..%2F&tx_fundedprojects_pi1[project]=77

Figure 2.42 / Participation rate in education and training from 25 to 74 years, in % (2016)



Note: Blue line indicates CE territory
Source: Eurostat.

2.8.2.3. Young people not in employment, education or training (NEET)

Description

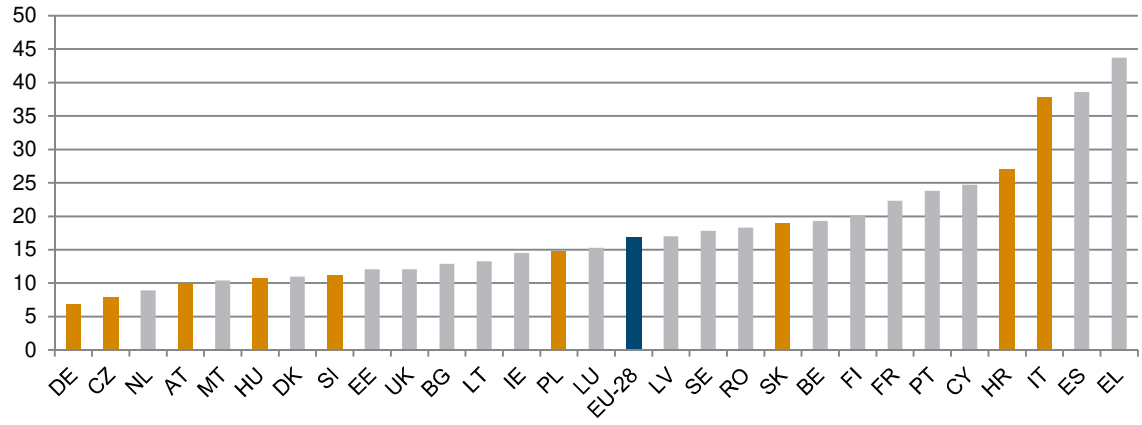
The economic crisis has put pressure on youth unemployment and the labour market participation of young individuals. Moreover, it has reinforced the vulnerabilities of young individuals with respect to education and training. As a result, in the EU there is now high youth unemployment, including a growing number of young individuals not in employment, education or training (NEET). This is a major issue for EU policy (addressed by the Youth Guarantee[238] – a commitment by all Member States to ensure the employment and education of all young people under the age of 25), as this group is not only highly vulnerable to the risks of poverty and social exclusion, but also has its creative, economic and skill potential wasted.

The extent of youth unemployment (i.e. in the population aged 25 years or younger) in EU countries is shown in Figure 2.43. In most CE countries, youth unemployment rates are very low compared to the

[238] http://ec.europa.eu/social/main.jsp?catId=1079

EU average. In fact, five out of the eight EU countries with the lowest youth unemployment rates are CE countries: the Czech Republic, Germany, Austria, Hungary and Slovenia. Youth unemployment is more problematic in Slovakia and especially Croatia and Italy, though in the latter case this is mainly on account of southern Italy and does not refer to the Italian CE regions.

Figure 2.43 / Youth unemployment rate, 2017*

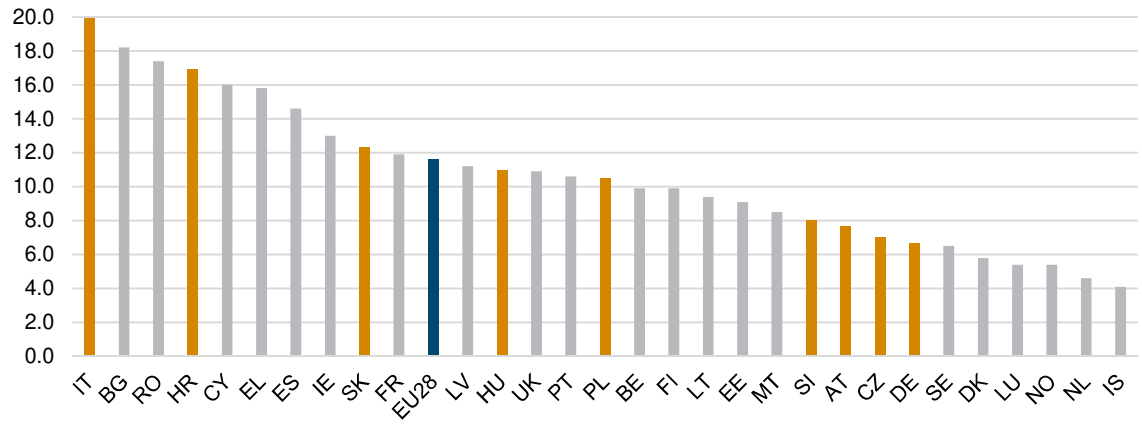


*Note: Italy: 2016
Source: Eurostat.

Figure 2.44 shows the 2016 NEET rates as a percentage of the total population aged 15-24. It indicates that in Italy and Croatia some 17% to 20% of the young population are not in education or training, and do not have any employment. In Slovakia, the share is 12% and thus slightly higher than the EU-28 average. All other CE countries have NEET rates lower than the EU average, though Hungary and Poland are very close to it (11%). Slovenia, the Czech Republic, Austria and Germany have the lowest NEET rates in the CE territory.

Figure 2.44 / Young people not in employment, education or training (NEET)

% of non-employed individuals aged 15-24 (2016)



Source: Eurostat.

TNC policy options

Depending on the number of young unemployed and NEETs, the loss of future personal, economic and social potential can be very high for some CE countries or regions. Additionally, high current unemployment and NEET rates are likely to spill over into the future, leading to an accumulation of economic and social problems, such as high unemployment and social risks, low competitiveness or attractiveness for investment and living, etc. Because of this, bringing young people into education, training or employment should be of interest to policy makers.

Some of the NEET-related problems are due to an overall sluggish economic development (e.g. a general lack of jobs), such as in Italy and Croatia. However, other problems (e.g. the integration of young people from ethnic minorities or with a migration background) are more of a systemic nature and potentially could be addressed by TNC. For instance, TNC could promote best-practice examples or launch pilot actions providing training to young people. Within the framework of the CE Programme, examples of this include the 2007-2013 YURA project[239] and the current CERIecon[240] project.

2.8.3. Summary

Employment, education and skills are important factors for the economic and social development of the CE countries and regions; this places them high on any policy agenda. TNC certainly can contribute to tackling these challenges and, as the examples show, has successfully done so in the past.

Still, employment, education and skills should not be an explicit priority axis of a future CE TNC programme. The European Social Fund[241] (ESF) addresses all these challenges on a much bigger scale, thus allowing much broader policy responses to employment-related challenges. The strength of TNC lies in making very specific, complementary contributions on a transnational basis, while ESF operates mostly on a national basis only. Nevertheless, it is recommended that employment, education and skills-related issues should be addressed as a horizontal issue on other priority axes, the more so as they cover topics that are important for the future development of the CE territory, such as innovation, energy efficiency and environmental sustainability. Developing skills and knowledge in these areas and disseminating them to the wider public could thus be considered to be a complementary action to existing Interreg CENTRAL EUROPE projects, which would enhance their visibility, effects and sustainability.

[239] http://www.central2013.eu/nc/projects-2007-2013/approved-projects/funded-projects/?L=..%2F..%2F..%2F&tx_fundedprojects_pi1[project]=72

[240] http://www.interreg-central.eu/Content.Node/CERIecon.html

[241] http://ec.europa.eu/social/main.jsp?catId=325&langId=en

2.9. SOCIAL RISKS

2.9.1. Social risks challenge

Social risks and social polarisation are multidimensional. The key challenge refers to poverty and material deprivation, as well as social exclusion. The unequal distribution of material and non-material resources corresponds to unequal access to public and private services, and that affects people's opportunity to take part in society.[242] A further dimension is labour market transformation. Decreasing job stability and increasing work flexibility contribute to social risks and polarisation.[243] Moreover, increasing wealth and income inequality in societies adds to the challenge of social risks, as does limited access to services of general economic interest (SGEI). In this respect, social cohesion addresses these issues and aims to combat poverty, inequality and social exclusion.[244]

For a long time, the EU has been fighting poverty and social exclusion, and thus supporting social cohesion. In the Europe 2020 strategy, reducing poverty and social exclusion is identified as a major target. More recently, the EU started putting more emphasis on this by launching the European Pillar of Social Rights.[245] This framework aims to foster social justice and upward social mobility, and to reduce poverty and income inequality.[246] In addition, EU actions also focus on labour market transformation. More specifically, the Pillar encompasses the following principles structured in three categories:

1. **Equal opportunities and access to the labour market,** covering: a) education, training and life-long learning, b) gender equality, c) equal opportunities and d) active support for employment;

2. **Fair working conditions**: a) secure and adaptable employment, b) wages, c) information about employment conditions and protection in case of dismissals, d) social dialogue and involvement of workers, e) work-life balance and f) a healthy, safe and well-adapted work environment and data protection;

3. **Social protection and inclusion**: a) childcare and child support, b) social protection, c) unemployment benefits, d) minimum income, e) old-age income and pensions, f) healthcare, g) inclusion of people with disabilities, h) long-term care, i) housing and assistance for the homeless and j) access to essential services.

In all three areas outlined above, there is potential for cooperation across national borders. Moreover, actions at this level may improve the functioning of the European (labour) market, and may even further enhance a European sense of belonging. In the next sections, the three areas above and the most important principles for the Interreg CE Programme are discussed with respect to TNC relevance and policy options.

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[242] EU Commission, 2012.

[243] EU Commission, 2015.

[244] EU Commission, 2012.

[245] https://ec.europa.eu/commission/priorities/deeper-and-fairer-economic-and-monetary-union/european-pillar-social-rights/european-pillar-social-rights-20-principles_en

[246] EU Commission, 2018.

2.9.2. Social risks – policy areas

2.9.2.1. Equal opportunities and access to the labour market

Description

A well-functioning society provides equal opportunities to all individuals and is free from discrimination. Moreover, all individuals who want to participate in the labour market should have the opportunity to do so. The labour market transformation can be associated with the relocation of business and off-shoring processes, as well as job instability; all this puts pressure on specific groups in society. Inequality of opportunities can further be associated with unequal access to education and social protection, employment and thus the labour market.

Figure 2.45 shows the share of individuals living in households with very low work intensity in European countries.[247] This measure captures individuals who have difficulties in accessing the labour market, which in turn can reflect an uneven distribution of opportunities. Among the CE countries, Croatia and Italy are characterised by a relatively high share (well above 12%) of households with low work intensity (and these are also among the countries with the highest shares in the EU as a whole). The only CE country that has a share close to the EU-28 average of around 10% is Germany. The figure for the other CE countries ranges from 6% to 8%.

TNC policy options

Since employment does not always protect against poverty and social exclusion, it is important to support individuals to find sustainable and quality employment. In order to encourage the employment of especially disadvantaged groups in society and address disadvantaged regions, the EU has already initiated some cross-country cooperation. For example, the Interreg CE project SENTINEL[248] is a transnational project between different European organisations to coordinate and support social enterprises. The project aims to increase the awareness of social enterprises, create a positive image and increase general knowledge about the social economy.

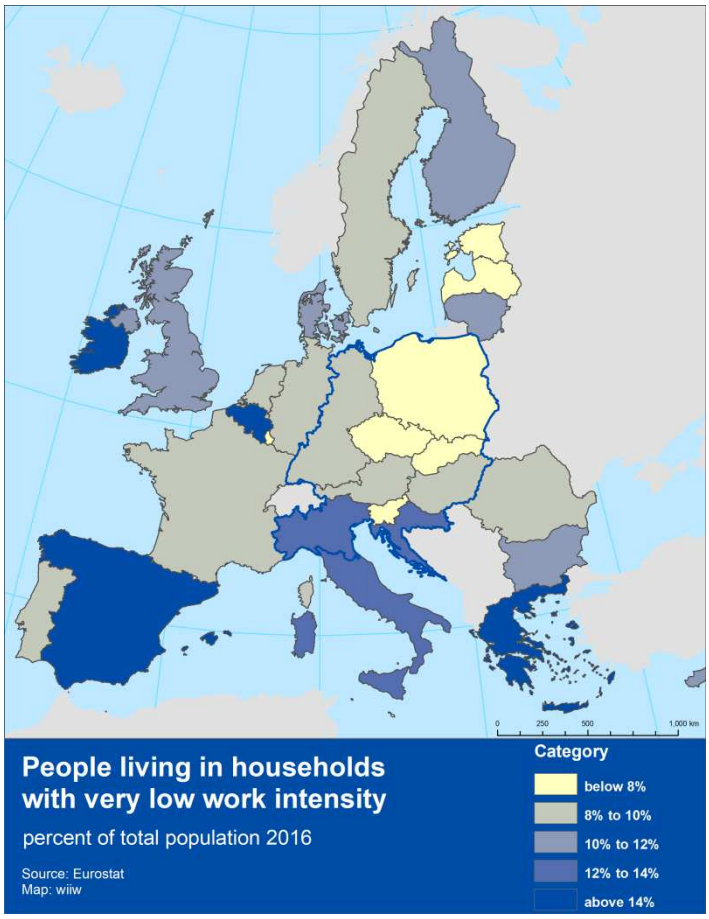
A further example is the Interreg CE project INNO-WISEs.[249] Involving cooperation between five countries, people from different fields work together to improve the capacity of the social economy to offer qualified jobs to disadvantaged groups. The major goal of the project is to create a platform to exchange and discuss best practice.

[247] Defined as the number of individuals living in a household where adults (18-59 years old) work 20% or less of their total work potential during one year.

[248] http://www.interreg-central.eu/Content.Node/SENTINEL.html

[249] http://www.interreg-central.eu/Content.Node/INNO-WISEs.html

Figure 2.45 / People living in households with very low work intensity, in % (2016)



Note: Blue line indicates CE territory
Source: Eurostat.

Furthermore, through the Interreg CE project Social(i)Makers,[250] regions are developing and testing solutions to tackle the current social challenges. The project aims to increase and empower the collaborative organisation of effective and sustainable social innovation initiatives. Furthermore, it wants to develop the capacities of all stakeholders (financiers, entrepreneurs, policy makers and citizens) to design and launch such initiatives.

Actions that address social innovations and employment in disadvantaged and more poorly developed regions should be intensified. The knowledge and know-how of local stakeholders and partners should be extracted, while ideas for potential activities should circulate between different regions and should be discussed together. This will allow the establishment of a transnational community for social enterprises and innovations, where activities are planned and discussed at the cross-country level, though implemented at the local level. In the framework of the CE project EURUFU[251] (2007-2013), the EU has already initiated a transnational network for knowledge transfer to develop suitable strategies for providing equal opportunities for inhabitants of disadvantaged territories.

[250] http://www.interreg-central.eu/Content.Node/Social(i)Makers.html

[251] http://apps.thueringen.de/eurufu/en/

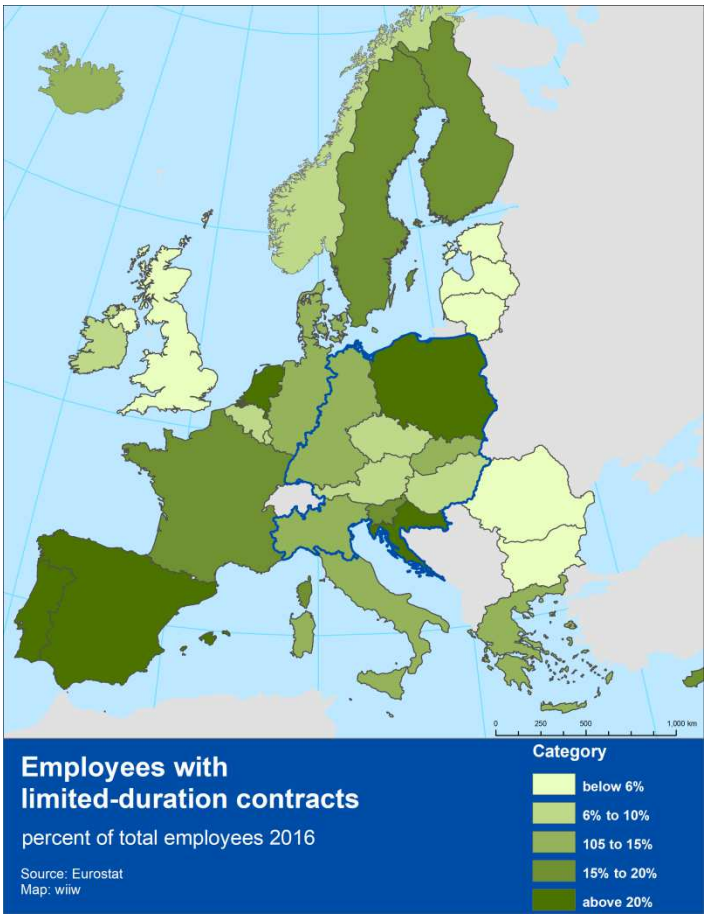
2.9.2.2. Fair working conditions

Description

Ideally, workers should have fair and equal treatment with respect to working conditions, access to social protection and training. Wages should guarantee a certain standard of living and should prevent in-work poverty. At the same time, the recent labour market transformation in the EU has often been associated with a lower level of job stability, characterised by job insecurity and involuntary reductions in working hours.

Figure 2.46 illustrates the proportion of employees with a non-permanent job contract as a percentage of total employees. A temporary contract generally indicates job instability and insecurity. The CE countries are characterised by varying levels of limited-duration contracts. Of the CE countries, Poland has the highest share: approximately every fourth employee has a non-permanent contract; it is followed by Croatia (more than 20%) and Slovenia (more than 15%). Italy and Germany are close to the EU-28 average of slightly under 15%, while the other CE countries, Slovakia, the Czech Republic, Hungary and Austria have figures of below 10%. In these countries, the share of employees with limited-duration contracts is therefore around 5 percentage points lower than the EU-28 average.

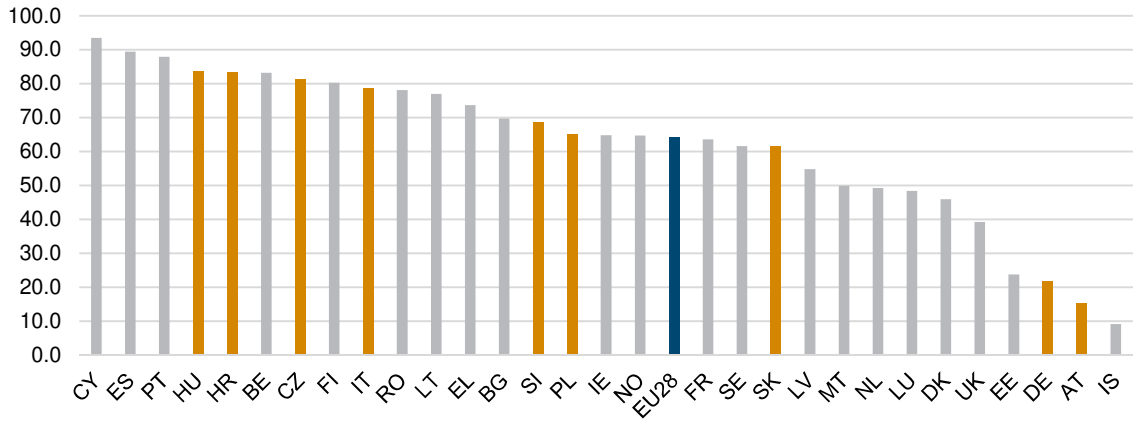
Figure 2.46 / Employees with limited-duration contracts, as % of total employees (2016)



Note: Blue line indicates CE territory
Source: Eurostat.

Figure 2.47 / Share of involuntarily temporarily employed individuals (25-64),

% of total temporarily employed individuals (2016)



Source: Eurostat.

In addition, Figure 2.47 sheds light on the proportion of individuals who are temporarily employed, although they want to find a permanent job, as a percentage of all employees with a temporary job and aged 25-64. In most CE countries, the share of involuntarily temporarily employed individuals is above the EU-28 average of around 60%. Austria and Germany show the lowest share of involuntarily temporary employees, also compared to other European countries.

TNC policy options

With respect to fair working conditions, the EU suggests encouraging entrepreneurship and self-employment. In this regard, some Interreg cooperation has already been undertaken. For instance, the Interreg CE project CERIecon[252] provides a mix of financial and non-financial support to assist entrepreneurs in setting up new firms; a package of strategies, action plans, pilot actions and training improves entrepreneurial competence and encourages innovation. Another example is the Interreg CE project ENTER-transfer,[253] which aims to facilitate business succession at the national and cross-national levels. Together, partners develop innovative tools and services for business succession to establish a sustainable family-business economy. For example, the project will create a portal that allows a match to be found between succession-seeking companies and succession seekers.

The knowledge and know-how of successful entrepreneurs in CE countries should be used and made accessible to other potential entrepreneurs. Best practices could be collected and discussed in a cross-country network, where the experience of those who have already succeeded at running their own business could be used. Moreover, a network could be the basis to coordinate business cooperation both within and across CE countries.

[252] http://www.interreg-central.eu/Content.Node/CERIecon.html

[253] http://www.interreg-central.eu/Content.Node/ENTER-transfer.html

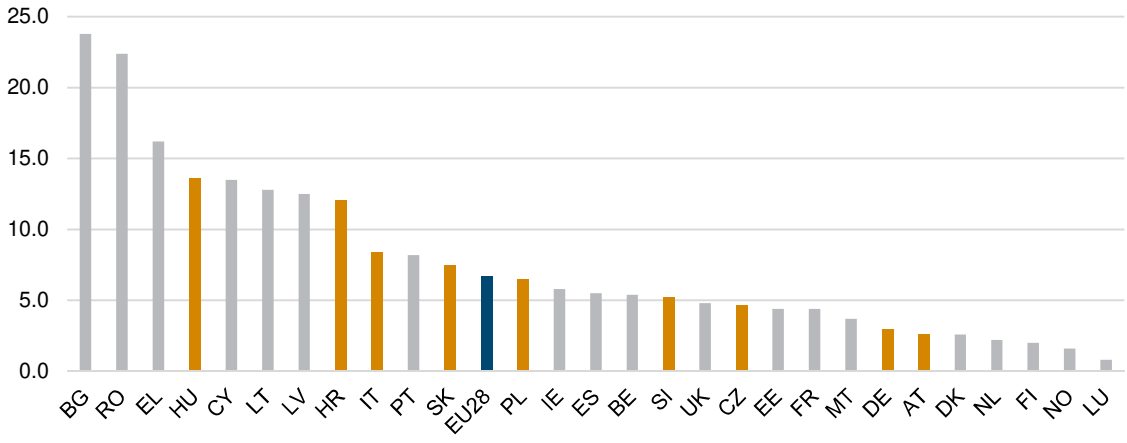
2.9.2.3. Social protection and inclusion

Description

A well-functioning society is characterised by a certain level of social protection and the inclusion of all its members. Income poverty is associated with a lack of material and non-material resources, which limits people's opportunity to participate in society. A reduction in poverty and in the number of people at risk of poverty and social exclusion constitutes a key target in the Europe 2020 strategy. Moreover, social protection and inclusion also encompass adequate access to essential services of good quality.

The core indicators to measure poverty and social exclusion are the share of people suffering from severe material deprivation[254] and the share of people at risk of poverty.[255] Figure 2.48 illustrates the share of people whose living conditions are constrained by a lack of resources and who are thus materially deprived. The CE countries show a heterogeneous pattern in this respect, with Hungary and Croatia having the highest shares of people with severe material deprivation (above 10%). Also Italy and Slovakia reveal a share that is well above the EU-28 average. The countries with the lowest shares are the more developed countries, including Germany and Austria, with shares of around 2.5%. Outside CE, the countries with the highest shares are Bulgaria and Romania, with levels close to 25%.

Figure 2.48 / Severe material deprivation, in % (2016)



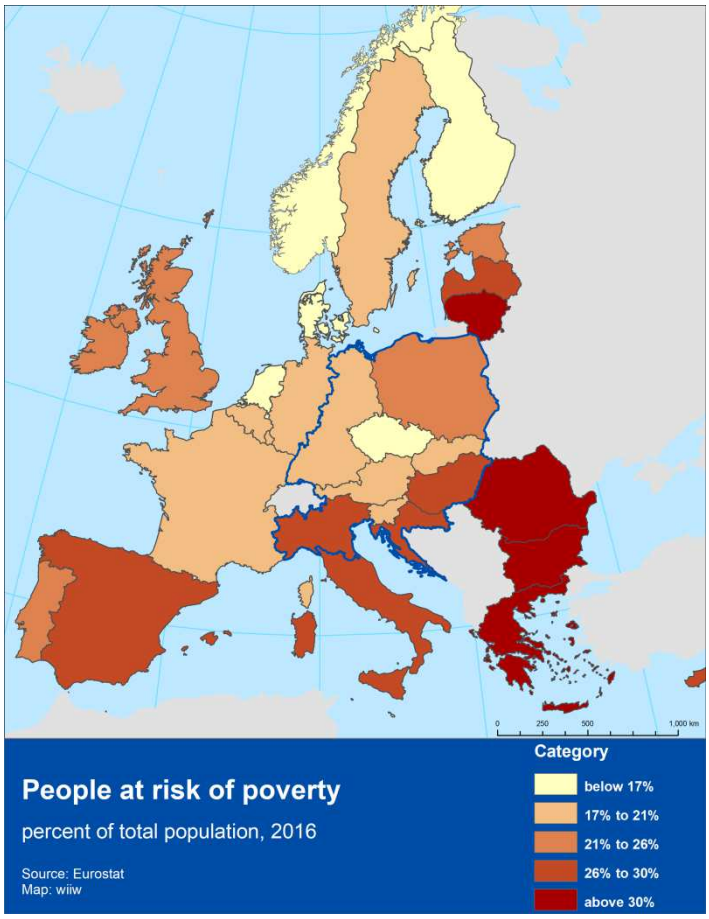
Source: Eurostat.

Furthermore, Figure 2.49 shows groups of individuals that are vulnerable and potentially excluded from the labour market. There are larger proportions of individuals at risk of poverty in Italy, Croatia and Hungary. Thus, in the CE countries there still exists a group of individuals who are not able to cover their basic needs, are constrained by a lack of financial resources and are lagging behind.

[254] Material deprivation refers to constrained living conditions. That is, when an individual 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.

[255] Defined as the proportion of persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income.

Figure 2.49 / People at risk of poverty, in % (2016)



Note: Blue line indicates CE territory
Source: Eurostat.

In addition, social protection and inclusion are also related to access to essential services of adequate quality. Such essential services also cover the supply of a suitable childcare system. Figure 2.50 shows the share of children in formal childcare.[256] All CE countries show a share below the EU-28 average of around 15%. Although Austria, Italy and Germany are close to the EU-28 average, the other CE countries are well below, with shares of under 5%. This indicates a potential shortage in the supply of an essential social service.

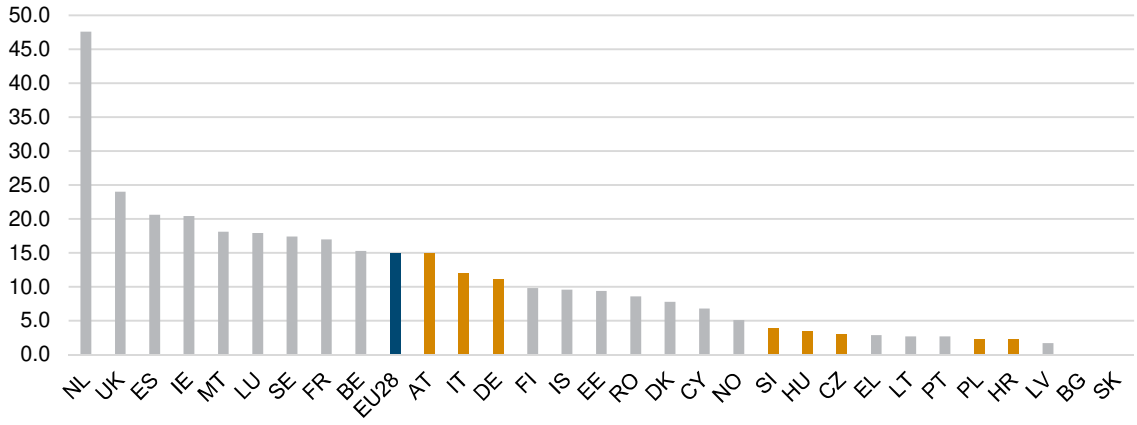
TNC policy options

One option for cross-country cooperation in the area of social protection and inclusion is the establishment of a network to discuss and exchange ideas and best practice. Such a network further allows pilot actions to be coordinated and implemented and helps to identify potential fields of services for further transnational cooperation and piloting.

[256] Privately and publicly provided.

For example, the Interreg CE project INTENT[257] aims to create a better common understanding of patient-centred cancer care and to develop common solutions to improve cancer care in CE countries. The project will provide an online benchmarking tool, define priorities for improvements to the existing system and establish a transnational know-how network. Moreover, the Interreg CE project digitalLIFE4CE[258] aims to improve collaboration between local stakeholders in seven CE countries on solutions for digital integrated health systems. The project will identify and promote best practice and foster innovation in digital healthcare systems.

Figure 2.50 / Share of children (aged less than 3 years) in formal childcare (1-29 hours), as % of total children (aged less than 3 years) (2016)



Source: Eurostat.

2.9.2.4. Summary

Although action on poverty, social exclusion and protection has been undertaken within the framework of the European Social Fund, it has not focused on TNC. The analysis above has highlighted some opportunities for TNC to reduce social risks in the CE countries. Interreg CE projects on equal opportunities, working conditions, and social protection and inclusion have already been launched. The projects principally aim to exchange ideas and create common ways to solve social risk issues, but also to initiate activities together and to facilitate business cooperation across CE countries.

The introduction of the European Pillar of Social Rights underlines the importance of the social dimension in EU policy. TNC can contribute to apply best practice, to work together on common issues and to establish networks for collaboration in the future. TNC can help to strengthen local economies and regions, and thus reduce regional inequalities within and across CE countries and foster social cohesion. Moreover, TNC can contribute to the creation of a sense of common belonging, since common issues are discussed and approached together.

[257] http://www.interreg-central.eu/Content.Node/INTENT.html

[258] http://www.interreg-central.eu/Content.Node/digitalLIFE4CE.html

2.10. DEMOGRAPHIC CHANGE/MIGRATION

2.10.1. Demographic change/migration challenge

2.10.1.1. Definition of the challenge

Demographic change relates to a population's age structure and the way it adjusts to changes in living conditions and broadly understood societal norms. Changes in the composition of a society's age structure are largely driven by natural processes (births and deaths), but to some extent they also result from ongoing social shifts and evolving attitudes, as well as from material conditions and incentives that could be shaped by policies. It is important to note that demographic change itself feeds back into a number of essential societal and economic processes.

Demographic change is a multidimensional process that can be analysed qualitatively from various angles. Within demographic change, *population ageing* currently constitutes one important challenge, as it will determine the size of the working-age population and thus will set the limits on the supply of employable labour. In the longer run, the *natural population decline* following shrinking fertility rates is a second challenge within demographic change. This natural secular population decline is also a factor determining the size of the available labour force.[259]

Combined, the natural population decline and population ageing present a serious challenge to, for example, the future sustainability of public finances, as the social security and health service systems will have to meet the needs of a growing proportion of the older population in the context of a declining share of working-age population cohorts.[260] In the context of demographic change, *migration* (outward as well as inward) may be both an opportunity and a challenge. Inward migration may be an opportunity because it is likely to alleviate the problems of labour shortages, possibly emerging as the result of unfavourable trends in population ageing and the natural population decline. At the same time, the inclusion and integration of migrants presents a serious political, social and economic challenge. Outward migration from the regions affected by population ageing and/or natural population decline is likely to be a challenge rather than an opportunity.

2.10.1.2. Related EU policies

In its headline strategic document EU2020 strategy, the European Commission has identified active and healthy ageing as a major societal challenge common to all European countries. The challenges related to demographic change/migration are naturally hard to cope with directly, even at the national level – e.g. through policies aimed at raising fertility rates or extending the age of mandatory retirement. The EU-level policies that have addressed those challenges have so far been indirect. One of them has been implemented within a larger life-long learning programme known as the Grundtvig programme. Launched in 2000, Grundtvig 'aims to provide adults with more ways to improve their knowledge and skills, facilitate their personal development and boost their employment prospects. It also helps to tackle

[259] For instance, Fotakis and Peschner, 2015.

[260] EU Commission, 2015b. http://ec.europa.eu/economy_finance/publications/european_economy/2015/pdf/ee3_en.pdf

problems associated with Europe's ageing population.'[261] The EU's Seventh Framework Programme promoted various projects that focus on ICT applications to provide solutions for people with special needs – i.e. the use of ICT by older people.[262]

The OECD provides a more comprehensive list of areas for EU support for local and regional actors in active ageing projects.[263] The list contains about 30 items, among them 10 projects co-financed by Interreg IV(B and C), including the DART (Declining, Ageing and Regional Transformation) programme co-financed by Interreg IVC.

The projects listed in the above OECD publication are split into the following thematic groups:

- Projects promoting active ageing in employment
- Projects promoting active ageing in society
- Projects promoting healthy ageing and independent living
- Multi-thematic active ageing projects (including DART).

Demographic change in its entirety (not restricted solely to ageing) constitutes a major challenge not only for the European Union, but also on a global scale. However, the impacts of the challenge are expected to be particularly pronounced for the CE territory. The demographic profiles for the region are singularly unfavourable, and its sensitivity to the demographic change has been high, or very high.[264] The most recent statistical data and analyses available, such as those provided by the 2015 Eurostat Demography Report[265] or the most recent *wiiw Forecast Report*,[266] indicate that the demographic challenges will be of particular importance to the CE territory in the coming years.

The demographic challenge is illustrated in Figure 2.51, which shows Eurostat population projections from 2015 until 2081 for the nine Interreg CE countries. It indicates that all Interreg CE countries except Austria might suffer from population decline, which may be extreme in the cases of Poland and Croatia which could lose up to 25% of their 2015 population. The figure also indicates that in the short run countries other than Austria could see an increase in their population, mainly due to inward migration. In the longer run, though, the effect of low fertility outweighs that of positive inward migration, thus leading to a decline in total population.

Meeting the demographic change/migration challenge requires, first of all, public policy response at the national level. As far as the ageing challenge is concerned, the most important elements of the response in question include the policies aimed at extending the working life (e.g. through a higher mandatory retirement age and other conditions delaying voluntary retirement); vocational activation (also of the elderly); the provision of incentives for labour market participation by the elderly; and the provision of incentives for upgrading the skills of the elderly. Apart from these 'activation' policies, national-level

[261] http://ec.europa.eu/education/lifelong-learning-programme/doc86_en.htm

[262] http://cordis.europa.eu/fp7/ict/programme/challenge7-ageing_en.html

[263] OECD, 2013, pp. 141-143.

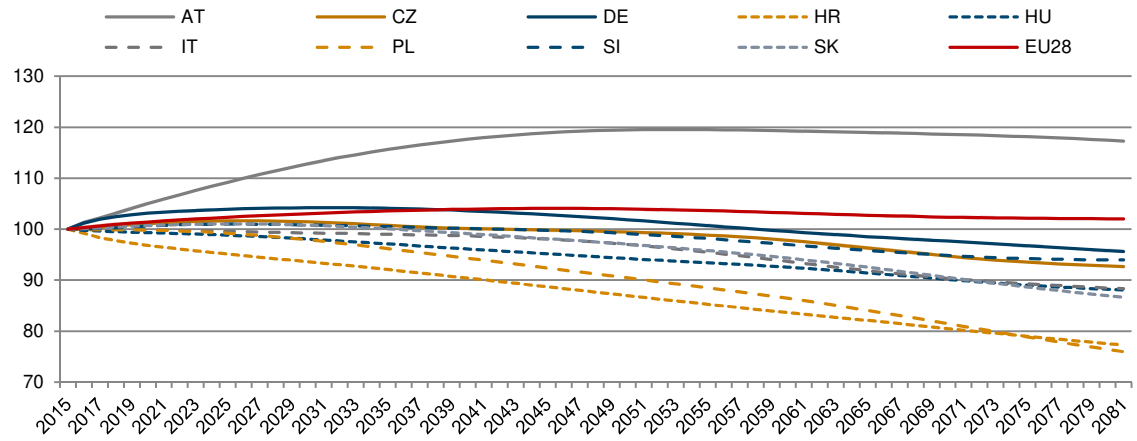
[264] DG Regio, 2008; 2009; 2011.

[265] http://ec.europa.eu/eurostat/web/products-statistical-books/-/KE-BM-15-003

[266] wiiw, 2018.

policy must take due consideration of the rising social assistance and health needs of the ageing population cohorts.

Figure 2.51 / Population projections 2015-2081, Interreg CE countries (Population 2015 = 100)



Source: Eurostat.

As far as the shrinking-population challenge is concerned, the most important elements of the policy response at the national level include actions which a) raise the employment rates; b) raise the efficiency and productivity of the labour force employed; c) stimulate desirable fertility developments.

The LEED project conducted by the OECD with the support of DG Employment, Social Affairs and Inclusion proposes five key guidelines/strategic priorities for addressing the challenges of demographic change at the regional level.[267] These strategic priorities include:

1. Designing strategic and localised solutions for territorial differences;
2. Implementing a place-based approach for resilient and inclusive communities;
3. Encouraging inter-generational solidarity for ageing societies and labour markets;
4. Creating dynamic and responsive labour markets that address demographic and economic transitions;
5. Generating innovative skills ecosystems.

2.10.2. Demographic change/migration – policy areas

The brief review of the demographic change/migration challenges presented above, as well as past attempts to define policies to tackle these challenges, suggests that there is still scope for the formulation and execution of actions to deal with the challenges. Clearly, these actions will primarily remain the responsibility of national governments.

Nonetheless, there is still some scope for action at the EU level – and also for TNC covering the nine countries included in the Interreg CE cooperation programme. The policy areas considered are:

[267] OECD, 2014, pp.16-20, http://oecd.org/cfe/leed/demographicchange.htm

1. Population ageing
2. Population shrinkage
3. Migration.

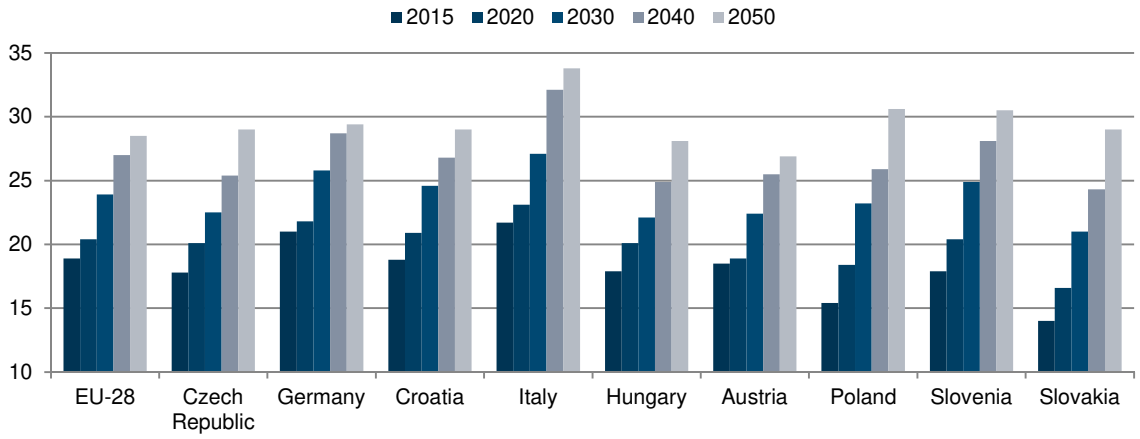
It is quite clear that the character of demographic change/migration challenges makes it very difficult to address them with head-on policies. Instead, the policies in the above three areas must attempt to minimise the unfavourable side-effects of the demography-related developments.

2.10.2.1. Population ageing

Directly, the main unfavourable consequences of population ageing include 1) decline in the supply of employable labour resources; 2) growing dependency rates, implying a higher fiscal burden on the working population and/or higher stress on the public finance system; 3) growing social and economic problems facing the older members of society. Potentially, the most serious negative indirect consequence of population ageing is the slowdown in economic growth following on from growing shortages of labour resources.

Figure 2.52 / Share of population aged 65 years and older in total population

population projections 2015-2050, in %



Source: Eurostat.

The challenge of population ageing is illustrated in Figure 2.52, which shows Eurostat projections for the share of the population aged 65 years or more up until the year 2050. These estimates indicate that in the EU as a whole, as well as in each individual CE country, the share of old people will increase significantly, given the low birth rates and still growing life expectancy. The ageing challenge is projected to be highest for Italy, where in 2050 around one third of the population will be 65 years or over (compared to 21.7% in 2015). Similarly, in Poland and Slovenia, the old-age share will surpass the 30% level in 2050, and thus will be higher than the EU average of 28.5%. In most other CE countries, ageing will develop approximately in line with the EU-28 average. An exception to this is Austria, where projections are a bit more optimistic, forecasting 'only' a 27% old-age share in 2050 (which is still 10 percentage points higher than in 2015).

Thus, ageing will be a major challenge for all EU countries, including the CE territory. The ways to neutralise the consequences of population ageing may include policies that accelerate overall productivity growth, slow down effective age-related professional inactivity, support the acquisition of new skills and competencies by the elderly and improve their health conditions, etc.

TNC policy options

Integration and functional relationship are not major issues in arguing for TNC policy to address the ageing challenge. Integration, especially in economic terms, is likely to proceed independently of this challenge, while it is also difficult to see how ageing could affect functional relationships in the CE territory, such as cooperation between all types of institutions, the exchange of knowledge, the movement of people, factors of production, etc. Also, ageing is not a challenge that is specific to the CE territory alone.

The main argument for TNC policy being important to tackle the challenge is the size of the problem. Given the forecasts, the expected negative effects of population ageing on the economies and the social systems of the CE countries are going to be large, necessitating equally large adjustments to at least maintain the present standards of living. Hence, to tackle this challenge, all possible policy tools (European, national and transnational) need to be used. Here, TNC complements very well other, mostly national policies, such as those initiated by the European Social Fund, as it allows learning from the experiences of other countries that face the same problem. Also, to some extent TNC also pools the resources of various countries, making tackling the challenge more efficient for each of the participating countries.

The following example shows that TNC has a large potential to address the population ageing challenge.

Although an interregional project, DART (Interreg IVC) provides an approach to meeting the ageing challenge that could be updated and developed further, so as to take account of the new trends emerging since its completion. DART focused on the identification and dissemination of good practice, with a view to maintaining the quality of life in regions with declining and ageing populations, especially in the new business ideas for SMEs, education and life-long learning; these strengthen the economy and also deal with educational, healthcare and social services across various regions.

Similarly, the Interreg Europe project TITTAN (Network for Technology, Innovation and Translation in Ageing) may serve as another prototype for a policy-support project to tackle the challenges facing the CE territory. It focuses on the exchange, benchmarking and implementing of good practices and measures in policies that can foster the design, up-take and use of innovative technology-based products/solutions in relation to healthy and active ageing. ITHACA (also an Interreg Europe project) is another current project focusing on the development and dissemination of good practices in smart health and care innovation, with a view to improving the active and healthy ageing of the population (see also the Interreg Europe HELIUM (Health Innovation Experimental Landscape through Policy Improvement) project).

Within Interreg CE 2007-2013, prime examples of how TNC can address the common challenge of population ageing include: a) Q-AGEING, which focuses on increasing the participation of older people in community work and the labour market, b) the CE-Ageing Platform, which supports the improvement

of framework conditions by adapting policies, governance processes and mechanisms to demographic change, c) HELPS, which develops innovative housing and care solutions for elderly people and d) Senior Capital, which develops knowledge and enlarges the quality workforce of the elderly.

To conclude, the ageing population challenge could be addressed by policy actions to be formulated and implemented under the Interreg CE Programme. These policy options may innovatively build on a number of past and current projects.

In addition, the ageing challenge could be indirectly tackled within the Interreg CE projects dealing with other challenges/policy areas. Within the employment/skills challenge, these are the policy areas 'skill upgrading' and 'life-long learning'; within the social risks challenge it would be the 'risk of poverty' policy area; and within the digital economy challenge it is the 'digital literacy and skills' policy area.

2.10.2.2. Population shrinkage

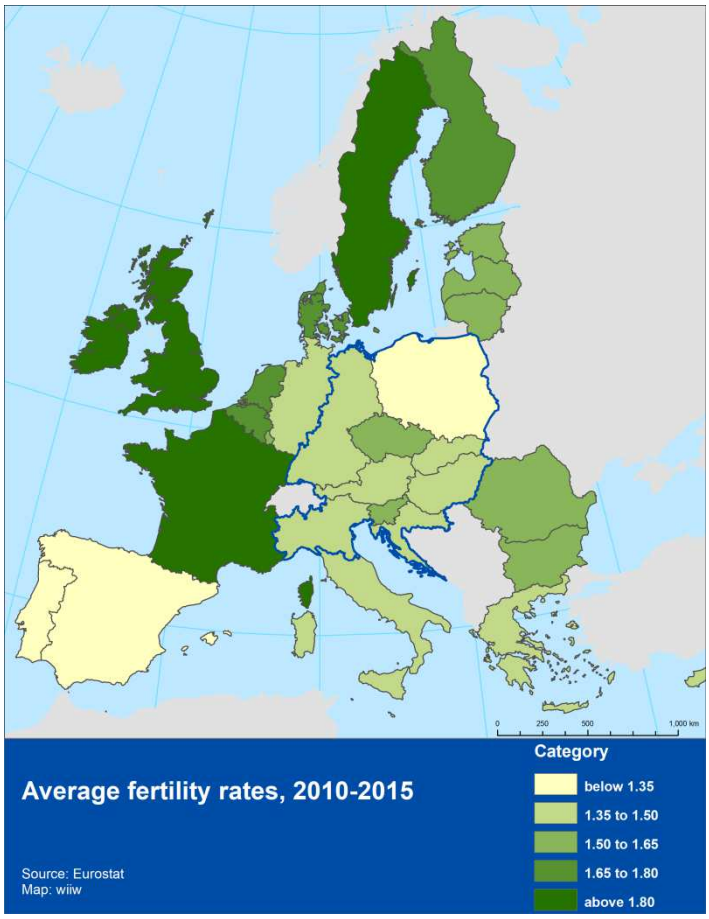
Directly, the main potentially unfavourable consequences of population shrinkage include 1) decline in the supply of employable labour resources and 2) growing dependency rates, implying a higher fiscal burden on the working population and/or higher stress on the public finance system. Potentially, the most serious negative indirect consequence of population shrinkage is the slowdown of economic growth following on from growing shortages of labour resources. Population shrinkage also challenges the provision of adequate, high-quality public services in declining regions. This can affect a multitude of services, such as public transport, municipal services, schools and childcare, and also medical services etc.

The problem of population shrinkage is illustrated in Figure 2.53 above. The main reason for the decline in population in almost all CE countries is the particularly low fertility rate.[268] Figure 2.53 shows that in all EU countries fertility rates are below the benchmark of 2.1 children per woman that would ensure a broadly stable population (in the absence of migration and with stable mortality). All CE countries have fertility rates below the EU average and are generally to be found among the countries with particularly low fertility rates. This is especially the case in Poland, Hungary, Italy and Slovakia, where on average only 1.4 children or less are born to each woman.

The primary way to deal with the above consequences of population shrinkage includes policies that accelerate overall productivity growth. Apart from this, policies whose aim it is to slow down effective age-related professional inactivity, support the acquisition of new skills and competencies by the elderly, improve their health conditions etc. may play a subsidiary role (see 2.11.2.1 above).

[268] The fertility rate (in a specific year) is defined as the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in alignment with the prevailing age-specific fertility rates. Assuming no net migration and unchanged mortality, a total fertility rate of 2.1 children per woman ensures a broadly stable population. OECD, https://data.oecd.org/pop/fertility-rates.htm

Figure 2.53 / Average fertility rates, 2010-2015



Note: Blue line indicates CE territory
Source: Eurostat.

TNC policy options

As with ageing, the main motivation for addressing population shrinkage via TNC policy is that it is a problem common to all CE countries. With the exchange of knowledge and best practice, as well as with the pooling of financial, administrative, policy and knowledge resources, TNC can contribute to tackling this challenge. Although it is questionable whether TNC can stop population shrinkage, it can help mitigate the negative effects, as the examples from the 2007-2013 CE Programme show. Thus, ADAPT2DC developed transnational strategies in the field of public infrastructure and services that were supposed to reduce the maintenance and provision cost in regions and cities with shrinking populations. Likewise, EURUFU aimed at creating a tool for rural regions to identify innovative solutions for sustainable public supply in regions with a shrinking population.

The YURA project focused on a) a reduction in the negative impact of demographic and social change in rural regions by developing and implementing transnational strategies to improve the regions' attractiveness and competitiveness, b) the adaptation and improvement of social infrastructure, c) the improvement of human capital and social integration and d) the initiation of transnational knowledge

transfer. Finally, QUALIST focused on developing and testing innovative concepts to increase the attractiveness of small towns, in order to stabilise their population.

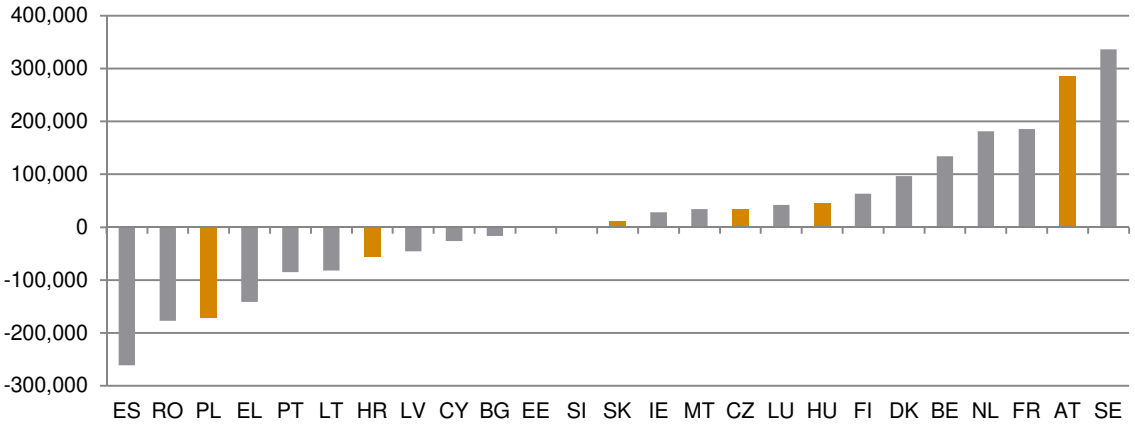
Additionally, TNC could contribute to meeting the challenge of population shrinkage through projects concerned with promoting productivity growth, which is the central policy area of the globalisation/competitiveness challenge.

2.10.2.3. Migration

Migration (outward as well as inward) may provide an opportunity, as well as a challenge. Inward migration may be an opportunity because it is likely to alleviate the problems of labour shortages that may emerge as a result of population ageing and natural population decline. At the same time, the inclusion and integration of migrants could pose a serious political, social and economic challenge. Outward migration from the regions, which are already strongly affected by population ageing and/or natural population decline, is likely to be a challenge rather than an opportunity. In addition, outward migration may result in 'brain drain' to the detriment of less-prosperous regions.

Figure 2.54 / Net migration to or from EU countries

absolute number of net migrants in the period 2013-2016



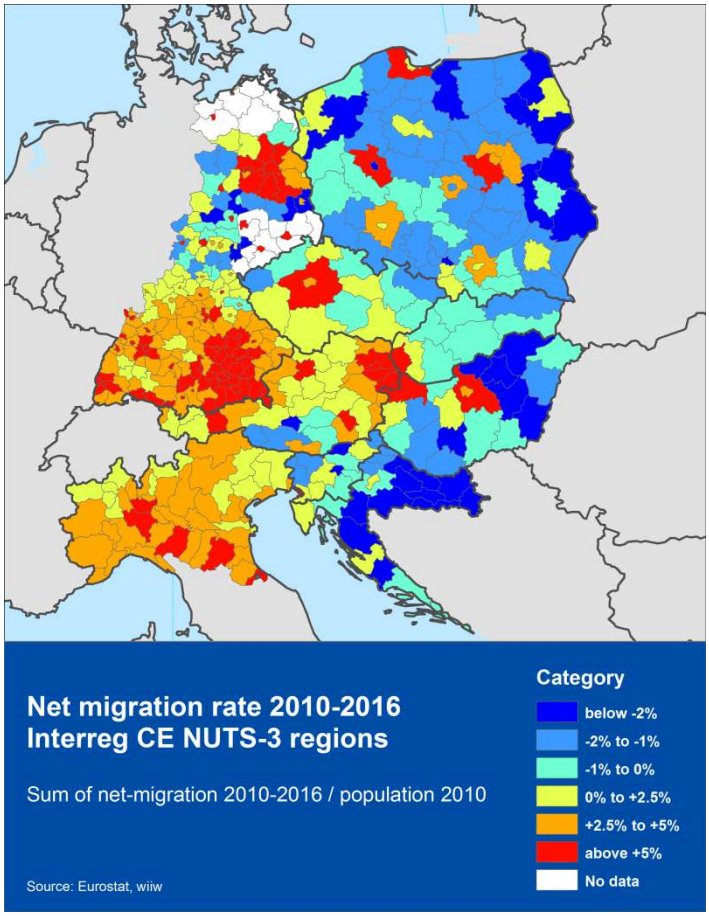
Note. Germany and Italy are not included because of their immigration goes beyond the scale of the figure. Germany: 2.7 million immigrants and Italy 600 thousand immigrants from 2013-2016.
Source: Eurostat, own calculations.

Looking first at net migration – i.e. the difference between the number of people immigrating to and emigrating from a country – the EU had a net inflow of around 4.8 million people in the period 2013-2016 (i.e. less than 1% of total EU population). The main receiving countries were Germany (net inflow of 2.7 million people), the UK (net inflow of 1.1 million people) and Italy (net inflow of 600,000 people). The net inflows for all other EU countries are shown in Figure 2.54. It shows that of the CE countries, only Poland and Croatia are net emigration countries: in the period 2013-2016, the net outflow from Poland was 170,000 people and from Croatia – 55,000 people. In all other CE countries, net migration numbers were positive, especially in Austria, with around 285,000 net immigrants in the period 2013-2016. In

other CE countries, net immigration was much lower: 45,000 in Hungary, 35,000 in the Czech Republic, 11,000 in Slovakia and 1,000 in Slovenia.

The situation at the regional level is illustrated in Figure 2.55, which shows the net migration rate for each Interreg CE NUTS-3 region, i.e. the net migration to or from a region in the period from 2010 to 2016, divided by that region's population in 2010. It shows two main trends: a) partly massive emigration from less-prosperous regions in the Interreg CE countries and b) large immigration into economically well-developed urban regions, including their neighbouring regions.

Figure 2.55 / Net migration rate in Interreg CE NUTS-3 regions, 2010-2016



Source: Eurostat, wiiw.

To identify the migration-related challenges in a bit more detail, it is necessary to differentiate population movements by their origin or destination countries. This is done in Figure 2.56, showing the share of migrants from the EU and non-EU countries to the CE countries. Additionally, Figure 2.57 shows the share of emigrants from the CE countries to EU and non-EU countries.[269] The figures suggest that migration issues tend to be different across countries. Especially immigration to Italy and Germany seems to be heavily affected by events outside the EU (e.g. the Syrian conflict, migration waves from Africa), given the high share of immigrants from non-EU countries. In Austria, this issue is also

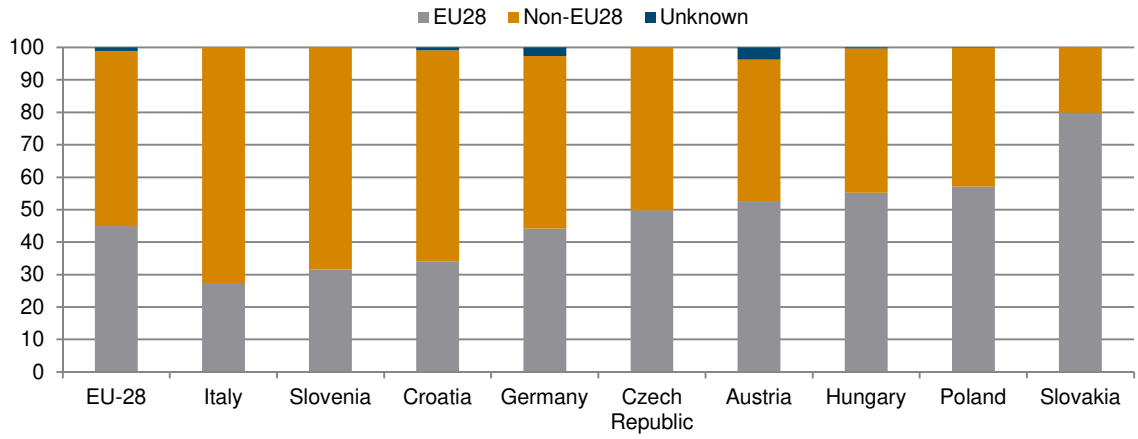
[269] The available data from Eurostat do not allow for a more detailed description of migration flows.

noticeable (given the large net inward migration, see above), though overall it has more immigrants from EU countries than from non-EU countries.

In the other CE countries, absolute and net immigration is relatively low and thus a less pressing problem. Still, it is interesting to observe that Slovenia and Croatia have a much higher share of non-EU immigrants than do Hungary, Poland or Slovakia.

Figure 2.56 / Immigration from EU-28 and non-EU countries to the CE territory

as % of total immigration

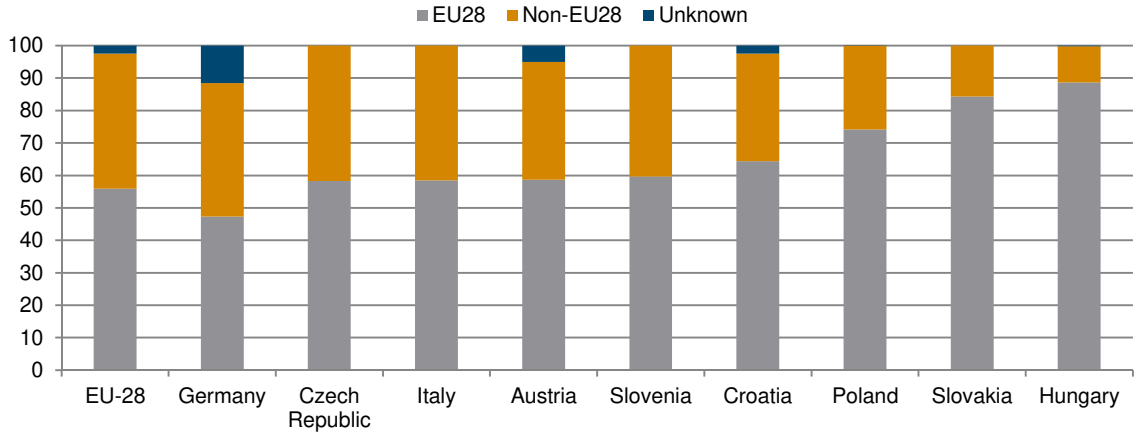


Source: Eurostat.

As far as emigration from CE countries is concerned, the analysis above has shown that in absolute terms it is only a problem for Poland and Croatia. For those countries, it can safely be assumed that the negative migration balance is strongly related to the 'brain drain'. For other countries, such an assumption cannot easily be made. Looking at the emigration patterns (Figure 2.57), 75% or more of Polish, Slovak and Hungarian migrants go to other EU countries. In other CE countries, the EU-28 is also the most important destination of migration, albeit to a much lesser extent. The geographical proximity of the destinations could suggest that emigration from Slovakia, Hungary and even Poland is more of a temporary nature than emigration from other CE countries.

Figure 2.57 / Emigration from CE countries to EU-28 and non-EU countries

as % of total migration



Source: Eurostat.

TNC policy options

In the past, migration has not been a priority topic for Interreg in general or for Interreg CE in particular; only recent events have made it a thematic focus in the call for projects. Nonetheless, migration has become a major issue, whose importance for the CE territory may even grow in the future. Given this, migration must not be lost from the policy radar at Interreg CE. A worthwhile option for TNC could involve the formulation and implementation of projects whose aim it would be to learn from the national and regional (NUTS-level) experiences with respect to the management of migration flows (both inflows and outflows) across the CE territory. This should lead to the identification of the most problematic issues, such as the integration of immigrants from non-EU countries and the best practices to cope with them. An example of this is the CE 2007-2013 Re-Turn project, which focused on developing, testing and implementing new support policies, tools and services to promote return migration in CE regions.

2.10.3. Summary

The analysis has brought up a number of policy areas where TNC could contribute effectively to strengthening the response to the demographic change/migration challenge in the EU and especially in the CE territory. Thus, the majority of the issues analysed were already part of the 2007-2013 Interreg CE Programme in the form of Area of Intervention 4.2 'Addressing the Territorial Effects of Demographic and Social Change on Urban and Regional Development'.[270] As has been shown, the inclusion of this in the programme has led to a number of projects dealing with the demographic challenge.

Also, the demographic challenge features in the current Interreg CE Programme, notably under Specific Objective 1.2 'Improve skills and entrepreneurial competences'; among other things, that aims at

[270] http://www.central2013.eu

improving ‘the capacities of regions to manage new challenges such as those deriving from demographic change, migration and brain drain’.[271]

Given the importance of demographic change/migration challenge, it is recommended that it should remain one of the dimensions of a future Interreg CE Programme. The past and current solution to make the challenge part of more general priorities seems to be a good approach in this respect. Nevertheless, it also needs to be considered that demographic change is of a multidimensional nature, and thus is affected by other policies (e.g. regional development policies) and developments in other areas (e.g. globalisation, transport infrastructure). Therefore, it might be useful to connect demographic change to other relevant policy areas more strongly in the future.

[271] http://www.interreg-central.eu/Content.Node/SO1.2.html

2.11. GOVERNANCE

2.11.1. Governance challenge

The challenge of cooperating across borders in Central Europe is a fundamental governance challenge. Countries with different governance cultures and institutional settings on both sides of the former 'Iron Curtain' meet in a common European Community region. Several levels of ongoing cooperation projects were set up in the post-1989 era, covering various groups of countries in the region. Countries and various other administrative bodies cooperate in Central Europe on the basis of proximity and joint interests. Some cooperation platforms were established right after the fall of the 'Iron Curtain'; others became effective after accession to the European Union.

The Central European Initiative (CEI), established in 1989, was the first regional intergovernmental forum committed to supporting European integration through cooperation between and among its member states and with the EU, other interested public institutions, private and non-governmental organisations, as well as international and regional organisations. In order to offer a solid contribution to European integration, the CEI combines multilateral diplomacy and project management, both as a donor and as a recipient, while also bridging European macro-regions.[272]

Established in 1991, the Visegrád Group (V4) – comprising the Czech Republic, Hungary, Poland and Slovakia – is a vital organisation in the eastern part of Central Europe. The backbone of this cooperation consists of mutual contacts at all levels: from the highest-level political summits to expert and diplomatic meetings, and covering the activities of non-governmental associations, think-tanks and research bodies, cultural institutions and numerous networks of individuals. The V4 was a vehicle of EU and NATO accession, and remains an important network to support the joint interests of its members in the EU. Currently the V4 are engaged in maintaining the scope and funding of the Multiannual Financial Framework and supporting the programmes under European Territorial Cooperation (ETC).[273]

Cooperation between regions is a major way of implementing EU policies in various areas. Macro-regional strategies stretch beyond EU borders and foster regional cooperation between groups of countries in the same geographical area. Regions covered by the Interreg CENTRAL EUROPE Cooperation Programme participate in all four existing Macro-regional strategies, covering the Danube Region (EUSDR), the Baltic Sea Region (EUSBSR), the Alpine Region (EUSALP) and the Adriatic and Ionian Region (EUSAIR).

ETC (or Interreg) is a framework for the implementation of joint actions and policy exchanges between national, regional and local actors from different Member States. The overarching objective of ETC is to promote a harmonious economic, social and territorial development of the Union as a whole. Territorial cooperation is organised along three lines of cooperation: cross-border, transnational and interregional, all of which have several programmes, related organisational structures and governance procedures.

Participation in and coordination between territorial programmes is facilitated by the European Grouping of Territorial Cooperation (EGTC), which is a European legal instrument designed to facilitate and

[272] http://www.cei.int

[273] http://www.visegradgroup.eu/calendar/2018/joint-statement-of-the-180329

promote cross-border, transnational and interregional cooperation. EGTC allows public entities of different EU Member States to come together under a new entity with full legal personality. It is designed to facilitate and promote territorial cooperation, with a view to strengthening the economic and social cohesion of the European Union. Through the coordination of the European Committee of the Regions, the EGTC Platform integrates the political and technical representatives of all existing EGTCs.

The Cohesion Report 2017[274] defines high-quality institutions as those which 'feature an absence of corruption, a workable approach to competition and procurement policy, an effective legal environment, and an independent and efficient judicial system, strong institutional and administrative capacity, reducing the administrative burden and improving the quality of legislation'. It identifies the main findings of previous research on why good governance matters for regional growth, of which the following statements are of primary importance for Central European integration:

- There is substantial evidence that the quality of government matters for social and economic development across the EU and that it is an important determinant of regional growth.
- The way that national regulations are implemented and their effect on development varies within countries, reflecting differences in the efficiency of regional and local authorities.
- Institutional capacity affects the attainment of long-term policy objectives and the ability to implement structural reforms which have the potential to boost growth and employment.
- The perception of corruption remains widespread in a number of EU Member States, which erodes trust in governments and their policies. The degree to which meritocracy (rather than nepotism) is a feature of the public sector varies greatly between and within EU countries.

The role of regional governance in implementing EU policies has been identified in several EU surveys at both the national and the regional level. The Lagging Regions Report[275] points out that the quality of government and institutions appears to be the main obstacle to development in regions with persistently low growth rates. Investments in administrative capacity building have increased in the 2014-2020 financing period. A set of ex-ante conditions linked to good governance and administrative capacity are to be fulfilled before grants can be received. With a focus on sound governance, conditionalities can help to improve public administration.

The impact of EU policies on national governance is mainly indirect, however. The size, structure and scope of public institutions are unique to each country, and their architecture and organisation are under national competence. EU-level support for improving governance in Member States is provided by a comprehensive handbook on how to assess and improve the quality of governance.[276] This toolbox on public administration aims to support institutions that want to modernise public administrations. It is intended as a reference and resource pointing to existing EU policies and international practices, illustrated by case studies. Despite much accumulated knowledge of how to administer the challenges of good governance, little or no improvement has been recorded in related policy areas, unfortunately. As pointed out further below, the challenge of governance has even aggravated in some policy areas in several countries and regions of the Interreg CE Programme.

[274] EU Commission, 2017c.

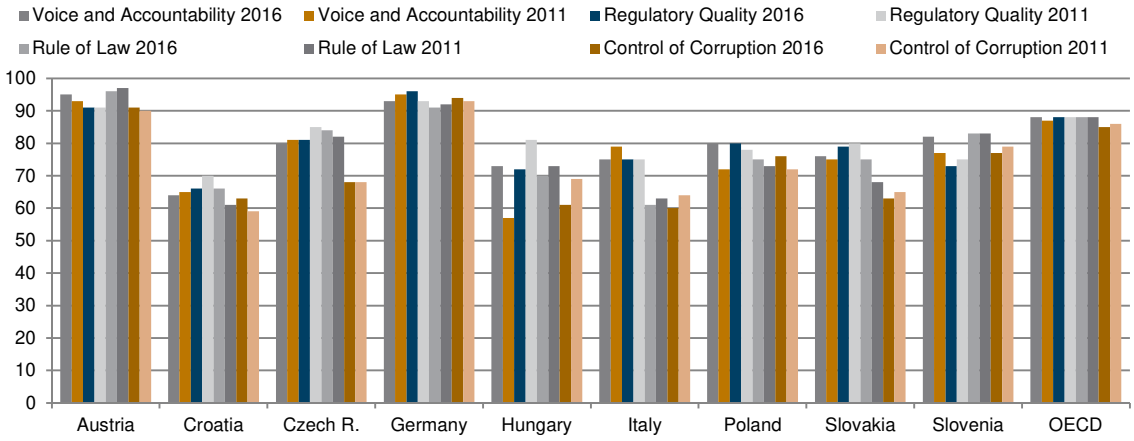
[275] DG Regio, 2017e.

[276] European Commission, 2017f.

2.11.2. Governance – policy areas

Good governance comprises a broad set of interrelated challenges, which need a complex policy approach. Measuring the quality of governance has been done by various instruments, which apply wide sets of indicators and different fragmentation of the policy issues. A common feature is that fact-based measurement is not possible, and thus indicators rely mainly on surveys and expert opinions. Two international comparisons are taken here to identify the most important policy areas: the Worldwide Governance Indicators and the European Quality of Government Index.

Figure 2.58 / Worldwide Governance Indicators (WGI), percentile rank (0-100)



Note: Indicates the rank of a country among all countries in the world: 0 corresponds to the lowest rank and 100 corresponds to the highest rank.
Source: http://info.worldbank.org/governance/wgi/#reports

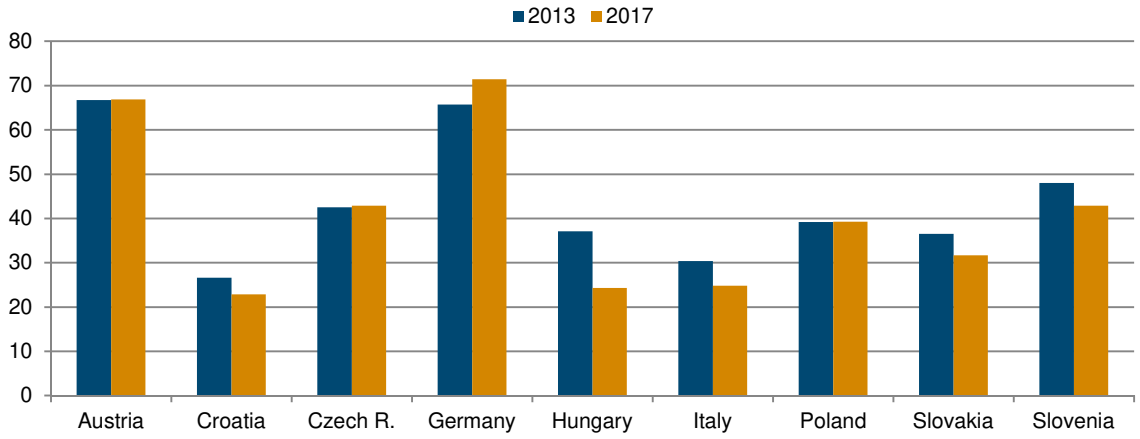
The Worldwide Governance Indicators (WGI) project of the World Bank reports aggregate individual governance indicators for over 200 countries and territories over the period 1996-2016 for six dimensions of governance: voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption. The four of them shown in Figure 2.58 are the most relevant indicators for Interreg CE countries, as they create the immediate environment for policy implementation. One of the indicators, regulatory quality, will be discussed as policy area 1, while the other indicators will be dealt with as part of the European Quality of Government Regional Index under policy area 2 (integrity). Policy area 3 addresses corruption.

Among CE countries, Germany[277] and Austria stand out in terms of all four WGI indicators, with ranks above the OECD average. All other countries ranked below the OECD average, with Slovenia and the Czech Republic having somewhat better rankings than the rest of the countries. Control of corruption is identified as the most problematic of the governance challenges in Interreg CE countries. Besides, the trend over time is not advantageous in some countries: comparing 2016 with 2011, there are more areas of governance in Hungary and Italy which recorded a deterioration than registered an improvement; the rankings by rule of law and control of corruption declined in both countries.

[277] Interreg CENTRAL EUROPE does not include the whole territory of Germany and Italy, thus WGI ranks serve only as proxies for the relevant parts of the two countries.

The European Quality of Government Index (EQI) by regions builds on WGI indicators and combines those with the results of survey data at the regional level.[278] The survey aims at capturing average citizens' perceptions and experiences of governance and corruption, and the extent to which they rate their public services as impartial and of good quality in their region of residence. In building the regional index, 16 questions/indicators were aggregated to three pillars, based on factor analyses labelled 'quality', 'impartiality' and 'corruption'. As a next step, these three pillars were averaged together to form the final index for each region. Figure 2.58 demonstrates that the quality of governance diverged in the CE countries in 2013 and 2017 in a way similar to that found by the WGI. Detailed data for individual governance areas show a similar picture as well, though corruption stands out as the most pressing problem.

Figure 2.59 / European Quality of Government Index normalised 0-100, 2013 and 2017



Source: https://qog.pol.gu.se/data/datadownloads/qog-eqi-data

The most important policy areas identified on the basis of the above two sources are as follows: (1) the quality of regulation which is behind the other features and functions, and serves as the starting point for the analysis, (2) impartiality and (3) control of corruption, both showing a high diversity among CE regions.

2.11.2.1. Policy area 1: regulatory quality

Description

Regulatory quality captures the ability of a government to formulate and implement sound policies and regulations that permit and promote private sector development. A wide set of data is used by the World Bank to measure the quality of regulatory governance.[279] The indicators explore how governments interact with the public when shaping regulations; they assess how interested groups learn about new regulations being considered, and the extent to which they are able to engage with officials on the content; they also measure whether or not governments assess the possible impact of new regulations in their countries and whether those calculations form part of the public consultation. Finally, Global

[278] Charron et al., 2012. Data access: https://qog.pol.gu.se/data/datadownloads/qog-eqi-data

[279] http://rulemaking.worldbank.org

Indicators of Regulatory Governance capture the ability of stakeholders to challenge regulations, and the ability of people to access all the laws and regulations currently in force in one consolidated place. Table 2.3 depicts the results for the Interreg CE countries.

Table 2.3 / Scores of Global Indicators of Regulatory Governance (scale 0 to 1)

	Publication of proposed text	Conduct consultation	Report on results of the consultation results	Conduct impact assessment	Specialised body for impact assessment	Impact assessment made public	Consolidated regulatory governance score
Austria	1	1	1	1	1	1	6
Croatia	1	1	1	1	1	1	6
Czech R.	1	1	0	1	1	1	5
Germany	1	0.8	0.8	1	1	0.6	5.2
Hungary	1	1	1	1	0	1	5
Italy	1	0.8	0.8	1	1	1	5.6
Poland	1	0.2	1	1	1	1	5.2
Slovakia	1	1	1	1	0	0	4
Slovenia	1	1	0.2	1	1	0	4.2

Source: http://rulemaking.worldbank.org/

Regulatory governance receives fairly high scores for the Interreg CE countries. Differences in this area are smaller than those for the other relevant policy areas, impartiality and corruption. Austria and Croatia have the highest scores, Slovakia and Slovenia the lowest. This partly contradicts the findings of EQI because of the different methodologies used: the World Bank indicator measures the existence of institutions and procedures, while EQI relies more on qualitative assessments and personal perceptions. As for the individual areas of regulatory governance reported in the World Bank indicator, all governments publish legal texts and conduct impact assessments. Differences relate mainly to the existence of a special body to handle the impact assessments, and the publication of those assessments. Improvements are necessary in areas with the lowest scores: the relationship with stakeholders, the openness to consultations and the publication of the results of consultations.

TNC policy options

Although rule-making on governance is under national jurisdiction, certain codes of conduct can be imposed. The EU Commission's framework on good governance can be useful for all Member States: 'Better regulation sets out to ensure: decision making is open and transparent; citizens and stakeholders can contribute throughout the policy and law-making process; EU actions are based on evidence and understanding of the impacts; regulatory burdens on businesses, citizens or public administrations are kept to a minimum.'[280] Participants in Interreg CE projects are confronted with the practice of their governments and can point out regulatory inconsistences and speak up for reforms.

Interreg CE projects in various areas foster transnational cooperation, which allows the capacities of the public sector and related entities to be improved. For example, transparency of the regulatory framework and its reforms can be supported by e-governance. E-governance platforms provide up-to-date opportunities for conducting consultations and impact assessments. In general, TNC policies can

[280] https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how_en

enhance implementation of the eGovernment Action Plan.[281] Furthermore, the Interreg CE Peripheral Access project includes a work package on smart governance, designed to improve cooperation between policies, stakeholders, legal and institutional networks in support of the cross-border organisation and marketing of transport arrangements. The Specific Objectives 2.3 and 3.3 of the Interreg CE Programme aim to improve environmental management of functional urban areas and the governance of environmental management. Enhanced governance will contribute to better planning, management and decision making, thereby reducing usage conflicts.

2.11.2.2. Policy area 2: impartiality

Description

Impartiality means neutrality, independence and objectivity, fairness and balance, open-mindedness and even-handedness.[282] Impartiality is a procedural norm that affects not the content of specific policies, but rather the way in which power is exercised. Nor does it rule out preferential legal treatment for certain groups (such as minorities, SMEs, etc.). Besides, the absence of corruption does not preclude particularism.[283] Impartiality implies recruitment based on merit and competence, rather than on political connections or membership of clientele networks.

Impartiality is a basic ethical norm in the codes of conduct of public institutions, including the EU Commission. In practice, most threats to impartiality boil down to conflicts of interests. Policies have to deal with the following threats to impartiality among institutions and individuals:[284]

- Self-interest threat arises when an institution or person acts for his/her own benefit.
- Subjective threat arises out of personal subjective bias against established norms.
- Familiarity threat arises when a person is impeded in giving an impartial judgement on somebody he/she knows;
- Financial threat can be embedded in the incentive system of an institution if certain revenues are to be achieved.

TNC policy options

All bodies involved in TNC programmes are subject to the same code of conduct, including impartiality.

Integrity management consulting may be involved in project implementation to advise individuals and organisations on how to apply the highest ethical standards. Prudent and ethical decisions relating to finance, internal operations and interaction with the outside should be disseminated. All procedures must provide transparency, quality standards and quality control at all levels of operation. An example of this is the Interreg CE project ROSIE dealing with responsible innovation, ethics and good governance.

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281 https://ec.europa.eu/digital-single-market/en/european-egovernment-action-plan-2016-2020

282 Rothstein and Teorell, 2008.

283 Mungiu-Pippidi, 2006.

284 List based on the code of conduct of various certifying institutions.

2.11.2.3. Policy area 3: control of corruption

Description

Corruption is defined as an abuse of (public) power for private gain that hampers the public interest. Analysis by the ANTICORRP programme[285] shows a strong correlation between corruption and government overspending, undercollection of taxes, fiscal deficits and under-absorption of European structural and investment funds. It is also strongly associated with 'brain drain' from the corrupt economy to more meritocratic environments. There is no single set of causes of corruption and it is not at all inevitable. The risk of corruption tends to be higher in the presence of opportunity. Opportunity can arise from officials having discretion (uncontrolled decision-making power) plus privileged access to public resources. In this case, the absence of constraints, including ethical behaviour, weaknesses in law enforcement, sanctions and public opinion, increase the probability of power abuse.

Although no measurement of corruption is universally accepted, the most commonly accepted rely on surveys and a wide set of indicators while also using each other's results: the Corruption Perceptions Index (CPI) of Transparency International, the Control of Corruption Index of the World Bank and the indicator Irregular Pays and Bribes, a part of the Global Competitiveness Report.

Corruption has long been recognised and addressed by policy makers, but national policies have proved inadequate. This issue is also systematically addressed at a supranational level. The EU Anti-Corruption Report (2014) provided a clear picture of the situation and aimed at setting up a framework to facilitate the exchange of best practice and to stimulate peer learning and further compliance with EU and international commitments. There was also the intention of preparing the ground for future EU policy initiatives in the area of anti-corruption. However, some Member States were not interested in continuing this programme, and so the EU Commission has abandoned plans to publish a new report in 2017.[286] The Commission launched a softer anti-corruption experience-sharing programme in 2015 to encourage national authorities to better implement laws and policies against corruption.[287]

TNC policy options

The Quality of Public Administration Toolbox suggests that the anti-corruption strategy should be founded on understanding the risks to integrity and the characteristics of corruption, in order to help select the most suitable policy measures.[288] The problem of possible corrupt practices is addressed by anti-fraud measures and strict rules applied in the framework of the controls set up in Interreg cooperation programmes.

While the Managing Authority of Interreg CE has a zero-tolerance policy towards fraud and corruption, there is a need for awareness on the part of each project participant. Below-average EQI scores in some regions may indicate that participants from these regions come from an environment with a relatively elevated risk of corruption. For example, one of the two regions with the lowest EQI scores on the corruption dimension, Liguria, is involved in three Interreg CE projects, and the region with the second-

[285] Mungiu-Pippidi et al., 2017.

[286] https://euobserver.com/institutional/136775

[287] https://ec.europa.eu/home-affairs/what-we-do/policies/organized-crime-and-human-trafficking/corruption_en

[288] European Commission, 2017f.

lowest score, Közép-Magyarország (which includes the Hungarian capital Budapest) has 21 of the 57 Hungarian project participations. Good codes of conduct and a proper culture of interaction within cooperation projects can deal with the risk of corruption.

2.11.3. Summary

Cooperation in Central Europe has historically taken several forms, though these have mainly been confined to the government level. Business integration is also very advanced through production linkages and FDI, which spreads advanced governance standards. Cooperation between regions is a major way of implementing EU policies in various areas and geographic settings. Macro-regional strategies stretch beyond EU borders and foster regional cooperation between groups of countries in the same geographical area. Interreg CE Programme is a framework for the implementation of joint actions and policy exchanges between national, regional and local actors with overarching objectives.

Good public governance is a prerequisite for the efficient operation of TNC, as policies and projects involve central, regional and local government bodies as facilitating, participating and implementing agencies. In addition, several of the projects propose improvements in the governance of specific policy areas (such as energy efficiency, waste control, etc.) that must be integrated into policy reforms.

TNC contributes to strengthening public governance in the CE territory, cutting across the current Interreg CE Programme priorities and objectives and finding ways into each of them. Interreg CE projects address governance aspects mainly as a horizontal issue. They contribute to improving public governance by their internal structure and the way they are organised and controlled. However, public sector and other partners operate in a national and regional public governance environment, which is subject to the risks of bad governance, conflict of interest and corruption.

TNC programmes offer opportunity for improving the quality of governance (in particular multi-level governance in several sectors, which is an important aspect in many projects) and providing novel services to the public. Anti-corruption experience sharing[289] is part of the work in project networks. Innovative projects implemented under the Interreg CE Programme contribute to improving public governance in specific policy areas. As they operate transnationally, they transfer best practice and also introduce novel governance approaches which can be implemented on a wider scale. TNC policy links project participation of a region or country to efforts fighting corruption.

[289] https://ec.europa.eu/home-affairs/what-we-do/policies/organized-crime-and-human-trafficking/corruption/experience-sharing-programme_en

3. Impacts and results of the CE 2007-2013 Programme, outlook for the 2014-2020 programme, survey results and case studies

The analysis in Task 2 is split into five steps. The first step analyses the inputs, outputs, results and outreach of the CE 2007-2013 Programme in a quantitative manner, while the second step investigates the results and impact of the programme in a qualitative manner. Step 3 analyses the current Interreg CE Programme with respect to its main priorities and topics covered by the projects that have been approved so far. The fourth part shows the main results of a survey conducted among the beneficiaries in the CE 2007-2013 Programme, and the fifth part consists of 12 case study projects for a more detailed insight into the programmes' results and achievements.

3.1. QUANTITATIVE ANALYSIS OF INPUTS, OUTPUTS, RESULTS AND OUTREACH OF THE CE PROGRAMME 2007-2013

This part analyses the impacts and results of the CE 2007-2013 Programme using data on financial, output, results and communication indicators provided by the Managing Authority (MA)/Joint Technical Secretariat (JTS), as well as the information provided in the programme's final implementation[290] and evaluation[291] reports. Additionally, the analysis includes the findings of six thematic studies covering the programme's achievements in the areas: a) cultural heritage and creative resources,[292] b) energy efficiency and renewable energies,[293] c) technology transfer and business innovation,[294] d) sustainable public transport and logistics,[295] e) demographic change and knowledge development,[296] and f) environmental risk management and climate change.[297]

The analysis has a three-step structure:

- Step 1 – Analysis of inputs to the CE Programme: This step examines the financial allocations and expenditure made in the programme in total, as well as by priority axis, specific objectives and CE countries and regions.
- Step 2 – Analysis of the programme's outputs and results: This step evaluates the extent to which CE projects created both tangible and intangible products that strengthened economic and social development in, as well as integration of, the CE territory.

[290] Central Europe Managing Authority, 2017.
[291] SOGES spa – ERAC bv, 2012.
[292] ERICarts, 2014.
[293] Grennovate! Europe, 2014.
[294] Inova, 2013.
[295] Komobile, 2013.
[296] PAU, 2014.
[297] REC, 2014.

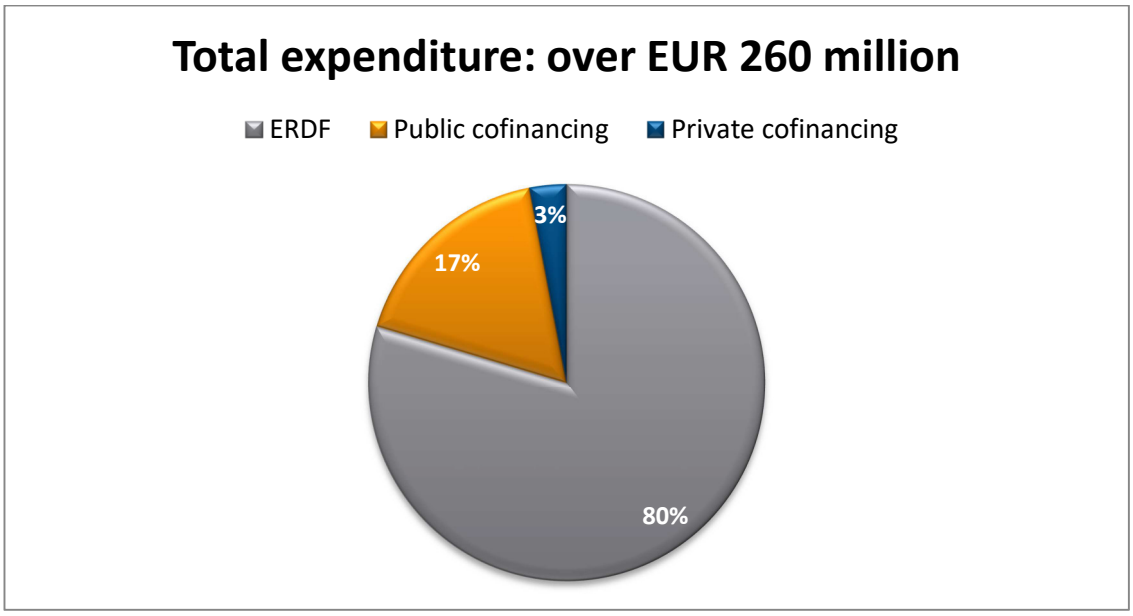
- Step 3 – Analysis of the programme's outreach: This step explores the extent to which the programme was able to communicate its results and outputs to its stakeholders in the public and private sphere.

3.1.1. Inputs

In the period 2007-2013, the CE Programme spent a total of over **EUR 260 million**[298] on financing **124 projects** in the four priority areas: a) innovation, b) accessibility, c) environment and d) competitiveness. Some 80% of the expenditure was financed via the European Regional Development Fund (over EUR 231 million), 17% via public co-financing (over EUR 42 million) and 3% via private co-financing (almost EUR 8 million) (see Figure 3.1).[299]

Against the planned expenditure of around EUR 279 million in the CE Operational Programme,[300] (excluding the budget for Technical Assistance) the actual expenditure corresponds to a 94% absorption rate, i.e. the ratio of the funds actually used to the funds allocated/planned. As the socio-economic environment deteriorated, many projects were challenged by reductions, delays or complete reconsideration, which created serious implementation bottlenecks. These, however, were solved through adjustments made in a revision to the original Operational Programme and the solutions proposed by the MA,[301] thus ensuring that almost all the allocated funds could in the end be used to finance the 124 projects.

Figure 3.1 / Total eligible expenditure 2007-2013 CE Programme, in EUR million

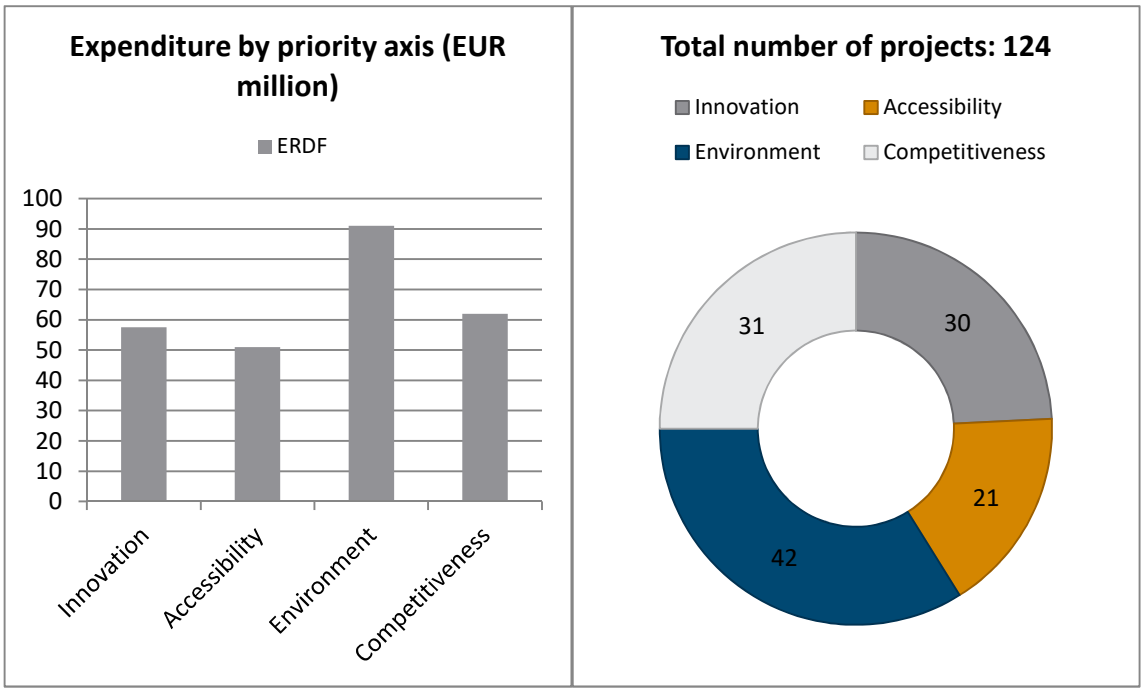


Source: JTS/MA CE Programme.

[298] This number refers to eligible expenditure and does not contain additional financing for Ukraine participation from the European Neighbourhood and Partnership Instrument.
[299] Central Europe Managing Authority, 2017.
[300] Central Europe Managing Authority, 2012.
[301] SOGES spa – ERAC bv, 2012.

Broken down by priority axes, the highest share of support went to the environment axis, which had both the largest number of projects (42) and the largest volume of funding (ca. EUR 91 million) compared to the other priority axes (see Figure 3.2). The other three axes got each around EUR 50 million of funding – specifically, projects on the innovation axis were supported with EUR 67.5 million; on the accessibility axis – EUR 51 million; and on the competitiveness axis – EUR 62 million. The difference in funding was also reflected in the actual number of projects supported on each axis, i.e. 31 competitiveness, 30 innovation and 21 accessibility projects.

Figure 3.2 / Expenditure (in EUR million) and number of projects, by priority, 2007-2013 CE Programme



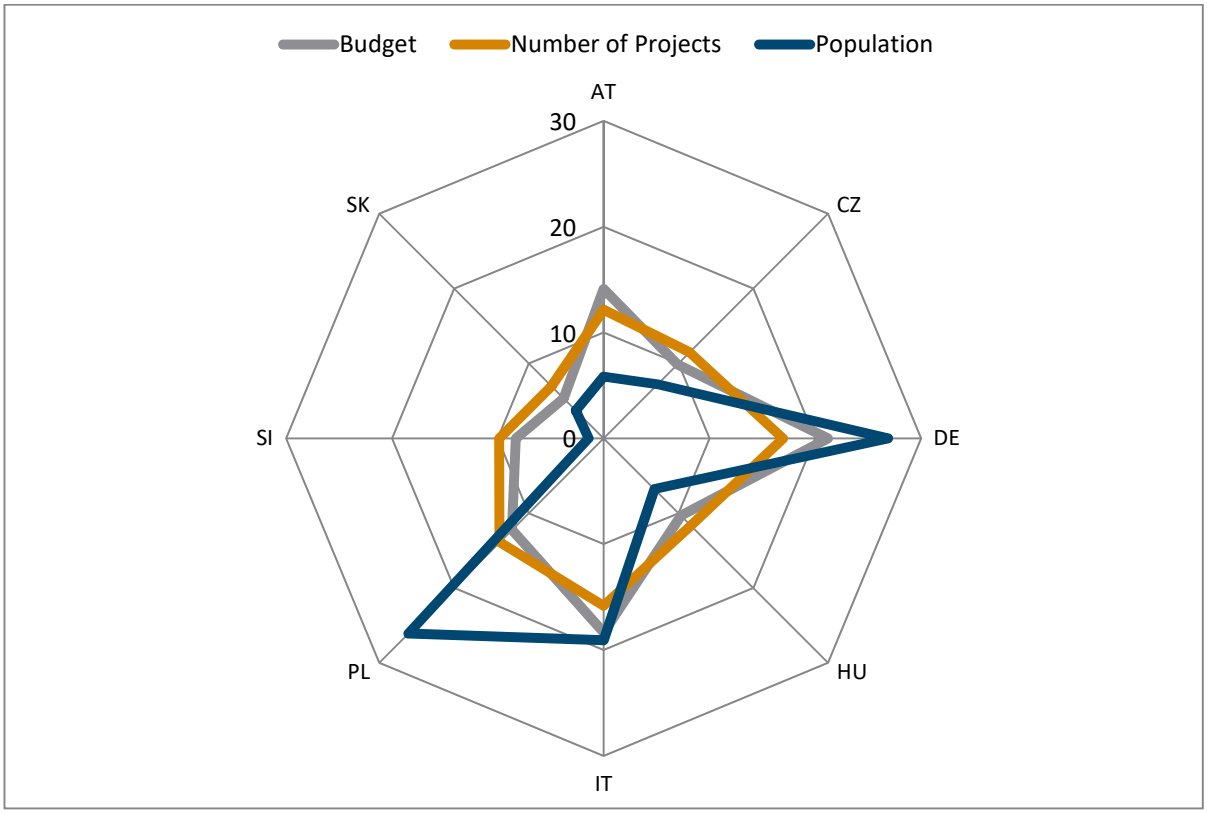
Source: MA/JS Interreg CE Programme.

Breaking down the total eligible budget and the number of project partners by CE core country[302] shows that the highest number of project partners is recorded in Germany (236), Italy (220) and Poland (193). At first sight, this distribution corresponds to the distribution of population across countries. However, a closer look reveals that less-populous CE countries tend to be proportionately over-represented in terms of CE projects, as well as in terms of their share of the total budget (see Figure 3.3).

The best example to illustrate this is Slovenia, whose share of the CE population is around 1.4% (using 2014 population data), while its share in the total number of CE project partners is 10% and its budget share reaches 8% of total budget. Similar patterns are seen for the Czech Republic, Hungary and Slovakia. Meanwhile the bigger countries of Germany, Italy and Poland tend to have relatively low shares of the budget and the projects, compared to their share of total CE population.

[302] That is without countries that participated in some of the CE projects, like Belgium, Romania or Ukraine.

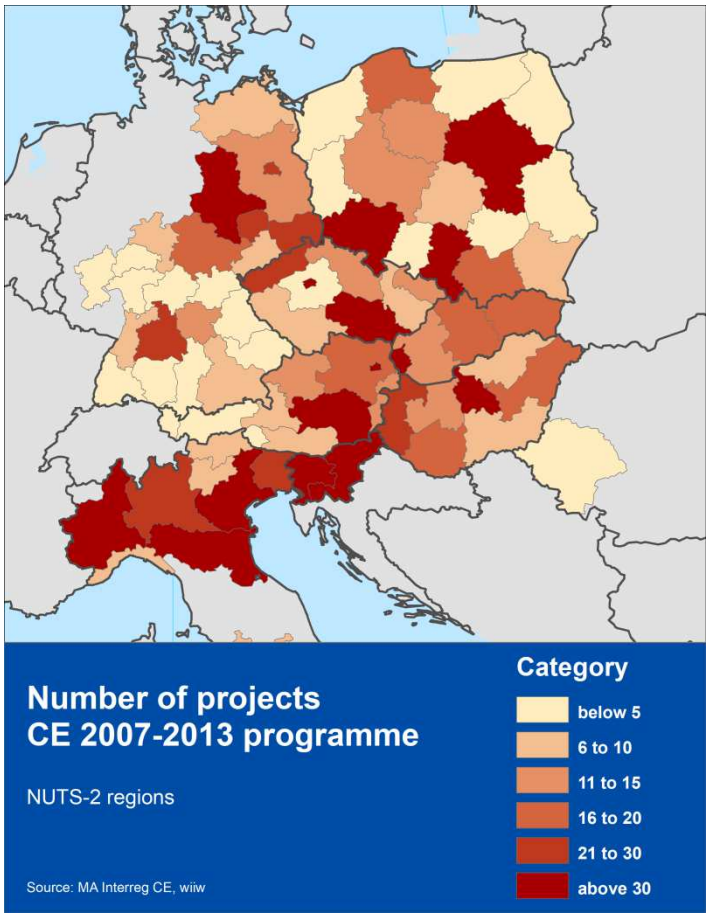
Figure 3.3 / Budget, number of projects and population by country*, 2007-2013 CE Programme – as % of total budget and number of projects



*Note: Belgium, Romania and Ukraine also participated in some CE projects. Their numbers are not reported. For Germany and Italy only the population in the CE territory has been considered.
Source: MA/JS Interreg CE Programme.

The distribution of project partners by CE NUTS-2 regions is illustrated in Figure 3.4. It shows some concentration of CE projects in the big cities. This is to some extent understandable, as they are the main locations for government and non-government agencies and research institutions. Thus, projects are developed in those places that have the highest human and physical capacities. On the other hand, such a concentration raises the question of whether such a centralised project structure has trickle-down effects to other, less urbanised regions.

Figure 3.4 / Number of CE projects, by NUTS-2 region



Source: MA/JS Interreg CE Programme.

3.1.2. Outputs and results

The **analysis of outputs** and **results** focuses first on the interpretation of the output and thematic results indicators collected by each of the 124 CE 2007-2013 projects. These indicators are analysed in a quantitative manner at the aggregate level, as well as in a bit more detail at the priority axis and country level. This is complemented by a qualitative analysis summarising the main outputs and results, based on the findings of the CE 2007-13 Programme's final implementation and evaluation report and the six thematic studies listed above.

In the CE 2007-2013 Programme, there are five main types of output, related to: a) joint strategy + action plan development, b) transnational tool development, c) joint management establishment, d) investment preparation and e) pilot actions. They are defined as follows:[303]

[303] See: CENTRAL EUROPE Programme – Application Manual – Annex III: Typology of outputs and indicators

- **Joint strategy + action plan development:** A 'strategy/policy document implemented/adopted' has to be endorsed by a competent decision-making body. It is a plan to solve certain problems relevant to the CE regions. For this it provides a common vision and sets objectives and priorities in a mid- to long-term perspective. An action plan breaks down the strategy goals and objective into specific tasks, including a sequence of steps to be taken, or activities that must be performed, for a strategy to succeed. They can relate either to the development of new strategies/actions plans or to the improvement of existing ones, as well as their subsequent implementation.
- **Transnational tool development:** A tool is a means for accomplishing a specific task or purpose; they can be physical or technical objects, but also methods, concepts or services. Examples are analytical tools, management tools, technical tools, software tools, monitoring tools, decision-support tools.
- **Joint management establishment:** 'Permanent cooperation' focuses on durable links between entities established in a formalised way and documented by e.g. expressions of interest, memorandums of understanding, etc.; 'permanent management structures' involve the establishment of governance and management systems between entities, e.g. cluster management, associations, etc.
- **Investment preparation:** This is linked to the preparation of a specific physical investment (e.g. feasibility study, technical specification, etc.) with a clear and short-term perspective on its implementation.
- **Pilot actions:** A pilot action focuses on the practical testing of a transnationally developed service, tool or methodology. A pilot action is a practical implementation of novel schemes. It is of an experimental nature and aims at testing, evaluating and/or demonstrating the feasibility and effectiveness of a scheme.

In addition, the CE 2007-2013 Programme also used a number of thematic result indicators. These indicators are assumed to show, at least partly, the effects of the outputs. The results indicators are:[304]

- **Amount of funds leveraged based on project achievements:** They contain all (additional) funds leveraged because of direct project effects (within a time horizon of five years after the project ends). Importantly for the analysis, a distinction can be drawn between the generation of follow-up projects funded at the local/regional/national/EU level or as the preparation of investment with a mid-term perspective (up to five years for its realisation); the latter includes inter alia the up-scaling of pilot actions and demonstration activities.
- **Number of jobs created:** These are new and durable jobs created during or after the end of a project (up to five years) as a direct effect of the project's achievements.
- **Number of trained persons:** This is the number of people who participated and completed the training, as defined in the output category.

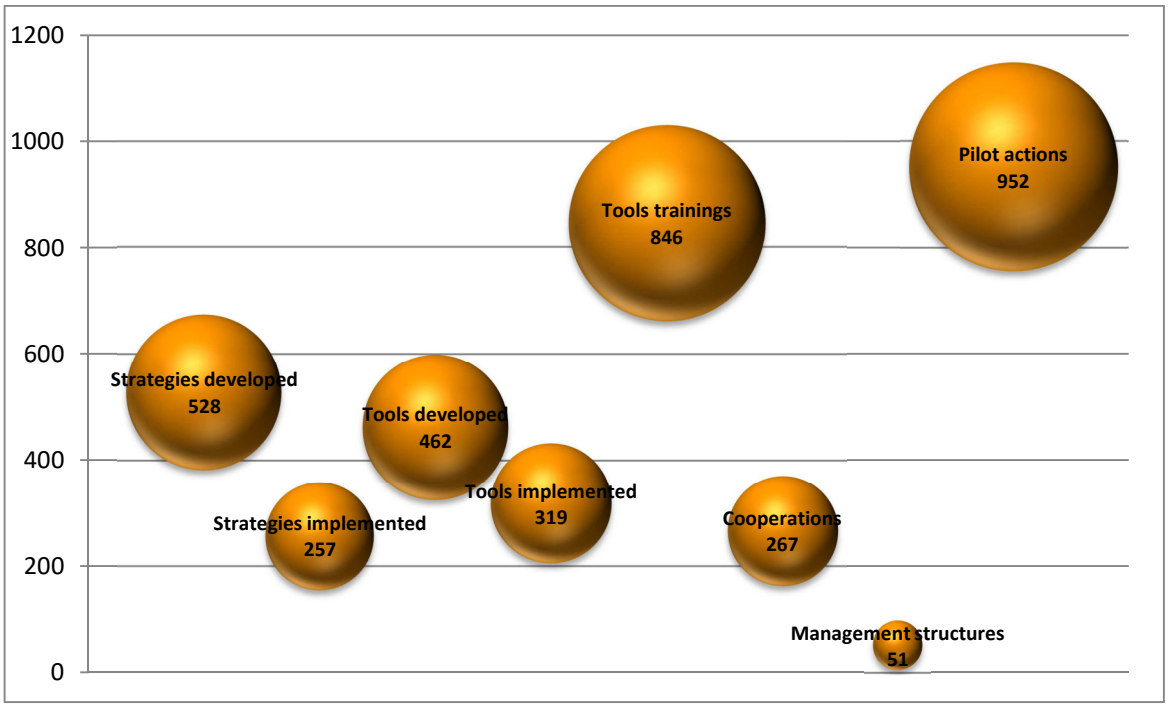
3.1.2.1. CE 2007-2013 Programme's outputs

Starting with the CE 2007-2013 Programme's outputs, the analysis focuses first on the pure numbers reported by the 124 projects. In total, the CE 2007-2013 Programme produced 3,682 outputs, i.e. around 30 'outputs' per project. The most frequent output type was pilot actions – 952 pilot actions were

[304] Only those indicators are defined that have been provided by the JTS/MA and thus are used in the analysis.

implemented in the CE 2007-13 Programme; this was followed by training courses (846), strategies developed (528) and tools developed (462); the complete distribution of outputs by type is shown in Figure 3.5.

Figure 3.5 / Number and type of outputs, CE 2007-2013 Programme

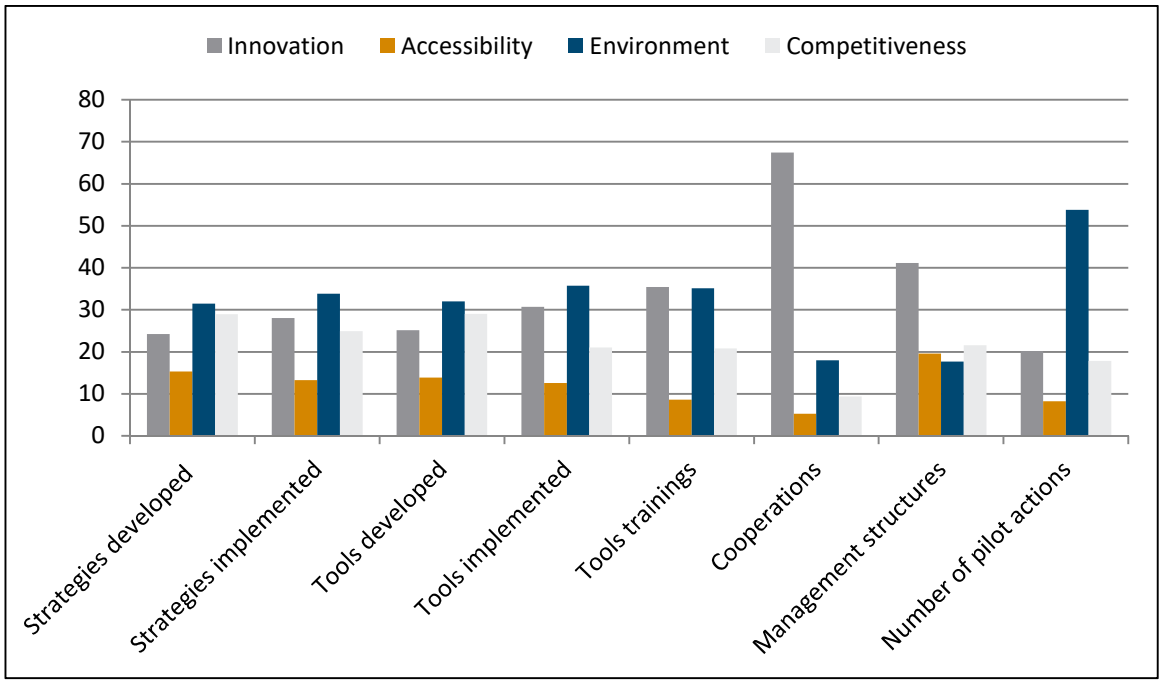


Source: MA/JS Interreg CE Programme.

The distribution of outputs across the priority axes (see Figure 3.6) corresponds largely to the distribution of projects across priority axes. Thus, the higher number of outputs produced under the environmental axis (compared, say, to the accessibility axis) is mainly due to the higher number of projects. Hence, for most output types (e.g. strategies developed or implemented) the average number of outputs was approximately the same for the priority axis; in other words, the four priority axes were equally productive in generating outputs.

Exceptions to this are instances of cooperation and management structures established by the projects. Here, more than two thirds of all CE programme co-operations were set up in the innovation axis alone; likewise, the same axis created more than 40% of all management structures. Compared to its share of 24% of projects and its 22% share in total CE Programme expenditure, the innovation axis's contribution to these two output types was over-proportionate. Similar can be said about the environment axis and pilot actions. Its share in total project was 34%, while its share in total pilot actions implemented by CE projects was 54%. More than for other priorities, pilot actions, through their partly experimental design, are highly useful to showcase innovative solutions to environmental and energy related challenges (see the case studies on the CE 2007-2013 projects: CEC5, COBRA MAN, LABEL, MANERGY, RENEWTOWN, REURIS and SECOND CHANCE).

Figure 3.6 / Outputs by priority axes (as % of respective outputs)



Source: MA/JS Interreg CE Programme.

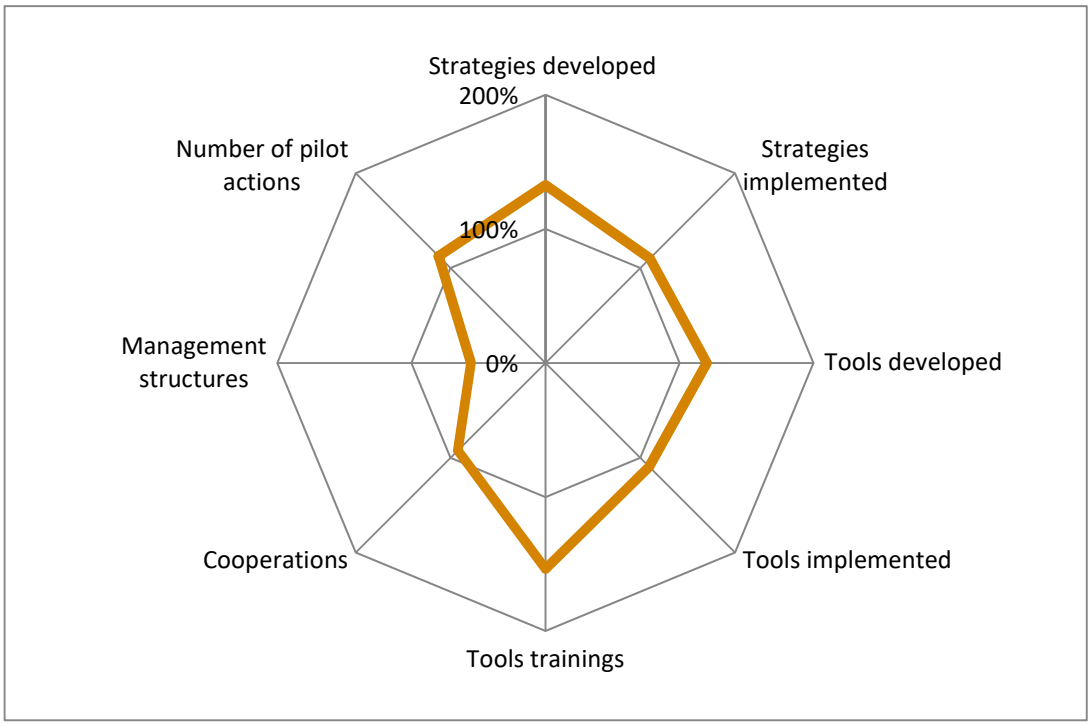
With their high number of outputs, the CE 2007-2013 Programme and its projects not only met, but generally exceeded initial expectations. The ratio of actual to planned outputs gives a 'success rate': Figure 3.7 shows the 'success rate' by type of output and for the CE Programme overall. The success rates by output and priority axis are generally very similar to the aggregate rates. The figure shows that for most outputs the CE Programme exceeded its set targets by between 10% (tools implemented) and 50% (training courses). Only the number of cooperation ventures and management structures created remained below expectations. Programme authorities clarified that this lower achievement was mainly due to a misunderstanding by the beneficiaries regarding the indicator definition for target setting in the project application forms.[305]

Despite the impressive output numbers, they cannot adequately reflect the more profound impacts of the CE projects. Rather, these impacts are captured by the six in-depth thematic studies which were conducted by the programme[306]. Regarding the general impact of the programme, they find that the projects' outputs created significant value added through the generation of experience and knowledge,[307] the provision of training opportunities and alternative solutions for management and implementation problems, the building of trust, the discovery of future markets, etc.[308] Furthermore, TNC was essential for the building of institutions (e.g. in transport) that allow cooperation with regard to

[305] Central Europe Managing Authority, 2017, p. 29.
[306] http://www.central2013.eu/documents-2007-2013/programme-publications/thematic-studies/?L=se%251%20or%201%253
[307] EriCarts, 2014, also PAU, 2014.
[308] EriCarts, 2014.

planning and solving joint problems, beyond the duration of the individual projects and the CE Programme in general.[309]

Figure 3.7 / Project outputs – success rate (realised/planned outputs)



Source: MA/JS Interreg CE Programme.

3.1.2.2. CE 2007-2013 Programme's results

This section briefly analyses the CE 2007-2013 Programme's results, as measured by the specific indicators illustrated above. To start with, the CE Programme was highly successful in preparing further investment and leveraging funds. In figures, the CE projects prepared investment worth EUR 791 million and leveraged funds worth over EUR 3.5 billion. The high amount of leveraged funds in particular greatly exceeded expectations – i.e. actual funds were more than 9.5 times higher than those initially planned – while investment preparation stayed below expectation (only around 53% of targeted investments could be prepared). The seemingly weaker performance in investment preparation is, however, explained by the fact that amounts were partly reported under the indicator 'funds leveraged', which led to the latter being overestimated. To put this in perspective, the total sum of prepared investments and leveraged funds generated by the CE 2007-2013 Programme amounted to EUR 4.3 billion, as against the sum of investments and leveraged funds initially planned – EUR 1.86 billion. Thus overall the CE 2007-13 Programme actually raised 2.3 times more funds than was initially expected.

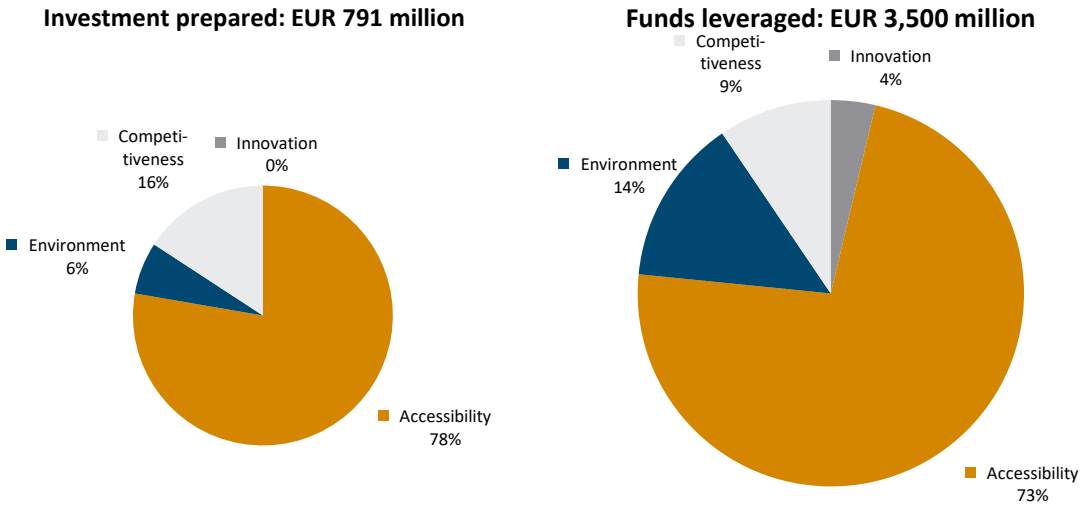
Although all priority axes contributed strongly to the CE 2007-2013 Programme's successful investment preparation and funds leveraging, the accessibility priority axis (Priority 2) clearly stands out (see Figure 3.8), partly on account of the cost-intensive nature of transport infrastructure. This axis alone prepared

[309] Komobile, 2013.

investments of over EUR 615 million and leveraged funds worth EUR 2.6 billion (exceeding the target set more than 13 times). Four projects (out of the total of 21 accessibility projects) were mainly responsible for this. The ChemLog, SoNoRa and FLAVIA projects all prepared feasibility studies to facilitate the implementation of a large-scale intermodal transport infrastructure, while the TROLLEY project prepared investments in new trolleybuses and related infrastructure.[310]

Although the three other priority axes combined generated less additional investment and funds than the accessibility axis, their performance was still impressive, especially regarding the rates at which targets were overfulfilled. To illustrate this, the innovation axis leveraged funds worth EUR 130 million, thus exceeding the target set by over 300%. A major contribution came from the I3SME project, which aimed at improving the R&D and innovation performance of micro-enterprises and SMEs. Important contributions also came from the PROINCOR project, which focused on the innovation performance of SMEs in main manufacturing and industrial service sectors, and the SMART FRAME project, which generated transnational R&D projects with a volume of more than EUR 18 million and brought 108 jobs due to the creation of start-ups.

Figure 3.8 / Investment prepared and leveraged funds, CE 2007-2013 Programme



Source: MA/JS Interreg CE Programme.

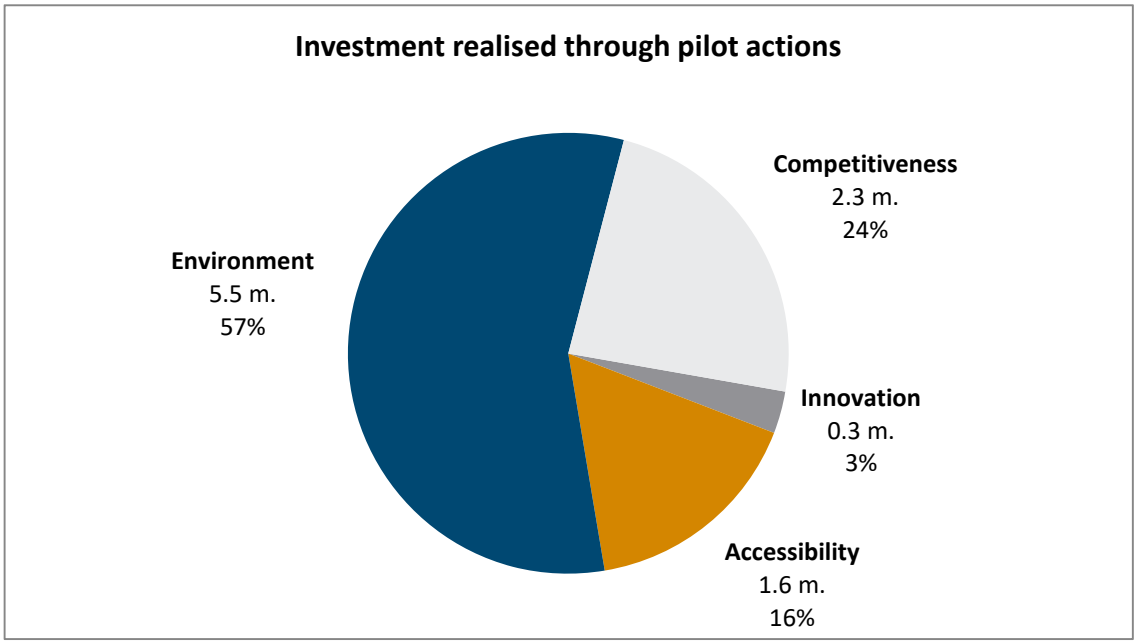
The environment priority axis prepared investments worth 51 million Euro and leveraged funds of more than 488 million Euro (i.e. 400% of the initial target values). The 4BIOMASS, FOKS and REURIS projects were the main contributors, unlocking investment projects for biomass plants, groundwater remediation plans as well as rehabilitation of urban river spaces. The CoP, MANERGY and CEC5 project were additional main contributors and leveraged funds for the energy efficient refurbishment of buildings, the use of renewable energy sources and increasing energy efficiency within municipalities[311].

[310] Central Europe Managing Authority, 2017, p. 36.
[311] Central Europe Managing Authority, 2017, p. 44.

Finally, the competitiveness priority axis prepared investment worth EUR 125 million and leveraged funds of EUR 334 million, the latter surpassing its initial target value by more than 30 times. The main projects responsible for this were the CircUse project (inducing investments for the rehabilitation of urban and peri-urban functional sites), the SECOND CHANCE project (which aimed at the regeneration of five brownfield sites), ACT4PPP (which focused on the reconstruction of infrastructure and buildings through public–private partnership models) and the COBRA MAN project (brownfield rehabilitation).

In addition to these, pilot actions also realised investments. However, those are not comparable to the investments prepared above, either in their purpose or in their amount. Whereas in the above case investments were follow-up investments in the wake of the CE projects' results, pilot investments are an integral part of the action, e.g. to showcase and test the benefits of energy-efficiency measures, etc. Usually, these are small-scale investments with a strong bias toward demonstration. As such investments depend on CE funding, they are by nature also much smaller than the investments mentioned before (see Figure 3.9).

Figure 3.9 / Investment realised by pilot actions (in million Euro and % of total)



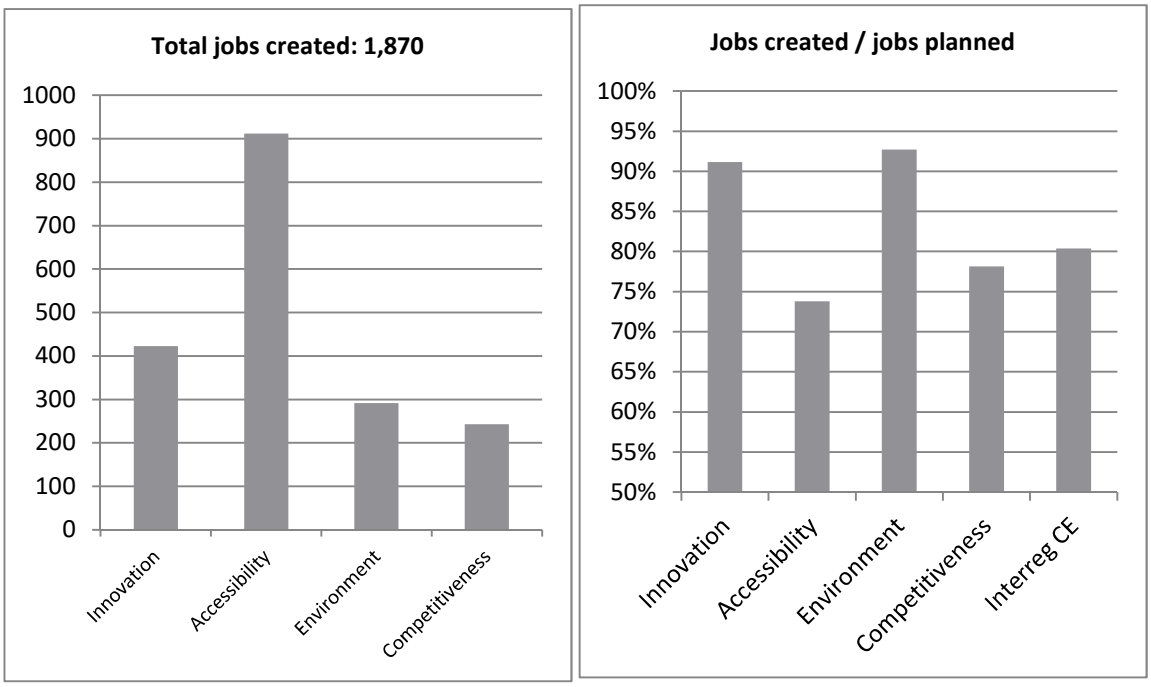
Source: MA/JS Interreg CE Programme.

In total, the CE pilot actions realised investments worth around EUR 10 million, with more than 50% coming from the environment priority axis. Despite this relatively low figure, it is noteworthy that the value added of these investments lay not in their size, but in their purpose – to provide opportunities for the application of innovative solutions or for testing new tools and technologies.

Turning finally to the number of jobs created by the CE 2007-2013 Programme, the results are mixed. In total, the CE Programme generated 1,870 new jobs, of which around 50% came from the accessibility priority axis (with its high level of investments prepared) (see Figure 3.10). With this number of created jobs, the CE Programme reached only 80% of the targets initially planned. To interpret this, it is

noteworthy that a) the CE 2007-2013 Programme operated in an economic environment marked by the negative effects of the economic and financial crisis and b) the recording of jobs created ceased with the end of the project, thus potentially neglecting jobs created afterwards. Therefore, in addition to the CE 2007-2013 final evaluation report, it would not only be 'interesting to follow up the project development to check whether the jobs created will be permanent and sustainable once the activities are not anymore subsidised',[312] but also to follow the projects' positive effects, in terms of creating jobs, investments, policies, etc., once they have ended.

Figure 3.10 / Total jobs created (left graph) and job-creation success rate (right graph), by priority axis, CE 2007-2013 Programme



Source: MA/JS Interreg CE Programme.

[312] SOGES spa – ERAC bv, 2012.

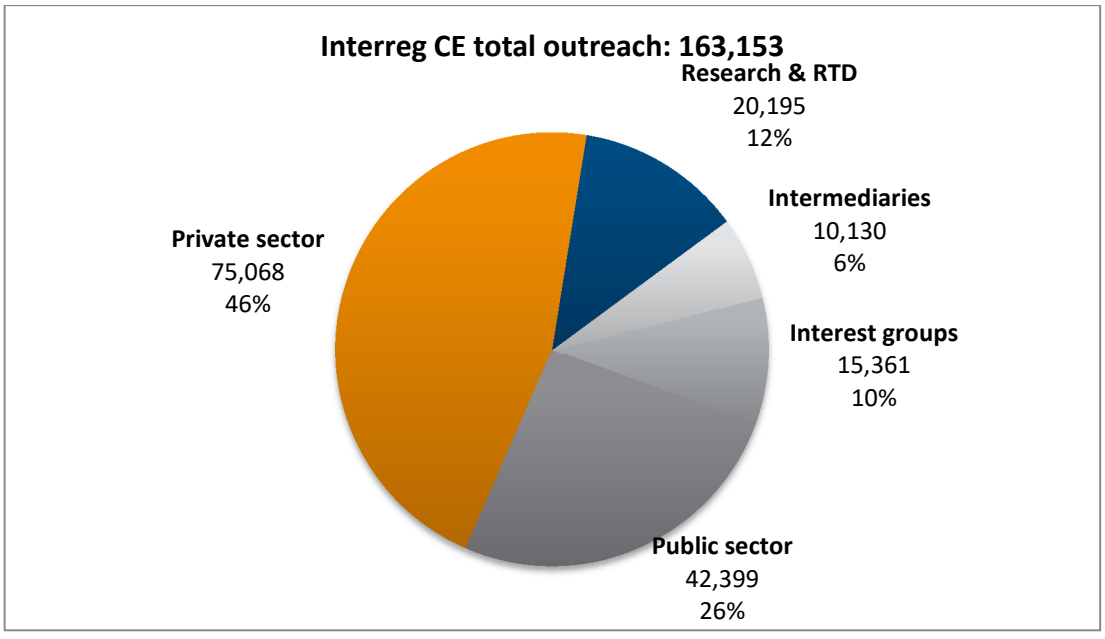
3.1.3. Outreach

The analysis of the CE 2007-2013 Programme's outreach is indicative of the projects' success in communicating their activities, outputs and results to their stakeholders and the wider public. The programme's outreach consists of two components: a) digital reach, measured by the number of unique visits to the projects' websites and b) physical reach, measured by the number of participants at project events.[313]

Furthermore, outreach is divided by stakeholder groups into a) public sector (national, regional and local authorities, b) private sector (businesses), c) research & research and technological development (RTD) (university faculty, college, research institution, RTD facility, research cluster), d) intermediaries (e.g. business support organisations, like chamber of commerce, chamber of trade and crafts, business incubator or innovation centre, business clusters) and e) interest groups (trade union, foundation, charity, voluntary association).[314]

Given this, the CE 2007-2013 Programme addressed in total more than 163,000 entities (see Figure 3.11) , i.e. 1.3 times more than initially targeted. Thus the programme reached more than 75,000 entities from the private sector, 42,000 from the public sector, more than 20,000 in R&D, as well as 15,000 interest group entities and 10,000 intermediaries.

Figure 3.11 / Outreach CE 2007-2013 Programme, by stakeholder group (absolute numbers and % of total)



Source: MA/JS Interreg CE Programme.

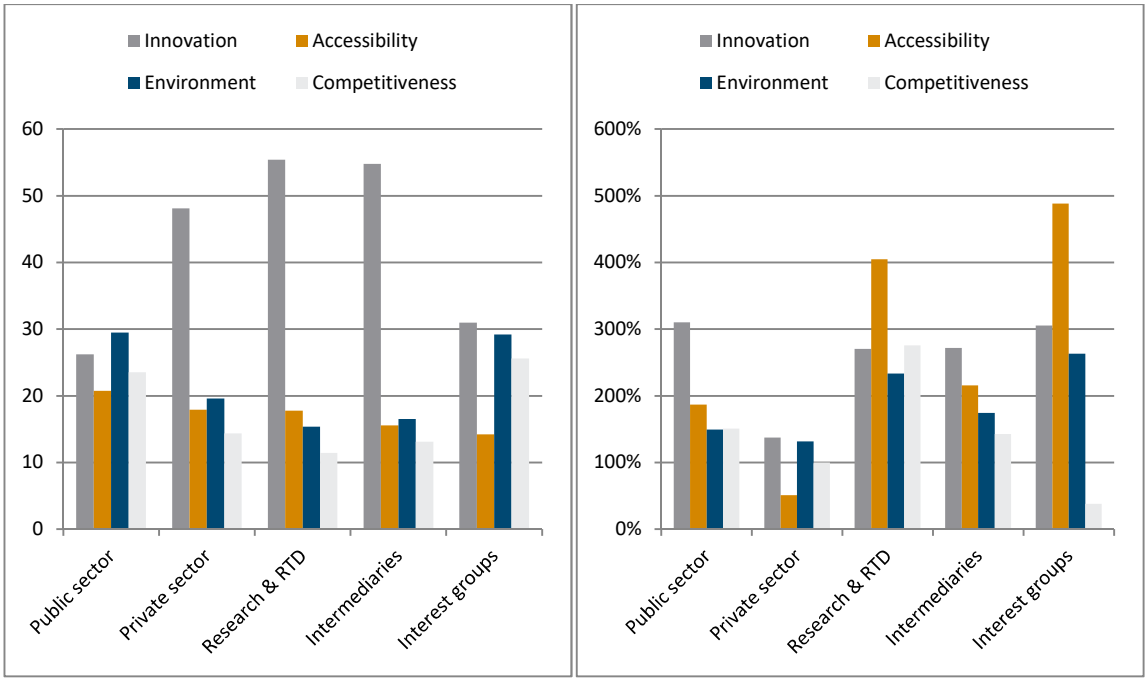
[313] See: CENTRAL EUROPE Programme - Application Manual – Annex III: Typology of outputs and indicators. http://coopterritoriale.regione.veneto.it/Central-Europe/wp-content/uploads/2015/07/CE_-_Appl_manual_with_annexes_single_file.pdf
[314] See: CENTRAL EUROPE Programme - Application Manual – Annex IV: Types of partners and target groups. http://coopterritoriale.regione.veneto.it/Central-Europe/wp-content/uploads/2015/07/CE_-_Appl_manual_with_annexes_single_file.pdf

All four priority axes showed a high capacity to address their relevant target groups. Thus, if we take the innovation priority axis's focus on building networks between business, research and the public administration sector, it was highly successful at communicating with the enterprise/business sector (more than 36,000 entities), with the research/technology development community and with the public sector (more than 11,000 entities each) – going well beyond the initial targets.[315]

Likewise, the accessibility priority axis managed to address all the relevant stakeholders in its field, showing a good multi-level involvement of public and private sectors, service providers and research institutions. The projects on this axis reached 13,400 entities in the enterprise/business sector, 8,800 public-sector bodies (187% of the target value) and more than 3,600 R&D entities (405% of the target value).

The environment priority axis concentrated on the private (14,700 entities) and public (12,500) sectors, and only to a lesser degree on the research community, intermediaries or other interest groups. Similarly, the competitiveness priority axis's projects also tended to focus on public and private entities (around 10,000), while communication with other types of stakeholders was comparatively low.

Figure 3.12 / Outreach (left graph) and outreach success rate (right graph) CE 2007-2013 Programme, by priority axis and stakeholder group (as %)



Source: MA/JS Interreg CE Programme.

Overall the success rates show that, with minor exceptions, external communication by the CE projects was much more intensive than initially planned. This indicates that many of these projects were addressing issues of high relevance to all types of stakeholders, thus raising their interest and promoting the CE Programme throughout the CE territory.

[315] Central Europe Managing Authority, 2017, p. 29.

3.2. QUALITATIVE ASSESSMENT OF RESULTS

3.2.1. Priority 1 – Facilitating innovation across Central Europe

Priority 1 of the CE 2007-2013 Programme contributed significantly to **improving** the **framework conditions** for innovation in the CE countries and regions. Relevant results in this respect were achieved through a variety of project **activities** and outputs aiming at developing **structures and tools** for, inter alia, **business support** and **technology transfer**.

Such tools included, for instance, the creation of databases (as in the ACT CLEAN project, which built a database of good practices on clean production technologies for the use of SMEs in the CE territory) or as in the Centrope_tt project (which set up a database of more than 1,500 R&D providers in the Centrope region – including border regions in Austria, the Czech Republic, Slovakia and Hungary). Apart from that, the Centrope_tt project also included the Centrope_tt Academy, which offered to participants an ECQA (European Certification and Qualification Association) certification for transnational research, technology and innovation (RTI) manager.

Furthermore, Centrope_tt assisted 34 SMEs via the Centrope_tt voucher scheme to enter into cooperation with service provider organisations from another country for a service contract of up to EUR 5,000. As an example, the Czech SME Sobriety s.r.o. entered into cooperation with the Faculty of Physics of the University of Vienna in a small-scale research project on a new measurement methodology for micro- and nanostructured materials. Voucher schemes can contribute significantly to promoting the internationalisation of SMEs, facilitating the establishment of links abroad and opening the way to external markets.[316]

A showcase for the diversity of structures and tools developed in the CE projects is provided by the AutoNet project (Transnational Network of Leading Automotive Regions in CE). Among other activities, the project developed a ‘matchmaking’ database and organised ‘matchmaking’ events for firms to promote the internationalisation of automotive sector companies.

Other projects have tackled the topic of knowledge development by supporting **human capital development** in the education and research system, as well as by addressing the **brain drain** and **return migration**.

In part, this was done by developing transnational strategies and joint action plans, as in the WOMEN project, which focused on the brain drain of well-educated young women. Also, the YURA project developed transnational youth strategies for regions with migration; it included a wide range of stakeholders, including 52 regional companies, 103 schools, 3,560 pupils and 129 regional political stakeholders. The project resulted in 39 new collaborations, with 60 follow-up projects and activities planned.

Likewise, the IDEA project developed a strategy to enhance the potential of CE SMEs to face the increasing demand for innovative and highly qualified workers. This strategy was supported by a number

[316] Inova, 2013.

of pilot actions to test the matching of supply and demand of high skills between the education sector and SMEs.

Other more innovative tools to reduce the brain drain and/or improve human capital included the introduction of the Women Are Future award for female entrepreneurs, female-friendly companies and female start-ups and the organisation of training for demography managers in the CE territory (in the in the WOMEN project). These courses are intended to raise the capacity to manage the female brain drain, and were supported by the coaching of companies to create career opportunities for young women.

Finally, the Re-Turn project, which seeks to enhance the human capital and the entrepreneurial abilities of returning migrants in CE regions, developed a handbook that provides a comprehensive guide on setting up pilot projects as a response to the specific brain-drain situation in CE. It deals with a) tools to attract returning migrants, b) one-stop-shop settings to reintegrate migrants easily and c) support for the entrepreneurial capacities of return migrants.

Thus, many CE projects have created a framework for a fruitful **policy learning process** in the innovation field, at the same time addressing the barriers to innovation faced by regional businesses. While some projects implicitly included policy learning, others had an explicit focus on it – e.g. the IDEA project supported the innovative development of CE regions by fostering transnational knowledge development. It aimed at identifying, sharing and implementing good practices, resulting in a strategy to secure human capital in CE regions for the innovation process. Likewise, the CluStrat and the ClusterCOOP project developed and tested new policy approaches to upgrading the innovation and funding capacity of clusters.

Other policy learning activities included the creation of networks, such as in the PLASTiCE project, which connected the national contact points of CE countries to promote the industrial use by SMEs of biodegradable polymers. An important result of this project was the establishment of the first certification system in bioplastics in Slovakia and Slovenia, both of which did not have such systems before.

Other projects that had an explicit policy learning focus were the NANOFORCE project, linking scientific knowledge in nanotechnology to business, CentraLab and the InoPlaCe project.

A major aspect of the CE projects' success in promoting innovation was the focus on **capacity building** (including policy learning and the sharing of existing tools, practices and mechanisms) and on the implementation of **pilot actions**, which allowed experiments with new support measures and mechanisms. Thus, many of the projects collected or developed a set of **good practices**, which offers a repository of pre-validated solutions, targeting existing and potential barriers to innovation at the level of regional and local policies.

An example of this is SMART FRAME, which created a network of local industry support services in order to enhance their capacity by sharing knowledge and transferring good practice, as well as by jointly developing tools and mechanisms to facilitate technology transfer and cooperative R&D processes.

A good example of a project combining both capacity building and pilot actions in support of innovation is the CEBBIS (Central Europe Branch Based Innovation Support) project. Its capacity-building elements included the benchmarking and identification of regional best practices in technology transfer, as well as the establishment of an ICT-based network of innovation intermediaries. Through its pilot actions, the project developed direct services to SMEs by testing services like rapid prototyping, lean manufacturing or product design. As a result, CEBBIS improved the business support practices of its 11 partners, thereby benefiting over a hundred assisted companies in the respective regions; in addition, CEBBIS directly assisted about 80 SMEs in developing partnerships for research and innovation projects or in addressing technological issues.

Other notable project examples in this area are IntraMED-C2C (which focuses on capacity building in the field of innovation transfer in the medical sector) and I3SME, which established a network of facilitators to address SMEs (through visits and training sessions) and identify good practices in innovation that could be shared with other regions.

A major element in capacity building was the organisation of **training sessions and workshops** by the CE projects, e.g. to reduce the shortage of innovation management skills or to support more complex and tailored activities, such as funding schemes, mechanisms to foster cooperation between innovation actors, internationalisation of innovation or countering the general lack of research capabilities.

These CE project training efforts are illustrated by the INNOTRAIN IT project. It provided training to over 1,000 transnational SMEs on IT service management to improve innovation management skills and the complementary skill of using social media tools to promote business activities. The CNCB project provided cluster manager training, while the FLAME project trained facilitators to foster concrete collaboration between business and science.

3.2.2. Priority 2 – Improving accessibility of and within Central Europe

Priority 2 of the CE 2007-2013 Programme contributed in many ways to an improvement in the transport situation within the CE territory. Thus the 30 transport-related projects focused on four major issues: a) greenhouse gas emissions and energy-efficient transport, b) intelligent transport systems (ITS), c) Trans-European Transport Networks (TEN-T) and d) environmental qualities and transport emissions.

The projects supported the use of **ICT** and access to ICT services in transport; promoted **modal shifts** in passenger and freight transport to energy-efficient transport modes; implemented pilot actions to apply **new technologies** or new planning approaches; established CE cooperation structures for better **access** to European sea ports and established strategic cooperation between and within trans-European transport corridors; and participated in the development of the **TEN-T** Core Network, thus also preparing future large-scale infrastructure investments in the CE territory. These results are described in more detail below.

Two projects (CHAMPIONS and EDITS) promoted the use of ICT and intelligent transport systems (ITS) in passenger transport. In pilot actions, EDITS installed cross-border multimodal real-time traffic and travel information systems, thus improving the mobility of people and accessibility in the CE regions. Considering accessibility in a wider sense, it is noteworthy that the SPES project (which focuses on

telemedicine) developed – in collaboration between software developers and users – time- and cost-saving solutions for patients in various CE regions.

In the area of freight transport, four projects (KASSETTS, LOGICAL, ChemLog T+T, ESSENCE) developed ICT/ITS applications. ChemLog T+T developed a system to efficiently use multimodal transport means, while other projects focused on interoperability in logistics businesses or hubs (LOGICAL, ESSENCE). Another aspect was to improve the accessibility of SMEs to support more efficient freight transport solutions, improving the load factor (i.e. the ratio of the average load to a vehicle's freight capacity), in order to reduce 'empty kilometres' and improve fuel consumption.

Projects in the area of TEN-T focused on (intermodal) freight and passenger transport in the TEN-T, on the development of a specific TEN-T axis (e.g. BATCo on the Baltic–Adriatic TEN-T corridor, SoNorA on the South–North axis, and Via Regia plus on an East-West Axis, thereby preparing future large-scale investments that cannot be tackled in a European Territorial Cooperation programme, but rather draw on the funds available to finance TEN-T core infrastructure.

Projects' activities included cooperation and institution building, like CENTROPE CAPACITY. Its main objective was comprehensive institution building and the creation of a strategy for the promotion of a transregional integration process. Although financed under Priority 4 (competitiveness) it had a strong transport infrastructure related focus. Thus, it included a number of pilot actions, e.g. an infrastructure needs assessment, a proposal for a transnational multimodal traffic information system, a development plan for a transnational (public) transport association and the development of a coordinated transport strategy. As a result, the Centrope region possesses a sound transnational decision-making process for transport issues concerning border regions in Austria, the Czech Republic, Hungary and Slovakia.

To improve passenger transport, the Via Regia plus project enhanced the accessibility of cities along the East–West Corridor Erfurt/Berlin–Lviv/Košice with a number of pilot actions. These included a) the development of cross-border/transnational rail links, b) coordinated investments in road schemes, and c) the development of integrated cross-border/transnational rail connections, including a cross-border tariff scheme.

Multimodal transport within TEN-T was addressed by a number of projects (ChemLog, SoNorA, BATCo, FLAVIA, EMPIRIC, INWAPO) that sought to enhance the services of combined transport, tackling questions of the requirements for certain commodities (e.g. dangerous goods for the chemical industry) and making some proposals for new infrastructures. Furthermore, through feasibility studies and other preparatory work, the projects helped to close infrastructure gaps, eliminate bottlenecks and improve the quality (e.g. electrification of railway lines) or capacity of the infrastructure (e.g. addressed in FLAVIA, SoNorA, INWAPO, ChemLog).

As far as greenhouse gas (GHG) emissions and energy efficient transport is concerned, around half of the projects under this topic focused on sustainable transport in urban areas. Some of the projects (BICY, Central MeetBike, TROLLEY, REZIPE, GUTS and INTER-Regio-Rail) promoted a modal switch of transport like for example to a) non-motorised transport means (such as cycling) and/or b) public transport . Also, some projects (BICY, GUTS, TROLLEY and Central MeetBike) supported the use of clean vehicles, e.g. electric buses (trolleybuses) in public transport and the operation of clean and zero-emission vehicles in public administrations. Some of the projects not only improved the energy balance

of transport in the CE regions, but also strengthened territorial cohesion through measures like the elaboration of a general strategy recommendation for national strategies promoting cycling (Central MeetBike). Likewise, some projects (TROLLEY) may create a critical mass of CE regions in a niche market like trolleybuses, which could have positive effects on the market power of the public transport companies in the cities involved.

Regarding freight transport, three projects explicitly focused on the improvement of multimodal transport chains (EMPIRIC, INWAPO, ChemLog T+T), with one of them (ChemLog T+T) showing that improving logistics in the chemical industry in CE could lead to a massive reduction in transport CO_2 emissions. Similarly KASSETTS, by developing and implementing ICT tools to help manufacturing SMEs optimise their transnational logistics, showed with pilot applications that smart logistic systems can reduce CO_2 output by 18%.[317] INWAPO used pilot actions – such as small-scale investments in the ports of Bratislava and Vienna – to promote the better utilisation of waterborne transport (inland waterways), which would have positive effects for all sorts of pollutants.

3.2.3. Priority 3 – Using our environment responsibly

CE projects in Priority 3 contributed to two main goals: a) **environmental protection**, sustainability, resource efficiency and eco-innovation, and b) **energy efficiency**. Thus, projects developed and adopted common strategies and action plans for environmental protection (focusing on biodiversity, water, soil and air) and the reduction of risks and the mitigation of impacts of **natural** and man-made **hazards**, including climate change. Also, projects focused on the implementation of pilot actions in the fields of waste management, resource efficiency, **eco-innovation** and **cleaner production**.

Projects related to **waste** addressed a) informal waste collection (TransWaste) through a transnational action plan and pilot actions (e.g. involving social enterprises in collecting, trading and repairing goods), b) the reuse of waste (CERREC) by establishing reuse centres in four CE regions, thereby creating green jobs for the long-term unemployed and providing affordable goods, c) awareness raising regarding wastepaper (EcoPaperLoop) and d) supporting eco-efficient production processes in SMEs by improving the take-up of best practice (ACT CLEAN). Of these, ACT CLEAN has developed permanent structures for supporting SMEs to develop cleaner production, connecting 200 institutions in this field. Common to all these projects is the strong focus on businesses and actors involved in waste management, including training, capacity building, the dissemination of knowledge, the setting-up of permanent structures and pilot actions.

Regarding **risk management** and **climate change** adaptation, a main project was INCA-CE, which established a state-of-the-art, high-resolution, real-time analysis and forecast system for atmospheric, hydrological and surface conditions. The meteorological forecasts from the system contributed significantly to the management of road safety, civil protection and hydrology in various CE regions. Another important project was UHI (Urban Heat Island). It developed policies and practical actions to reduce the impact of the UHI phenomenon. The regions involved in UHI included five capital cities in CE and several industrial centres – thus the most important regions in terms of economic and social development. Based on their experiences, UHI helped to develop new approaches to urban planning, which may be adopted by other regions and cities in the CE territory. Thus, UHI contributed to capacity

[317] Komobile, 2013.

building and knowledge exchange in participating cities, thereby increasing the capacity to adapt to climate change in CE.

A number of projects focused on **air pollution**. TAB addressed pollution from industry, transport and households by finding joint solutions with a wide group of stakeholders, including local government, industry, the health sector, public and other interest groups. It developed a set of integrated tools and actions, e.g. to collect and compare air-quality data in CE or develop plans for minimising the impact of air pollution. UFIREG focused on ultrafine particle pollution in five CE cities. By setting up a monitoring system and collecting relevant data, it filled an important gap in information. Moreover, by bringing together research institutes with public health and environment officials, it ensured that research results were followed up with policy responses. This was backed up by the development of a handbook, guidelines and strategies for public authorities.

As far as **soil protection** and **land use** is concerned, URBAN-SMS tackled the issue of soil sealing by providing urban planners with a methodology to assess the value of soil and its functions in urban planning processes. Additional outputs include a set of IT tools for assessing soil and processing spatial data, and a tool for integrating soil considerations into the strategic environmental assessment (SEA) and environmental impact assessment (EIA) processes. In this way, the project contributed significantly to improving the soil quality in major CE cities as well as to increasing the importance of soil protection in spatial planning. It thus also improved or safeguarded important soil functions and capabilities, such as water retention, providing a habitat for species, absorbing pollutants and microclimate regulation.

Other soil-related projects include CircUse (focusing on the environmental impact of economic development by limiting urban sprawl), COBRA MAN (supporting the revitalisation of brownfield sites in order to combat urban sprawl) and UrbSpace (dealing with shaping and revitalising urban open spaces). Common project outputs include tools, strategies and guidelines aimed at local experts and decision makers. The development of an IT tool of the URBAN-SMS project is an excellent example in this respect, as it combines environmental issues with issues of modern communication (ICT). The implementation of physical investments as pilot actions was highly useful, as it provided physical results. Such pilot investments were carried out by, for example, COBRA MAN and UrbSpace. Also, CircUse has developed feasibility studies and actions plans as pilot actions. All three projects were financed under Priority 4 “Enhancing competitiveness and attractiveness of cities and regions”. Still, given their cross cutting agenda they contributed to both Priority 3 and Priority 4 challenges.

As far as **water management** and **flood protection** is concerned, the projects were highly differentiated. REURIS addressed the growing demand for attractive and accessible watercourses (i.e. river channels) in urban areas. In six pilot actions, the project developed sustainable river revitalisation measures, increasing each river’s functions as an ecosystem, an aesthetic element and a flood-protection measure.

The LABEL project developed prevention measures and strategies to adapt to rising flood risk along the Elbe river, while CEframe set up an integrated flood protection management in the catchment area of the Danube, Thaya-Morava and Leitha rivers. Among other things, the project led to a Memorandum of Flood Protection that was signed by the representatives of ministries, regional authorities and water management organisations from four CE countries, with the aim of developing river-specific cooperative strategies. The INARMA project focused on small river basins and managing the risk of flash flooding,

FOKS aimed at mitigating groundwater contamination and URBAN_WFTP supported the efficient water management in urbanised areas.

Many projects used visualisation as a main element of output (e.g. maps), to help the target groups understand and interpret the project results. Also, many projects developed plans and strategies aimed at public-sector decision makers (e.g. the flood risk management plans prepared under LABEL, flood risk assessment under CEframe, or the FOKS project's strategic framework for groundwater risk management). Pilot actions helped in a) solving conflicts between risk management and different land use options (e.g. regional development concepts and management plans of LABEL); or b) ensuring that project results are built on after the end of the project lifetime (Urban Water Footprint Labs of the URBAN_WFTP project).

Projects dealing with **biodiversity** and landscape protection focused on a) the ecological assets of 'no man's lands' and border areas (Greennet), b) developing and managing transnational ecological networks in CE (TransEcoNet), c) promoting 'high nature value farmland' with biodiversity as a valuable resource to help sustainable rural development (SALVERE), or d) nature conservation and heritage preservation (VITAL LANDSCAPES).

A study on 'Environmental risk management and climate change'[318] highlighted the fact that many of these topics should not be taken by countries and regions in isolation. Rather, cooperation between CE regions is an important tool for enhancing cohesion and approaching issues that have spatial development characteristics. The study also shows that important project outputs were the uptake of accumulated knowledge and experience in the preparation and implementation of policies, plans, programmes or strategies, and the establishment of a number of schemes (e.g. memorandums of understanding, charters, business cooperatives, institutional networks and educational or training programmes) to ensure the continuation of the projects results.

Regarding **energy**, CE projects implemented activities to improve the **energy efficiency** of **buildings**, develop regional energy action plans and exploit **renewable energy sources** (through a combination of methodological developments – analysis, best practices, strategies, etc. – tools and pilot actions). Thus, projects created viable policy toolkits for both energy efficiency and renewable energies, covering the tools and actions needed for benchmarking, strategy setting and the provision of ongoing financial and political support. Furthermore, projects have produced a high number of regional energy concepts and strategies promoting renewable energies and demonstrations to raise awareness and secure political buy-in and investment. The activities taken to promote energy efficiency and renewable energy sources are illustrated below.

Starting with **energy efficiency**, CE projects produced a number of targeted **strategies** and **policy actions**. For example, CombinES focused on improving the funding of energy-efficiency measures in CE. For this it developed a new subsidy system, by combining public subsidies with 'energy performance contracting'. EnSURE encouraged refurbishment activities by first developing a joint transnational energy concept. On this basis, it prepared five sustainable energy action plans to encourage municipalities, housing companies, owners, energy providers and other stakeholders to implement energy-efficient urban development actions. As a result, the project formulated a detailed manual and policy recommendations to help other regions integrate sustainable energy into their urban

[318] REC, 2014.

environment. Alternatively, to improve energy efficiency in rural areas, VIS NOVA elaborated five energy-efficiency plans for its partner regions, based on a transnational sustainable energy strategy endorsed by the relevant public authorities in the CE regions.

Good examples of **awareness raising,** knowledge transfer and/or educational project activities are provided by GovernEE, which implemented pilot training events for municipal institutions to raise awareness regarding the challenges of sustainable buildings. These training sessions included in total around 400 people in the project's partner regions. Likewise, EnergyCity has created an online tool that calculates energy performance and losses in homes, and shows potential heating energy savings, hoping to motivate households to invest in energy-efficiency measures, thus improving overall urban energy performance.

Particularly good examples of **knowledge transfer** are: GovernEE, which has collected 35 good practices on sustainable energy use in buildings, and VIS NOVA, which collected four energy-efficiency good practices. The most notable of those refers to Delitzsch, Northern Saxony, which 'developed a strategy, 'Visions of the City of Delitzsch 2015', enshrining the objective of increasing energy efficiency in private households. The City has been self-sufficient since 2010 and is a model example of energy efficiency in an urban environment.'[319]

To promote energy efficiency, CE projects also developed a wide range of **tools and pilot actions**, such as the CEC5 project. It created a tool to assess the energy performance of existing and new buildings (CESBA). CESBA indicators can be used as a planning and assessment instrument over the whole building lifecycle – from planning and conception, to performance monitoring. EnergyCity developed a Spatial Decision Support System, enabling the estimation of energy consumption and CO_2 emissions from buildings so that decision makers and urban planners can map where heat loss is greatest; this recognises areas of high CO_2 emissions to be tackled through energy strategies and energy-efficiency improvements.

Additionally, CoP has developed an IT toolkit for determining renewable energy potentials in urban areas; this facilitates the planning of new investments, by allowing potential investors to verify data on the technical and environmental potential of renewable generation. Meanwhile, LiCEA has created a tool for auditing SME energy performance and GovernEE has set up a monitoring system for assessing public building performance.

Important pilot actions were implemented by a) EnSURE to test and better understand energy-efficient refurbishments and their required framework conditions, b) CEC5 to demonstrate energy-efficiency measures and renewable energies in seven demonstration buildings, c) VIS NOVA to provide sustainable energy to regions.

As far as **renewable energy** is concerned, notable **strategies** were developed by e.g. MANERGY. It drafted six regional energy concepts (RECs) and one handbook on how to produce a REC in other regions. Also, 4BIOMASS prepared recommendations for policy makers and regional authorities for a joint and consistent policy approach to sustainable bioenergy development, while SEBE elaborated a strategy for the sustainable development of biogas production, by determining the potential for the production of biogas, identifying barriers in specific regions and countries, and setting out objectives for

[319] REC, 2104.

the medium and long term to improve use. Likewise, CEP-REC developed regional energy concepts to visualise energy demand and support discussions on energy strategies

CE projects were quite active in raising **awareness**, disseminating **knowledge** and providing **education** on renewable energy. This is illustrated by the COACH BioEnergy project, which established a permanent consultancy network to overcome the underutilisation of available knowledge on biomass technologies and services, particularly in rural areas. Additionally, SEBE established a network of competence knowledge centres (CKCs). The CKC network consists of national contact points and provides access to high-level expertise and technology for players in the biogas market.

Concerning knowledge transfer, CE projects collected in total 118 best-practice models of integrating renewable energy sources. Of these, 20 were collected by RUBIRES and 46 by 4BIOMASS, which used the good practices to elaborate sustainable-energy action plans. A notable best-practice example is the Organic Rankine Cycle CHCP production in Austria. It was the first combined heat and power plant in the world based on an Organic Rankine Cycle (ORC), combined with an absorption chiller for power production and cooling for optimal efficiency. The plant uses waste wood as a feedstock and heat is used in district heating.

Additionally, COACH BioEnergy collected 32 good practices on the use of biomass, including the example of the Ostritz (Germany) biomass heating plant, which is operated as a public–private partnership built on the initiative of the municipality. It works with fuel supplied from the local timber industry and has an overall output of 4 megawatts. Finally, REZIPE also contributed 20 good practices regarding sustainable transport solutions.

Finally, CE projects also developed a set of key tools and pilot actions to promote renewable energy sources. These include the TRANSENERGY project, which collected data on geothermal potentials in deep groundwater systems. From this it produced a web-based tool to support decision making for government authorities, experts and private investors, taking into account geothermal conditions. RUBIRES developed a geographic information system to analyse, describe and evaluate the spatial distribution of unused biomass resources, while 4BIOMASS elaborated a joint management tool to support bioenergy investors by providing overviews of policy frameworks in the partner countries, as well as contacts for implementing agencies and technology and fuel providers.

Pilot actions were included in the DANUBENERGY project, which tested technology for integrated generation of solid fuel and biogas from biomass, and the ENERGYREGION project, which implemented actions to promote wind energy and to test optimised biomass gasification to compare the economic efficiency of combustion parameters. The project also implemented a hybrid power plant, including a wind turbine and a fuel cell. This pilot action was established in Wrocław (Poland).

3.2.4. Priority 4 – Enhancing competitiveness and attractiveness of cities and regions

CE 2007-2013 projects in Priority 4 addressed a wide range of issues, such as **polycentric development**, improved **urban and regional cooperation,** as well as the establishment and improvement of **governance structures**. They also covered territorial issues, like the **ageing of**

society, and supported the preservation of **cultural heritage** to enhance the attractiveness and competitiveness of the CE regions. With their activities, the projects contributed 'significantly to making shrinking regions more attractive, especially through matching local skills with business needs and retaining competences for regional growth. In addition attention is given to adapting services for the younger generations and the ageing society.'[320]

Furthermore, many projects rediscovered and upgraded creative or **cultural resources,** while others supported the revitalisation or reuse of brownfield sites, thus contributing to the economic development of the CE regions. Other projects contributed to increasing the number of **elderly** involved in the labour market or to building up entrepreneurial skills and employment opportunities for local vulnerable groups. Many project activities included developing, identifying and disseminating good practices and tools that serve as a basis for strategies and implementation plans, the implementation of pilot actions such as testing or improving existing or developing new services, and the creation of strong regional networks and permanent management structures.

To give an example of a project focusing on **governance structures**, ACT4PPP worked on innovative governance strategies to promote public–private partnerships at the local level. Its activities included the development and implementation of 12 local pilot projects that initiated a high amount of investment, as well as the development of transnational tools (e.g. a 'PPP Compendium' on recommendations for the use of PPP in urban development). Among other activities, the project also provided a platform for 17 CE cities and regions to exchange experiences and know-how in PPP.

Also, CENTROPE CAPACITY managed to create permanent, high-quality joint management structures for political, administrative and operational issues concerning the Austrian, Czech, Hungarian and Slovak border regions. Part of the project's activities included the development of the Joint Centrope Strategy and Action Plan 2013+, which sets out the strategic priorities for a future Centrope agenda. CENTROPE CAPACITY also developed three transnational tools through pilot actions: a) a regional development monitoring tool, b) an infrastructure needs assessment tool and c) a culture and tourism marketing tool that provided the basis for the development of the future strategy.

Many of the projects aimed at promoting their cultural heritage thereby also developing cultural tourism in the CE regions. For example, CrossCulTour contributed to increasing the attractiveness of cultural heritage sites in its partner regions, by introducing visitor guidance systems and ICT solutions to make cultural sites more easily accessible. Simultaneously it promoted cultural tourism by creating the CrossCulTour Transnational Strategy (based on an analysis of relevant markets, best practices and the cultural-historical background) to get a framework for joint marketing and product development.

Likewise, CUSTODES aimed at developing the socio-economic potential of cultural resources in CE regions. It did so with seven pilot actions that led to the development of common strategies and tools for local governments and business to attract tourist flows. These strategies were shared at the transnational level and implemented in the local context. In similar fashion, LISTEN TO THE VOICE OF VILLAGES was a project to increase the competitiveness and attractiveness of rural marginal areas, by setting up governance tools and pilot actions in the tourism sector. Complementing this is the Cultural Capital Counts project, which focuses on the intangible cultural heritage (e.g. traditions, specific skills or knowledge) as an important but neglected factor in regional development

[320] ERICarts, 2014.

Furthermore, HERMAN aimed at improving the management and valorisation of cultural heritage to fully exploit its economic potential. The project included a number of studies and reports (European benchmark study, background study regarding the legal, financial and administrative background, etc.), the development of a toolbox of management strategies, models and procedures, the creation of stakeholder platforms (management stakeholder platform and local/regional portfolio stakeholder platforms) and the development of local action plans. Finally, the THETRIS project focused on the conservation of local religious monuments in 11 CE partner regions, by creating transnational church routes to strengthen cultural tourism.

Other projects preserving the cultural heritage of CE regions included the Danube Limes project, which focused on creating a common research and marketing methodology for partner regions that would result in successful application for inclusion of the Hungarian and Slovak section of the Danube Limes on the UNESCO World Heritage List. To achieve this, the project developed joint strategies and policy documents, such as an update of the 'Management Plan of Upper German Raetian Limes', which served as a best-practice example for the Hungarian and Slovak management plans. Additionally, ETNOFOLK aimed at collecting, consolidating, evaluating and disseminating digital objects related to various types of 'folk culture' in four Central European countries. For this it developed a common database, with information and standardised metadata related to folk culture (e.g. images, videos or audio). The database was implemented in a multilingual internet portal (http://www.etnofolk.eu), which is still operating.

As far as **economic development** and competitiveness are concerned, Creative Cities established a transnational network of creative industry clusters in CE five cities, to exploit underutilised potentials for economic growth. The project's output included the development of a joint action plan that set out five important areas relevant to the development of creative clusters: networking, education and employment, transfer of knowledge, marketing, infrastructure and financial support. The project also created local implementation plans to facilitate industry cooperation and the creation of clusters. And it established cluster contact points in all partner cities for capacity-building transnational networking.

CENTRAL MARKETS aimed at improving the competitiveness and attractiveness of eight CE cities or regions by developing innovative market revitalisation strategies. The project's activities included preparatory studies (e.g. on laws and regulations), as well as eight pilot actions that involved local stakeholders from policy and business to revitalise traditional markets in the respective cities.

In an interesting approach, the Traditional and Wild project aimed at reviving traditional knowledge of plants, in order to promote their sustainable use for the economic benefit of vulnerable groups (ethnic minorities, women, the elderly and schoolchildren). The project's output includes a capacity-building strategy, with manuals and modules to train the identified target groups in the main aspects of sustainable plant collection and utilisation activities. This helped to develop their entrepreneurial and marketing skills and enhance employment opportunities. The project also created a database of available plants, with details and particulars on how plants were traditionally used in the partner regions. Additionally, the project realised small-scale investments for the processing of plants and a demonstration laboratory, and developed guidelines for product certification of collected wild plants.

A number of projects dealt with challenges related to demographic change, like the labour market implications of **ageing**. Two examples are the CE-Ageing Platform and the Senior Capital project. The

CE-Ageing Platform developed solutions to tackle the challenges of an ageing society. The project created and implemented the CE-Ageing Strategy. It aimed to a) minimise the negative effects and impacts of demographic trends on society and the economy, b) initiate regional platforms and new cooperation models, and c) upgrade the skills of employees aged 45+. Similarly, Senior Capital focused on improving the competences of elderly employees via the creation and dissemination of knowledge and the implementation of pilot actions. Notably, as this project was supported under Priority 1 (innovation), it gives a good example of the cross-cutting

Territorial challenges linked to shrinking population were addressed for example by the EURUFU project, which focused on the future viability of rural areas. Amongst other activities, it included awareness-raising events (dialogues, conferences, etc.) to capture the attention of (especially political) stakeholders. ,. In this project, the involvement of policy makers at the national, regional and local level, as well as of chambers (e.g. of physicians or of insurance companies), led to the launch of a pilot action 'Ambulatory Medical Care in the Kyffhaeuser District',[321] which guarantees a sustainable outpatient medical service in the region.[322] Other CE projects dealing with similar challenges include QUALIST that aimed to increase the attractiveness of small towns, the ADAPT2DC project, which developed transnational strategies regarding public infrastructure and services to reduce the maintenance and provision cost in regions and cities with shrinking population. In addition the projects HELPS and AGEING focussed on reducing economic and social disparities caused by population ageing especially in urban areas.

A number of projects centred around revitalising old industrial sites. Thus, ReSOURCE focused on improving the competitiveness and attractiveness of former mining regions by collecting best-practice examples and developing guidelines. The project produced a post-mining knowledge database and handbook on post-mining potentials in CE. SECOND CHANCE supported the revitalisation of five brownfields sites in Nuremberg, Leipzig, Venice, Kraków and Ljubljana through pilot actions promoting cultural activities. To ensure the sustainability of each action, the project took an explicit PPP approach, resulting in the creation of a site-specific PPP model and a PPP concept for the revitalisation of post-industrial sites. This project was thematically related to the SHIFT-X project, which aimed at upgrading industrial heritage to support economic development by improving cultural heritage management, creating new heritage-based products and changing the perception of former industrial places.

Also, ReNewTown focused on reducing the disparities in the quality of the urban environment (defined as public spaces between blocks of flats and public buildings in industrial districts) of post-socialist cities. Its activities included the development of three tools (market-research reports, good-practice reports and a database of good practices) and the implementation of four pilot actions to solve local problems in certain districts in Kraków, Prague, Velenje (Slovenia) and Hnúšťa (Slovakia).

3.3. INPUTS AND PRIORITIES OF THE INTERREG CE PROGRAMME 2014-2020

This part analyses the inputs and priorities of the Interreg CE Programme 2014-2020, using data on financial inputs and information on the focus of CE projects. The analysis includes information from the main programme documents, as well as from the CE projects that have been approved in the

[321] A district in central Germany, located on the border of the state of Thuringia and Saxony-Anhalt.
[322] PAU, 2014

programme's first and second calls. Currently, decisions are being taken regarding the funding of third-call projects, while a fourth-round call for projects will be held in 2019.[323]

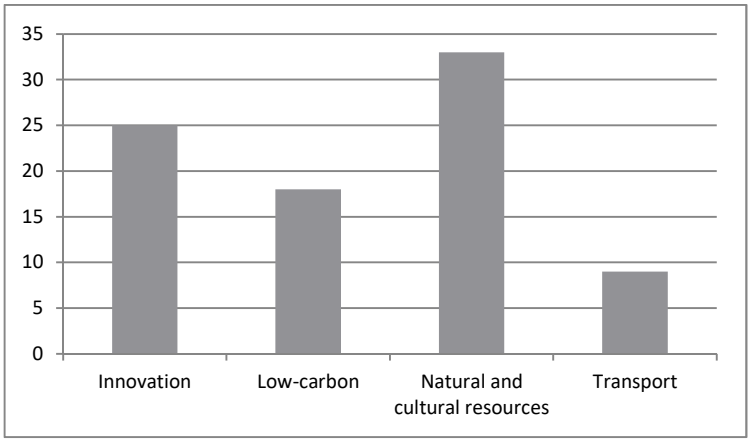
The total ERDF funds available for the Interreg CE Programme 2014-2020 are slightly more than EUR 246.5 million, which are allocated to five priority axes:

1. Cooperating on innovation to make Central Europe more competitive (Innovation) – EUR 69 million or 28% of total ERDF contributions,
2. Cooperating on low-carbon strategies in Central Europe (Low carbon) – EUR 44 million or 18% of total ERDF contributions,
3. Cooperating on natural and cultural resources for sustainable growth in Central Europe (Natural and cultural resources) – EUR 89 million or 36% of total ERDF contributions,
4. Cooperating on transport to better connect Central Europe (Transport) – EUR 30 million or 12% of total ERDF contributions.

Additionally, technical assistance (Priority Axis 5) is supported with around EUR 15 million or 6% of total ERDF contributions.

At the present time, the Interreg CE Programme is funding 85 projects with around EUR 160 million ERDF. The distribution of projects across the priority axes is illustrated in Figure 3.13. It shows that the highest number of projects (33 – 39% of the total number of projects) are funded on the 'Natural and cultural resources' priority axis. The 'Innovation' axis accounts for 25 projects (29% of all projects); the 'Low carbon' axis for 18 projects (21%); and the 'Transport' axis for 9 projects (11%).

Figure 3.13 / Number of projects by priority axis, Interreg CE Programme 2014-2020 (first and second calls)



Source: MA Interreg CENTRAL EUROPE programme.

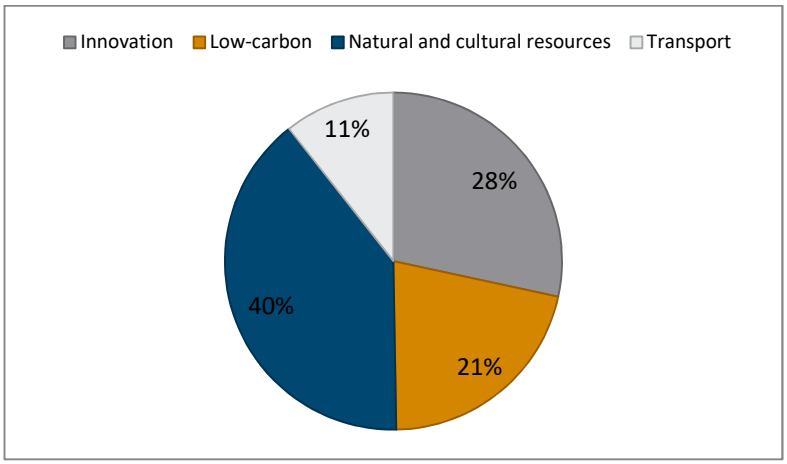
The distribution of funds across the priority axes is shown in Figure 3.14. Thus, the aggregate funds allocated to the projects on the 'Natural and cultural resources' axis are slightly more than EUR 63 million (40% of total funds allocated so far). Funds allocated to the 'Innovation' axis amount to around

[323] See http://www.interreg-central.eu/Content.Node/discover/programme.html

EUR 45 million (28%) and on the 'Low carbon' axis to EUR 34 million (21%). EUR 17 million (11%) were allocated to the transport axis.

The strong similarity in the percentage shares of projects and of ERDF funds by priority axis indicates that the average size of projects across all the axes is approximately equal.

Figure 3.14 / Distribution of ERDF funds across priority axes, Interreg CE Programme 2014-2020 (first and second calls)

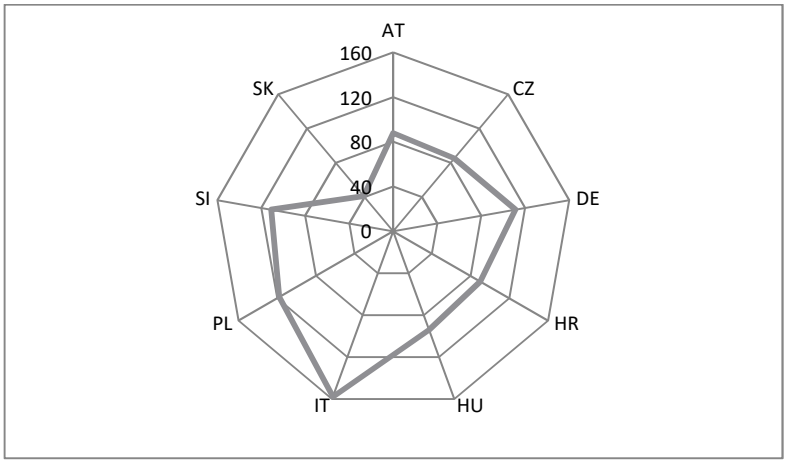


Source: MA Interreg CENTRAL EUROPE Programme.

Breaking down the number of project partners by CE countries[324] shows that the highest number of project partners is recorded in Italy (158), Poland (118), Slovenia and Germany (111) each. The number of project partners in the Czech Republic, Austria, Croatia and Hungary ranges from 85 to 94, and only Slovakia has significantly lower project participation, i.e. 41 partners (see Figure 3.15).

[324] Without countries outside the programme area participating in some Interreg CE projects, like Belgium and Spain.

Figure 3.15 / Number of project partners, by country, Interreg CE Programme 2014-2020 (first and second calls)



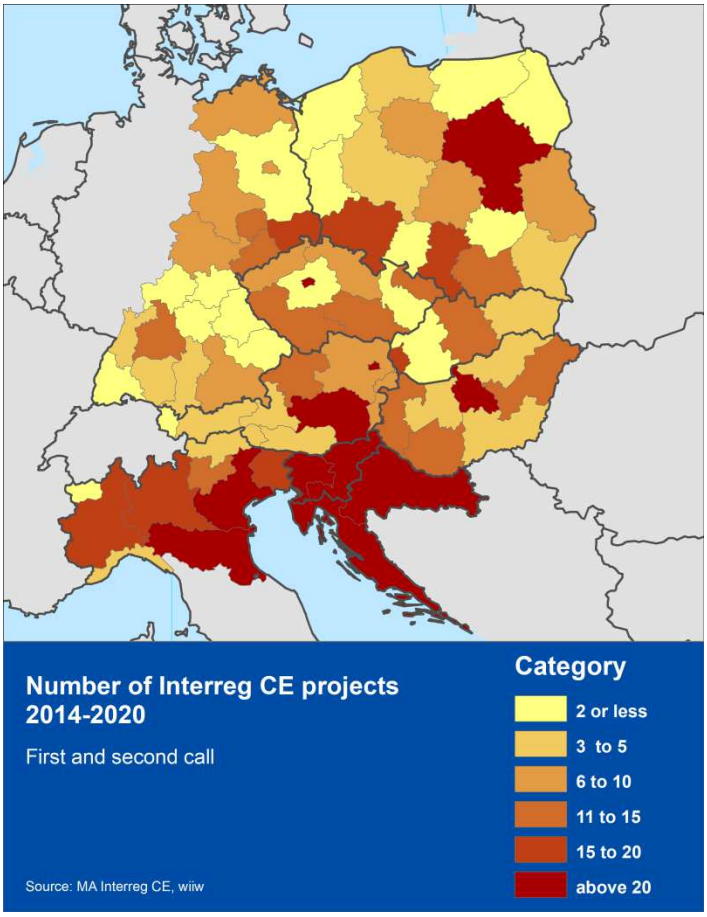
Source: MA Interreg CENTRAL EUROPE programme.

The distribution of project partners across Interreg CE NUTS-2 regions is illustrated in Figure 3.16. It shows the strong participation of Slovenian, Croatian and many Italian regions. Furthermore, as in the CE 2007-2013 Programme, the geographical project distribution favours big cities, as they are the administrative, business, educational and research centres of their countries.

So far, the projects under **Priority 1** (Innovation) focus on the following thematic areas: a) competitiveness, b) networking and cooperation, c) health, d) social innovation and e) governance structures.

Regarding **competitiveness,** project examples include AMiCE, which promotes advanced manufacturing technologies, focusing especially on 3D printing, and ENTeR, which focuses on waste reduction (by strengthening the innovation capacity) to prevent depletion of non-renewable resources in the textile industry. Furthermore, FabLabNet supports fabrication laboratories, i.e. small-scale workshops offering digital fabrication, while CERIecon promotes entrepreneurship in general. URBAN INNO addresses the challenge of making CE more innovative and competitive by raising the innovation potential of small and medium sized urban ecosystems.

Figure 3.16 / Number of projects by NUTS-2 regions, Interreg CE Programme 2014-2020 (first and second calls)



Source: MA Interreg CENTRAL EUROPE programme.

Priority 1 - Innovation

ENTER-transfer addresses the neglected issue of business succession, and intends to develop tools and services that will streamline the business-succession process and help sustain family businesses. I-CON aims to improve entrepreneurial competences and skills in the food industry in remote areas. InnoPeer AVM focuses on developing and testing a first comprehensive, transnational advance manufacturing (AVM) qualification programme for innovation managers and owners of small companies. Finally, the THINGS+ project aims at service innovation processes in manufacturing companies to enrich their portfolios with additional services that increase the value of their goods produced and thus improve their position on the market.

The projects focusing on **networking** are 3DCentral (which aims at connecting 'islands of innovation' to a stable network of regions), BIOCOMPACK-CE (which focuses on providing stronger linkages between R&D institutions and companies in the area of paper–plastics packaging solutions), KETGATE (which brings together business support organisations and applied research institutes to help SMEs access high-technology services) and SYNERGY (which seeks to strengthen underdeveloped linkages,

cooperation and synergies between companies, industry, research, intermediaries and policy makers in selected industries).

As far as **health** is concerned, the digitalLIFE4CE project is looking for novel solutions in the field of digital integrated healthcare systems, to reduce the fragmentation of CE healthcare systems. The Focus in CD project concentrates on the development and pilot testing of an innovative health service model in the management of celiac disease, while the INTENT project tries to find solutions for innovative patient-centred cancer care, involving cancer care providers, patients and policy makers.

Projects aimed at improving **governance structures** are a) NUCLEI (which focuses on changing the obsolete innovation management model from a 'locally based' technology-scouting approach to a transnational pool of knowledge, b) PPI2Innovate (which targets public procurers on all administrative levels in CE, with the aim of building regional capacities in the public procurement of innovative solutions), c) SMART-watch (which will develop a model for regional branch observatories equipped with a set of monitoring and benchmarking tools, available to all regional innovation strategy stakeholders and intelligent markets' actors), d) TRANS³Net (which aims at shaping conditions for building up a well-functioning innovation system in the tri-nation region of Germany, the Czech Republic and Poland) and finally e) CROWD-FUND-PORT (which focuses on making crowdfunding available to economically weaker businesses that do not have access to bank loans, but that would be able to launch business ideas through crowdfunding).

Social innovation is supported through the projects: a) ROSIE (designed to improve the skills of entrepreneurs and innovation actors to promote responsible innovation in companies), b) SENTINEL (which aims to develop solutions for social enterprises regarding skills development, mentoring and cooperation), c) INNO-WISEs (which connects actors from work-integration social enterprises, research, technological experts and relevant public authorities to improve the capacity of SMEs working on the integration of disadvantaged people in order to provide jobs) and Social(i)Makers (focussing on improving social innovation capacities by working with financiers, entrepreneurs, policy makers and citizens on how to generate new socio-economic systems as a bottom-up result of their interactions).

Priority 2 – Low carbon economy

Priority 2 (Low-carbon) projects focus mainly on three topics: energy efficiency and low-carbon economy; sustainable and renewable energy; and governance structures. **Energy efficiency and a low-carbon economy** is covered, for instance, by the Dynamic Light project (which seeks to introduce a modern energy-efficient and demand-oriented lighting design and better light and energy management to CE municipalities). The REEF2W project plans to develop and implement energy-efficiency solutions and renewable energy production in public infrastructures. This will be done by combining and integrating the public infrastructure of the municipal solid-waste chain with wastewater treatment plants, and by upgrading their input mix and their energy outputs.

Additionally, LAirA addresses the multimodal, smart and low-carbon mobility integration of airports in the mobility systems of functional urban areas, and the LOW-CARB project intends to enhance capacities for low-carbon mobility planning for functional urban areas. MOVECIT seeks to make transport more sustainable by developing mobility plans for CE communities to change the commuting and business travel habits of their employees. SOLEZ brings together cities working on low-carbon mobility solutions

to enhance their strategies and develop smart services and products around the concept of low emission zones (LEZ) in functional urban areas.

Renewable energy projects are: a) CE-HEAT, which plans to improve the governance of energy efficiency, especially with respect to waste heat utilisation, b) RURES, which exploits the potential of renewable energies and energy efficiency in rural regions, and c) GeoPLASMA-CE, which addresses geothermal utilisation.

Energy governance structures are targeted by: a) BOOSTEE-CE, which equips public authorities with tools and methodologies for proper energy management (especially public buildings), b) eCentral, which supports key stakeholders in gaining a better understanding of the benefits of nearly zero energy buildings (nZEB), c) ENERGY@SCHOOL, which aims to increase the capacity of the public sector for implementing energy-smart schools, d) FEEDSCHOOLS, which seeks to provide local authorities with new solutions, both technical and financial, to implement nZEB renovation activities in schools, e) TOGETHER, which offers a transnational capacity-building platform for energy efficiency in public buildings, f) CitiEnGov, which improves the capacity of public administrations to implement new energy planning strategies, g) FIRECE, which increases the capacities of regional operators to better manage energy plans, particularly in terms of locally available financial resources, h) SMART COMMUTING, which will foster coordination structures at the urban area level to enhance planning and coordination of commuting-related policies and i) SULPiTER, which will enhance policy makers' capacity in urban freight mobility planning, in order to develop and adopt sustainable urban logistics plans.

Priority 3 – Natural and cultural resources

Priority 3 (Natural and cultural resources) projects focus on biodiversity, environmental sustainability issues, governance structures and cultural heritage. **Biodiversity** is covered by 3Lynx, which is improving lynx conservation capacities, and SUSTREE, which promotes the climate-change adaptation of forest ecosystems, by fostering and enabling transnational adaptive management of forest genetic resources.

Environmental sustainability issues are addressed by FramWat, which strengthens the regional common frameworks for floods, droughts and pollution mitigation by increasing the buffer capacity of the landscape. Similarly, RAINMAN tries to improve the integrated management capacities of public authorities to mitigate heavy rain events and to reduce health and environmental damage. AMIIGA wants to reduce groundwater contamination, while PROLINE-CE focuses on improving the protection of drinking-water resources, as well as safeguarding regions against floods and droughts using an integrated land use management approach. Air pollution is addressed by InAirQ (indoor air quality), AIR TRITIA (improving air quality management capacities) and AWAIR (improving environmental management capacities). Finally, STREFOWA will address and improve food waste management in CE urban areas and SURFACE will improve environmental management in urban areas.

Governance structures are covered by the CIRCE2020 project, which facilitates the uptake of integrated environmental management approaches in five CE industrial areas by developing an integrated redesign of industrial interactions based on the circular economy. MaGICLandscapes will increase the institutional capacities regarding the 'green infrastructure concept' and draw up strategies and tools to protect and further develop the existing 'green infrastructure' in CE regions. CEETO promotes eco-tourism, LUMAT

implements sustainable land use and pilot projects with respect to integrated environmental management and GreenerSites improves the environmental management of industrial areas. Urban Green Belts will develop innovative methods and tools for integrated models of smart management of urban green spaces.

Cultural heritage in the CE territory is addressed by 16 projects in total: ARTISTIC, BhENEFIT, SlowFood-CE, COME-IN!, CULTURECOVERY, ECRR, Forget Heritage, InduCult2.0, HICAPS, NewPilgrimAge, REFREsh, ProteCHt2save, RESTAURA, RUINS, VirtualArch and YouInHerit. The focus of these projects is as follows:

- ARTISTIC: Improve cooperation between cultural operators, citizens and financial operators;
- BhENEFIT: Improve the management of historic built areas, combining the daily maintenance of historic heritage with its preservation and valorisation in a sustainable way;
- SlowFood-CE: Improve the capacities of local actors to valorise the intangible heritage of food in line with a vision of integrated economic, environmental and social sustainability;
- COME-IN!: Promote open access to small- and medium-sized museums to a wider public of people with different kinds of disabilities;
- CULTURECOVERY: Improve capacities of eco-museum managers and operators;
- ECRR: Establish a European Cultural Route of Reformation by identifying, selecting, and connecting existing Reformation-themed cultural heritage sites, objects, and non-material legacies;
- Forget Heritage: Promote cooperation to identify innovative replicable and sustainable private public cooperation management models for abandoned historical sites;
- InduCult2.0: Promote the idea of Living Industrial Culture in Central Europe and reveal, strengthen and utilize the cultural spirit of industrial regions;
- HICAPS: Develop 8 concepts to revitalize 8 different castle parks;
- NewPilgrimAge: Promote the European Cultural Route of Via Sancti Martini;
- ProteCHt2save: Improve capacities of the public and private sector to mitigate the impacts of climate change and natural hazards on cultural heritage sites;
- REFREsh: Revitalise unused industrial heritage in rural regions;
- RESTAURA: Promote good practices regarding the use of Public-Private Partnerships (PPP) for the revitalisation of historical cities and buildings;
- RUINS: Revitalise medieval ruins through modern management and give them new, contemporary and socially useful functions.
- VirtualArch: Unveil regional archaeological heritage – located underground or submerged, to local and regional stakeholders responsible for economic development;
- YouInHerit : Support the valorisation and revival of traditional trades and crafts as cultural heritage to make urban regions more attractive and competitive.

Priority 4 - Transport

Priority 4 (Transport) projects focus on accessibility, TEN-T and multimodality issues. Accessibility projects are: a) CONNECT2CE (which tackles the weak accessibility of regional, peripheral and cross-border areas of CE and seeks to connect them to main transport networks and hubs), b) Peripheral Access (which intends to improve the accessibility of rural, remote areas by working on multimodality and integrated transport, the use of intelligent communication technology and better cooperation

between transport associations, including cross-border marketing), c) RUMOBIL (which supports TNC of public authorities and their transport institutions) and d) TRANS-BORDERS (which seeks to improve railway links – or alternatively bus lines – in the peripheral regions).

Two projects focus on the **TEN-T** Core Network. SubNodes concentrates on tackling the weak intermodal integration of the urban hinterland regions to primary TEN-T hubs. And the TRANS TRITIA project intends to make transport networks, multimodal logistic centres and environmentally friendly freight transport in the Polish, Slovak and Czech border territory more effective.

As far as **multimodality** is concerned, ChemMultimodal promotes the multimodal transport of chemical goods, and TalkNET improves the coordination of stakeholders to foster the integration of ports, inland terminals and transport operators.

3.4. QUESTIONNAIRE RESULTS

This section analyses the results of a questionnaire[325] that was sent out to all beneficiaries of the CE 2007-2013 Programme (more than 1,100 project partners). The survey was designed to provide answers to the questions regarding a) the sustainability of CE 2007-2013 projects beyond their lifetime, b) the long term effects of the projects, c) the stakeholders benefitting from those effects, d) the reasons for the effects as well as e) potential effects for the project partners themselves (for example: new cooperations).

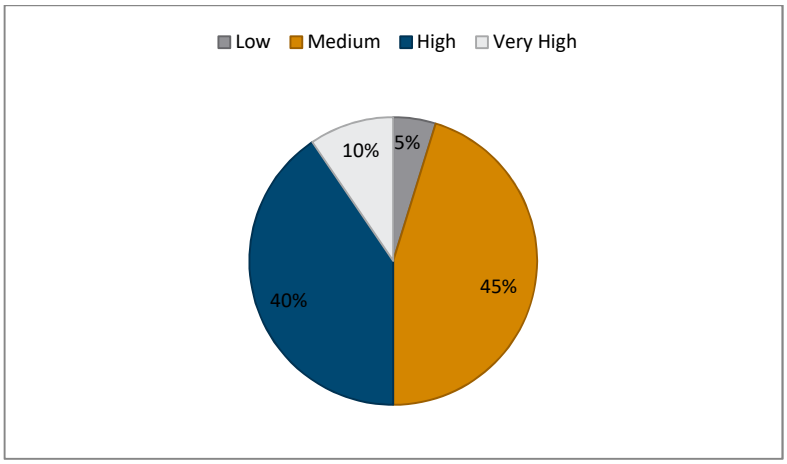
In total 84 responses were received, resulting in a response rate of around 7.5%. The responses covered 60 out of the total 124 CE 2007-2013 projects (48) so that the survey can be considered moderately representative. The distribution of responses across the priority axes was slightly skewed towards Priority 4:

- Priority 1: Facilitating innovation across Central Europe – 17 responses (20% of total)
- Priority 2: Improving accessibility to, and within, Central Europe – 17 responses (20% of total)
- Priority 3: Using our environment responsibly – 22 responses (26% of total)
- Priority 4: Enhancing competitiveness and attractiveness of cities and regions – 28 responses (33%).

Analysis of the responses shows the following.

The overall impact of the CE 2007-2013 Programme was considered as positive. For 45% of respondents the impact was medium, while every second beneficiary considered the projects' impacts as either high or even very high. Only 5% of the respondents judged the impact of their project as low (see Figure 3.17).

Figure 3.17 / Perceived overall impact of the project by project partners



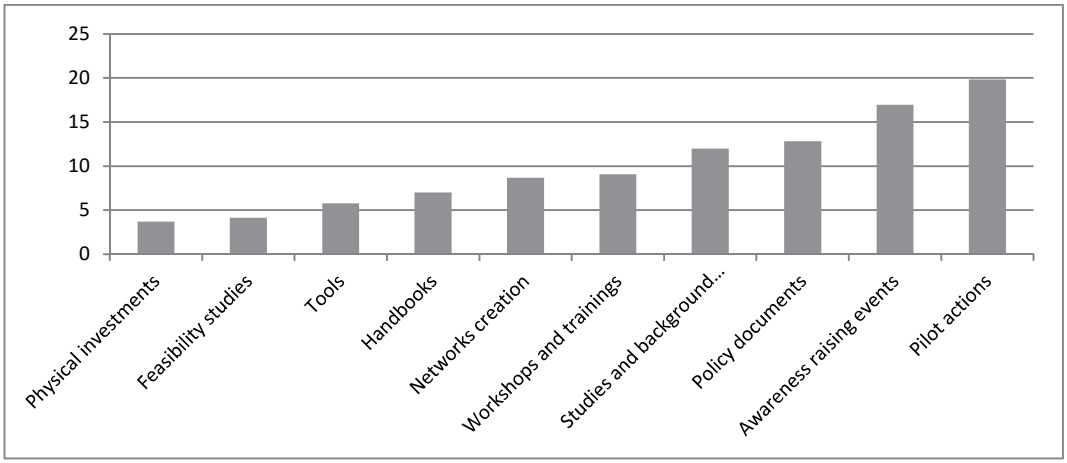
Source: wiiw.

[325] The questionnaire is provided in the Annex.

According to the results of the survey, the most important outputs of the CE 2007-2013 projects were pilot actions (19% of responses), followed by awareness raising events, the production of policy documents and studies. The least relevant outputs were direct physical investment and feasibility studies (see Figure 3.18). However, only a limited number of projects actually included physical investments, the more so as it was not the Interreg programmes main aim to implement investments (this is done by other ERDF financed programmes). Mostly, investments in an Interreg context were of a high demonstrative or experimental character. Generally, this survey results corresponds to above analysis, especially with respect to the importance of pilot actions that in many projects were successfully used for showcasing potential policy options or solutions and thus to secure policy buy-in.

As far the outputs in general are concerned, those outputs are considered to be more relevant that had some impact on policy making, e.g. through a) the demonstration effect of pilot actions, b) direction attention to certain problems by awareness raising events or c) the creation of documents providing guidelines for actual policy making. Other outputs, such as tools or handbooks were less common, partly because of the design of the project, but potentially also because of the work-effort needed to create useful tools or handbooks. Still examples, like the INCA-CE project show, that even if the number of tools might have been low, that some of them very extremely useful.

Figure 3.18 / Most relevant outputs produced by projects, as % of total outputs given in the survey



Source: wiiw.

The next part of the survey focussed on the a) economic, b) institutional and c) governance effects of the CE 2007-2013 projects.

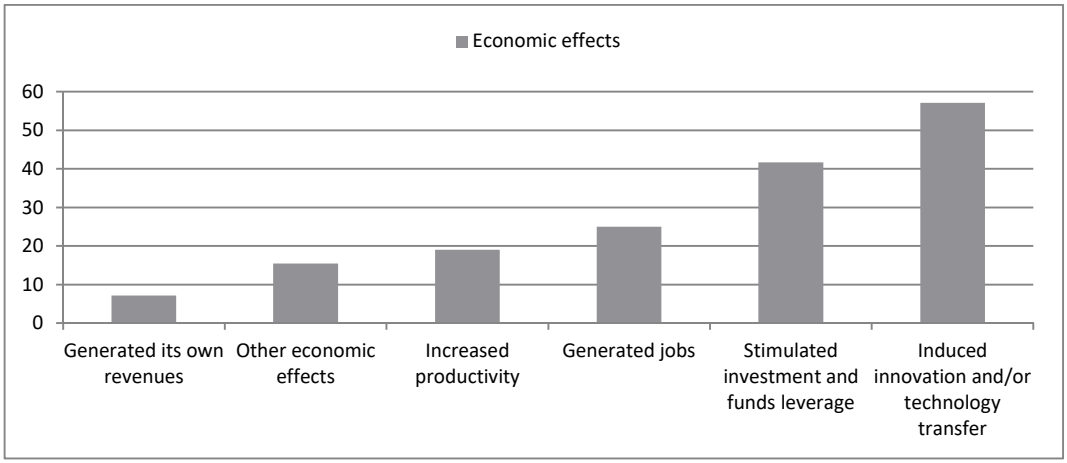
As far as the economic effects are concerned, survey results suggest that in more than half (i.e. 57%) of the CE territories addressed CE 2007-2013 projects led to technology transfer and/or supported of innovation. Investments were stimulated in around 40% of the CE regions. Thus, while many CE 2007-2013 projects did not generate investment themselves (also due to their comparatively small budgets), they were highly important in providing the basis for investment financed by other sources, like the funds available for TEN-T infrastructure (see e.g. the BATCo project). Employment was created in around

25%, while productivity was increased in 20% of the CE regions. Oppositely, only a small number of regions (7%) benefitted from revenues generated by projects (see Figure 3.19).

Additional economic effects that were mentioned are:

- Indirect effects through the flood risk management, i.e. reduction of potential damages;
- Increase in tourism
- Start of small businesses in the creative sector through projects' impacts.
- Lower maintenance costs of infrastructure through its modernisation
- Creation of B2B opportunities
- Improvement of soft location factors
- Additional RTD Projects
- Reduction of out-migration of women.
- Creation and intensification of networks
- Re-use and redevelopment of a run-down building into a museum
- Reformulation of rural development policy based on the good practices identified within a project.
- Better understanding and thus higher efficiency in cluster management.

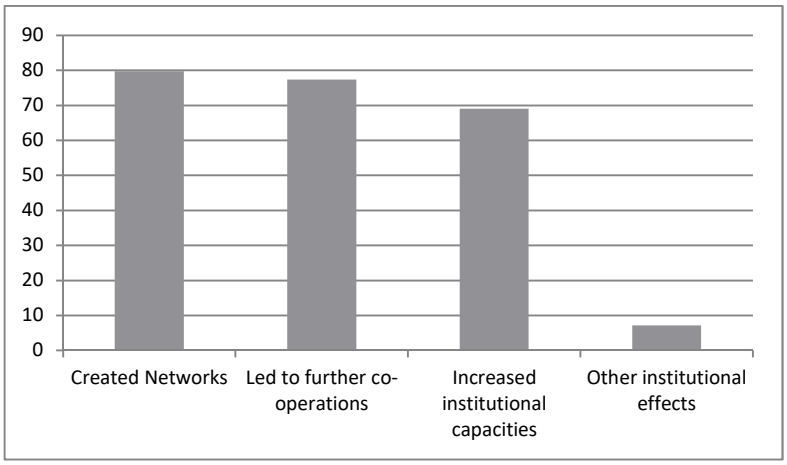
Figure 3.19 / Main economic effects of projects , in % of total survey answers



Source: wiiw.

Many projects had a high impact at the institutional level. Eighty percent of the respondents answered that through their CE 2007-2013 projects they were able to create or participate in a network of institutions. Still, given that most projects included a high number of partners, such creation of networks could be expected to follow naturally - based on the design of CE 2007-2013 projects. What is more, CE 2007-2013 projects also led to a high number of further co-operations as reported by 77% of survey respondents as well as to a significant improvement of institutional capacities for almost 70% of the beneficiaries (see Figure 3.20). Thus, CE projects triggered institutional effects going beyond those that could be expected from the projects' designs. Additionally, it can be assumed that many of those further created co-operations as well as the capacity improvements have a longer run positive impact on the respective territories, extending the projects' institutional effects much beyond their actual lifetime.

Figure 3.20 / Main institutional effects of the projects, in % of total survey answers



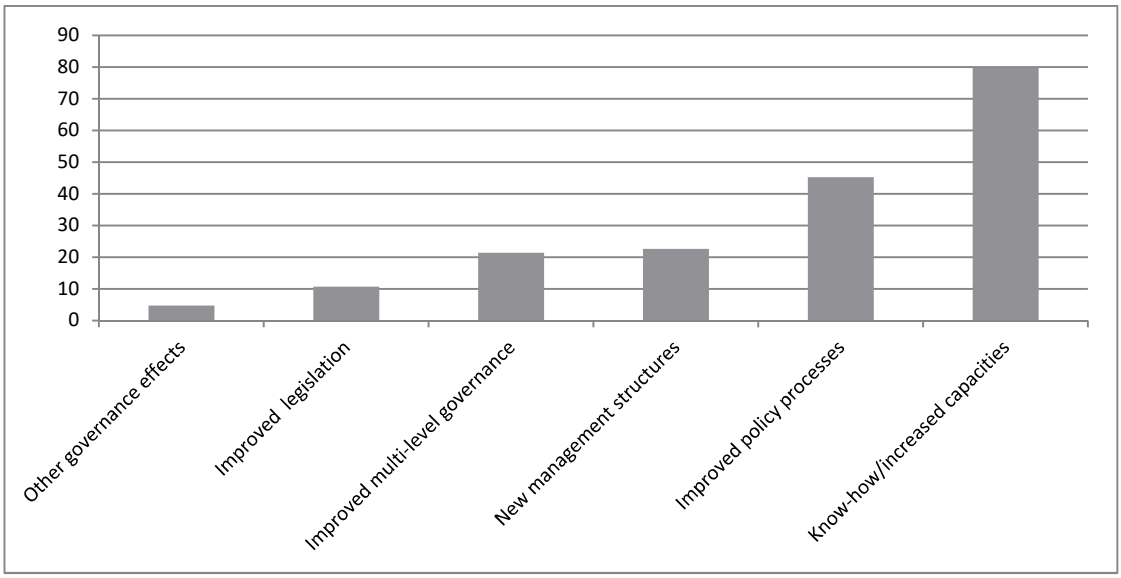
Source: wiiw.

Additional institutional effects mentioned were:

- Political support for electro-mobility, and
- Take-up of housing for older people in the ministry's strategy, resulting in the start of a national campaign.

On the governance side, CE 2007-2013 projects were especially suited to improve the know-how and capacities of local or regional policy makers, as stated by around 80% of the respondents. Furthermore, 45% of the respondents reported that the projects led to improved policy processes in their territories. In addition, CE projects led to new management structures in 22% of the territories and in 10% of the cases to changes in legislation (see Figure 3.21). Given that such changes in structures or even legislation are usually the result of long preparatory processes, the effect of the relatively small CE projects in this respect is quite remarkable, and together with the more frequent governance effects illustrate the benefits of TNC and the exchange of knowledge, the pooling of resources it includes.

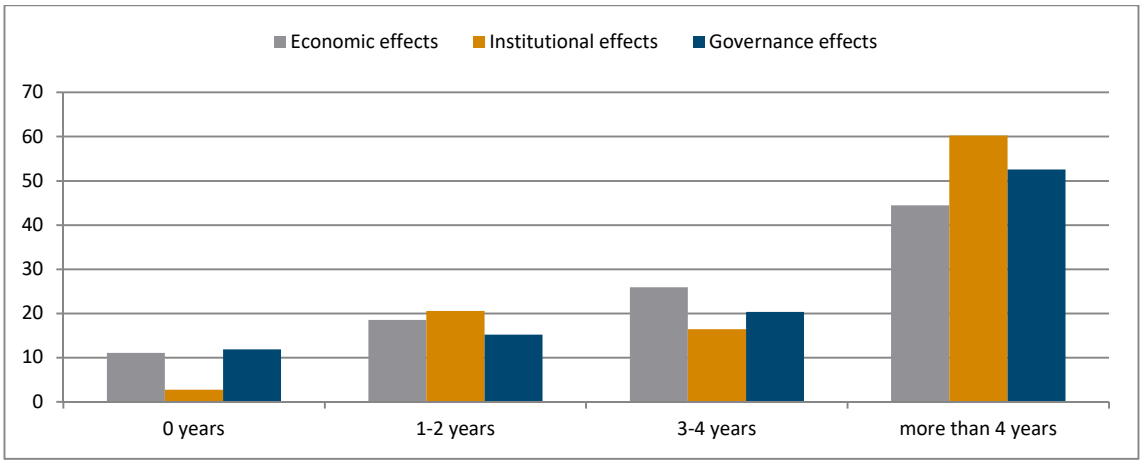
Figure 3.21 / Governance effects of the projects, in % of total survey answers



Source: wiiw.

As far as the durability of the projects' outputs and results are concerned, around 90% of the survey respondents stated that the CE 2007-2013 projects effects were visible at least 1 year after the projects' lifetimes. Even more, around half of the beneficiaries experienced positive long run effects of the projects, i.e. effects lasted four or more years after the end of the project. Thereby, the most common long run effects were institutional effects (reported by 60% of the respondents), followed by governance effects (ca. 53% of the respondents) and economic effects (see Figure 3.22). This confirms again the high sustainability of CE projects' outputs.

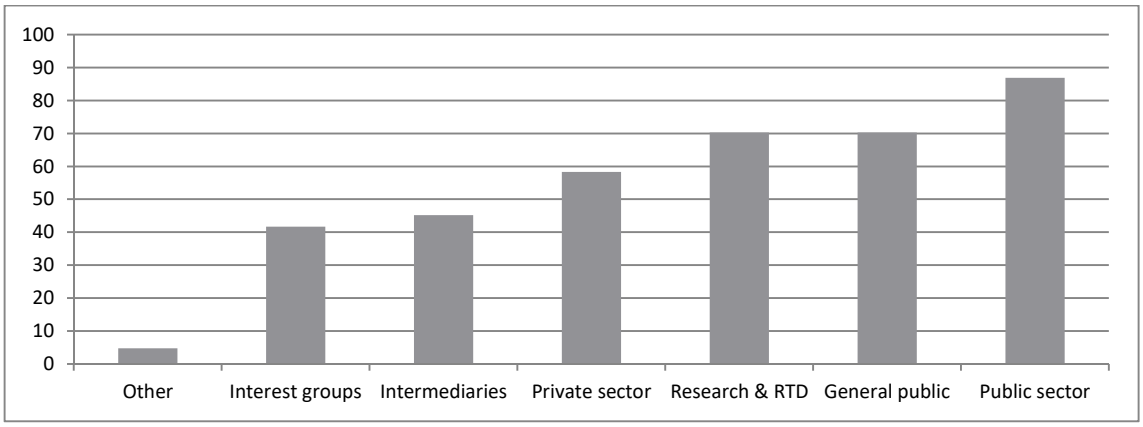
Figure 3.22 / Durability of effects, in % of survey answers



Source: wiiw.

The main group of stakeholders affected by CE projects were from the public sector, i.e. national, regional and local authorities) according to the opinion of the responding project participants (87%). CE projects were also important in influencing the general public, the research community (universities, colleges, research institutions, RTD facilities, research clusters), and the private sector (businesses, SMEs). Less affected were intermediaries (business support organisations, like chamber of commerce, chamber of trade and crafts, business incubator or innovation centre, business clusters) or interest groups (trade union, foundation, charity, voluntary association) (see Figure 3.23).

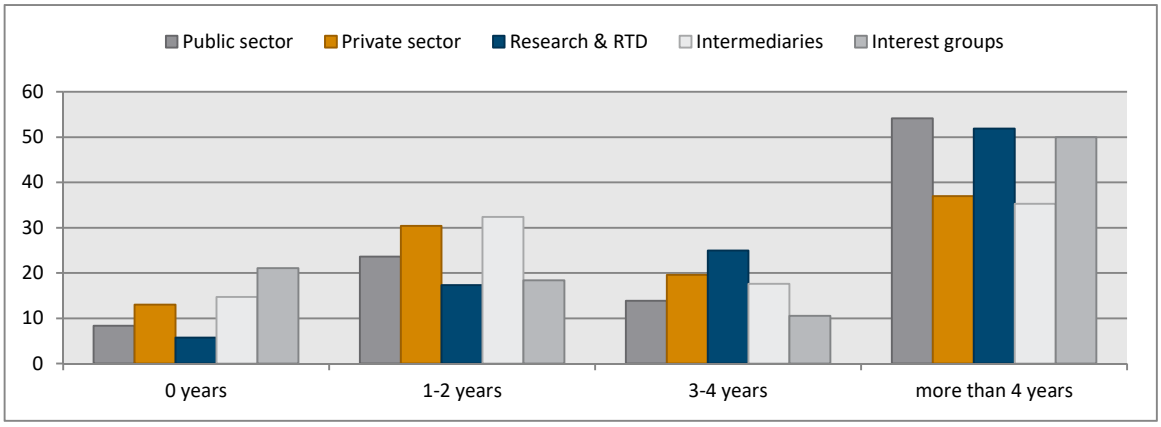
Figure 3.23 / Main stakeholders affected by projects, in % of total survey answers



Source: wiiw.

Regarding the durability of the projects' effects on stakeholders, the answers correspond strongly, to the overall durability of project effects above. Thus, for all stakeholder groups, except interest groups, the projects influence lasted at least one year after projects had ended (see Figure 3.24). In addition, many times the projects had long run, if not permanent effects on the stakeholders, especially in the public as well as for the research sector and other interest groups. More than one third of project participants observed long run effects on the private sector or intermediaries.

Figure 3.24 / Durability of relevant effects on stakeholders, in % of survey answers

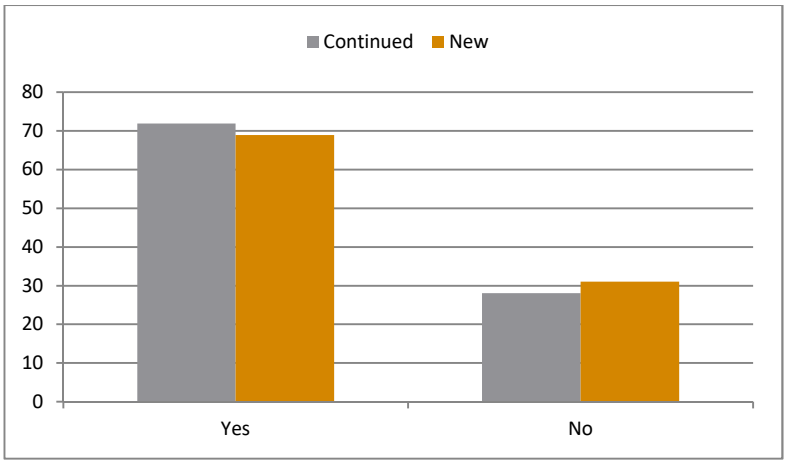


Source: wiiw.

Finally, for the majority of respondents, cooperation continued beyond the lifecycle of the project (i.e. 70% of responses), and new cooperation opportunities opened up because of the CE project (60% of responses) (see Figure 3.25).

Combined with all other answers, this illustrates that the CE 2007-2013 projects had a positive impact on their territories, both in a governance and institutional and many times in an economic context. Their high sustainability and visibility going well beyond the projects' lifetimes multiplies the value of these effects. Even more, the questionnaire also shows that cooperation did not stop at the end of the projects, but rather that the CE 2007-2013 Programme lead to further and new co-operations, thus providing a substantial leverage to TNC in the CE territory.

Figure 3.25 / Continued or new cooperation after the end of the project, number of survey respondents, in %



Source: wiiw.

3.5. CASE STUDIES

This step provides an analysis of 12 project case studies of the CE 2007-2013 Programme. The aim is to deepen the previous analysis of achievements by providing detailed information on the case studies' objectives, outputs and achievements. The case studies were done via desk research of available project documents such as their final report or application form. Additional information was obtained by interviews with former project lead partners and other project participants. The case studies were selected to provide a representative sample of CE 2007-2013 projects in terms of a) covered topics, priorities and areas of interventions, b) home countries of the projects' lead partners as well as in terms of c) the main type of project outputs.

Each case study is split into a technical and a story-telling part. The **technical part** analyses in detail the objectives, outputs and achievements of the 12 projects. Specifically, the analysis focuses on:

- The projects' impacts on policy formulation and adoption at various levels of governance in and outside the projects' core regions;
- The sustainability of the projects' outputs in terms of whether projects continued to exist beyond the CE 2007-2013 Programme lifecycle;
- The extent to which projects stimulated additional investments or initiatives (outside the projects' sphere);
- The projects' impact on governance structures, especially in the context of transnational cooperation, thus improving the functionality of the CE territory;
- The concrete benefits for beneficiaries or specific target groups or the general public.

The **second part** of the case study, 'translates' the more technical first part into a **project story**. The purpose of these stories is to make the projects – and thus the impacts of the whole CE 2007-13 Programme – intuitively accessible to a wider range of stakeholders of the CE Programme. The selected 12 case studies are:

Table 3.1 / Project case studies by priority axes and Areas of Intervention

Acronym	Title	Index	Priority	Area Of Intervention
PROINCOR	Proactive Innovation Support for SMEs in the Corridor from the Baltic to the Mediterranean Sea	2CE199P1	Priority 1	1.2 Establishing Capabilities for the Diffusion and Application of Innovation
I3SME	INTRODUCING INNOVATION INSIDE SMEs	1CE080P1	Priority 1	1.2 Establishing Capabilities for the Diffusion and Application of Innovation
i.e. SMART	SMART Training Network for Innovation and Entrepreneurship in Emerging Sustainable Economic Sectors	4CE429P1	Priority 1	1.3 Fostering Knowledge Development
BATCo	Baltic-Adriatic Transport Cooperation	2CE152P2	Priority 2	2.1 Improving Central Europe's Interconnectivity
TROLLEY	TROLLEY - Promoting Electric Public Transport	2CE121P2	Priority 2	2.3 Promoting Sustainable and Safe Mobility
REURIS	REvitalization of Urban RIver Spaces	1CE050P3	Priority 3	3.1 Developing a High Quality Environment by Managing and Protecting Natural Resources and Heritage
LABEL	LABEL - Adaptation to flood risk in the LABE-ELbe river basin	1CE037P3	Priority 3	3.2 Reducing Risks and Impacts of Natural and Man-made Hazards
MANERGY	Paving the way for self-sufficient regional energy supply based on sustainable energy concepts and renewable energy sources	3CE350P3	Priority 3	3.3 Supporting the Use of Renewable Energy Sources and Increasing Energy Efficiency
CEC5	Demonstration of energy efficiency and utilisation of renewable energy sources through public buildings	3sCE412P3	Priority 3	3.3 Supporting the Use of Renewable Energy Sources and Increasing Energy Efficiency
COBRA MAN	Manager Coordinating Brownfield Redevelopment Activities	1CE014P4	Priority 4	4.1 Developing Polycentric Settlement Structures and Territorial Cooperation
ReNewTown	New post-socialist city: Competitive and Attractive	3CE344P4	Priority 4	4.1 Developing Polycentric Settlement Structures and Territorial Cooperation
SECOND CHANCE	From Industrial Use to Creative Impulse	2CE177P4	Priority 4	4.3 Capitalising on Cultural Resources for More Attractive Cities and Regions

Source; MA/JS Interreg CE Programme

3.5.1. Proactive Innovation Support for SMEs in the Corridor from the Baltic to the Mediterranean Sea – PROINCOR

3.5.1.1. Aims of the project

PROINCOR is a CE 2007-2013 project that aimed at improving economic competitiveness in the geographical corridor from the Baltic to the Mediterranean Sea by strengthening innovation performance of SMEs and increasing the effectiveness of regional innovation systems. The project addressed enterprises with innovation needs in the main manufacturing and industrial service sectors of the regions and countries involved.

Led by Bautzen Innovation Centre, PROINCOR was run by 10 partners from 7 Central European countries (two from Germany, two from Poland, two from the Czech Republic, one from Austria, one from Slovenia and one from Hungary). The partners included development agencies, innovation centres, technological parks and a chamber of commerce. Total funding allocated to the project was more than EUR 3 million (80% from the ERDF, 15% from national co-financing and 5% from private co-financing).

The project started with diagnostic and advisory visits to SMEs with innovation needs. Simultaneously, an innovation audit methodology was developed with the cooperation of all the PROINCOR project partners. The partners provided training to innovation advisers on the use of the innovation audit methodology. An audit determined the strengths and weaknesses of internal innovation management at SMEs. Its purpose was threefold:

- To familiarise an enterprise with an accurate assessment of its current state of innovation practices and processes;
- To assess an enterprise's 'innovation curve', a measure of the company's strengths and weaknesses, to determine which areas are successful and which areas can be further improved by applying innovation processes; and
- To produce a set of measures and recommendations that enable enterprises to develop their own innovation path.

At the next stage, innovation advisers and company management jointly developed company-specific action plans to improve the companies' innovation performance. The partners also provided follow-up activities for the companies undertaking change in their innovation management systems and introducing innovative products/processes.

Additionally, in cooperation with public administrations, project partners developed recommendations on innovation policy, which were summarised in a policy paper 'Transnational recommendations on innovation policy'.

Project results were also disseminated during the final conference in Poznań, Poland, which was attended by representatives from local and national authorities, universities, innovation and technology centres. The final project presentation was published on the website www.proincor.eu and is available to the general public.

3.5.1.2. Output and results

One crucial output was the development of a common innovation audit methodology, which was implemented in all 10 partner regions of 7 CE countries. At the beginning of the project, a transnational training workshop was held in Graz for a transnational innovation adviser group, which was formed from members of all the project partners. After the transnational training workshop, 16 training events were conducted for regional innovation advisers. At these events, 30 innovation advisers were trained to use the methodology.

A newly developed innovation audit methodology was then used in 385 innovation audits of SMEs. It allowed PROINCOR to improve the innovation management system in about 200 companies. Management and/or employees in 109 persons were trained in innovation management topics, and 87 companies have improved their products and processes. More than EUR 32 million of private and public funds was leveraged as a result of the innovation audits conducted. Funding was used for investment in machinery and equipment, launching new products and processes, training in innovation management, and development of marketing concepts.

PROINCOR addressed the need for better coordination of regional innovation support activities. During implementation of the project, partner organisations and other actors from regional innovation systems cooperated intensively on many activities. In particular, the following collaborations between participants took place:

- Developing an innovation audit system;

- Cross-border project applications;
- Organisation of B2B meetings;
- Cluster collaboration with companies;
- Long-term collaboration in the field of interaction between science and economy, joint project work.

The PROINCOR business community that supports technology transfer and cooperation among SMEs in Central Europe is an additional result achieved during implementation of the project.

3.5.1.3. Impact of the project

Policy and governance impacts

PROINCOR has contributed significantly to promoting innovation and transfer of technology between the public R&D sector and SMEs in the CE along the Baltic–Adriatic Axis. In the framework of transnational cooperation, important synergies emerged between different stakeholders, such as district administrations, town administrations, national agencies for entrepreneurship and foreign investments, universities, colleges, chambers of commerce and industry, chambers of craft, innovation centres, regional economic development agencies and many companies.

Representatives from different levels of public administrations participated in the project meetings and conferences. They contributed to identifying preconditions for and obstacles to innovation in the region and to developing the transnational recommendations on innovations policy. A resulting policy paper 'Transnational recommendations on innovation policy' was distributed by the project partners via several communication channels to many administrations in the partner regions and at the national and EU level; it is expected to be used as a tool for policy makers.

The project has helped public administrations to understand better how to assure governance of innovation support and what tasks could be delegated to experienced innovation facilitators. PROINCOR has shown that a well-organised advisory service can minimise problems related to communication issues between government and business.

Sustainability

The innovation audit methodology developed in the course of the PROINCOR project was used after the end of the project for innovation audits in most of the partner regions. The policy recommendations developed were used by local governments and other stakeholders in the region in their innovation support programmes. For example, the Chamber of Commerce and Industry of Hajdú-Bihar County in Hungary provided financing for innovation support using the innovation audit methodology. Bautzen Innovation Centre used the innovation audit methodology in combination with regional and national programmes in the current funding period.

Part of the PROINCOR project partners continued cooperation with a large number of companies that were involved in the project. The companies are supported in their implementation of hands-on measures and follow-up activities developed by innovation advisers and company management. These

support activities are mostly focused on the projects funded from the structural EU funds. The Slovenian partner invited audited companies to join support programmes at the local and national level, as well as to join promotion activities organised by Technology Park Ljubljana, such as Researchers' Night in Klagenfurt.

After the end of the PROINCOR project, some partners stayed in close contact for further cooperation and future project applications. At some occasions new projects were approved. For example, cooperation between the former project lead partner Bautzen Innovation Centre and the Technology Park Ljubljana Ltd. (as well as new partners) led to the Interreg CE THINGS+ project, which focusses on transforming traditional companies into regional innovation motors). Some partners have concluded bilateral contracts that will be in force after the project's end. For instance, an Italian partner from Trieste signed soft-landing agreements with Technology Park Ljubljana, SVG Styria and the Business and Innovation Centre (BIC) in Frankfurt (Oder). Bautzen Innovation Centre from Germany continued to organise B2B meetings between Polish, Czech and German companies in close cooperation with the Polish and Czech partner organisations.

Benefits to stakeholders, target groups, general public

The main target groups of the PROINCOR project were SMEs from all sectors, but mainly from the manufacturing and industrial service sectors. As a result of the project, they could substantially improve their innovation performance by undertaking changes in their innovation management systems and introducing innovative products/processes.

In addition, representatives of regional and national innovation systems (private innovation advisers, state universities and research institutions) were involved in the project, along with public administrations (district administrations, town administrations, regional and national agencies for entrepreneurship and foreign investments). Such a broad range of target groups allowed more efficient communication between the stakeholders, whose goal it was to identify the main challenges and obstacles to innovation and develop relevant policy recommendations.

Although the process of innovation mainly occurs through local and regional-level interaction between enterprises and research institutions, the transnational collaboration facilitated by PROINCOR provided additional benefits, as it ensured a flow of information and knowledge between regions in Central Europe and better coordination of regional innovation support activities. PROINCOR's innovation adviser group links innovation support systems from all 10 regions cooperating in the project and provides access to high-level technologies and expertise.

The following interest groups were involved in PROINCOR: shareholders of the project partner organisations, private consultancies and industrial clusters. These interest groups were very important for public awareness and support of the project by the authorities. In addition, a few private consultancies were trained as regional innovation advisers and were involved in the project implementation.

3.5.1.4. Summary assessment of the project's impact and benefits

With a total budget of around EUR 3 million, PROINCOR fulfilled its aim and contributed to a strengthening of the innovation performance of SMEs and increasing effectiveness of regional innovation systems in Central Europe. An innovation audit methodology developed in the course of the project was used for innovation audits of 385 SMEs. More than EUR 32 million of private and public funds was leveraged for innovation activities as a result of the project. Additionally, close cooperation was established between representatives of regional and national innovation systems and public administrations, which allowed recommendations for innovation policies to be developed. Therefore, PROINCOR is considered a highly successful project.

3.5.1.5. The PROINCOR story

The aim: Strengthening the innovation performance of SMEs

PROINCOR is a network of 10 business incubators, technology agencies and business development agencies in seven countries (Germany, Poland, the Czech Republic, Austria, Slovenia and Hungary), which joined forces in order to support companies in their first steps towards a more innovative future. The main goal of the project, which ran in 2010-2013, was to improve the innovation performance of small and medium-sized enterprises in the geographical corridor from the Baltic to the Mediterranean Sea.

The challenge: Increasing the effectiveness of the regional innovation systems

Claiming over EUR 3 million (80% from the ERDF, 15% from national co-financing and 5% from private co-financing), PROINCOR focused on targeting enterprises' needs in relation to innovation on an individual basis. Project partners developed an innovation audit methodology and used it to assess the strengths and weaknesses of the internal innovation management of SMEs. Based on the audit results, innovation advisers and the management of enterprises jointly developed company-specific action plans to improve companies' innovation performance.

Additionally, project partners addressed the main issues in regional innovation policies that prevent efficient transfer of technologies between an R&D sector and business. Innovation policy recommendations were developed in cooperation with public administrations.

The results: SMEs benefit from innovation boost and important synergies emerge

Thanks to PROINCOR, 385 SMEs could benefit from innovation audits that enabled them to develop their own innovation path. In all, 200 companies have improved their innovation management systems and 87 have improved their products and processes. In the course of the project, more than EUR 32 million of private and public funds was leveraged as a result of the innovation audits conducted. Funding was used for investment in machinery and equipment, launching new products and processes, training in innovation management, and development of marketing concepts.

PROINCOR has contributed significantly to promoting innovation and the transfer of technology between the public R&D sector and SMEs. In the framework of transnational cooperation, important synergies

emerged between different stakeholders, such as district administrations, town administrations, national agencies for entrepreneurship and foreign investments, universities, colleges, chambers of commerce and industry, chambers of craft, innovation centres, regional economic development agencies and many companies.

The project has helped public administrations to understand better how to assure governance of innovation support and what tasks could be delegated to experienced innovation facilitators. PROINCOR has shown that a well-organised advisory service can minimise problems related to communication issues between government and business.

3.5.2. Introducing Innovation Inside SMEs – I3SME

3.5.2.1. Aims of the project

I3SME focussed on creating a prolific environment for innovation by enhancing the performance of micro enterprises and SMEs in research and innovation fields. The project focused on regions in Italy, Germany, Austria, Hungary, Poland and Slovenia, where economic production is characterised by a high concentration of small and medium enterprises.

I3SME was run by nine partners from six Central European countries (three from Italy, two from Hungary, and one each from Austria, Germany, Poland and Slovenia), under the lead of the Province of Bologna. The partners included public administrations, regional development agencies, business associations and a technological centre affiliated to a university. Total allocations to the project were more than EUR 2.3 million (78% from the ERDF, 17% from national co-financing and 5% from private co-financing).

The main focus of the project was on developing an online software platform for benchmarking analysis, in order to assess and improve the performance of SMEs and micro enterprises. Partners selected a set of indicators to measure the innovation levels of companies and compiled a questionnaire for evaluation of the indicators, to be administered by facilitators. Later on, each partner used the online platform to analyse the outcomes of the questionnaires completed by companies and to develop an individual report on innovation for each company participating in the project. The innovation reports contained an analysis of the innovation level of each company and the corresponding region. The online platform contains data on 852 companies (around 100 companies per country).

The data were collected by facilitators, who participated in five training sessions from July 2009 to June 2010 and undertook a study visit in October 2010. This training prepared facilitators to support SMEs in self-analysis, learning, creation and transfer of knowledge. They carried out an analysis of the innovation reports produced by the web platform and assisted companies in creating specific action plans/guidelines with the participation of relevant stakeholders.

A list of the most innovative companies (named ‘hidden champions’) was compiled. Hidden champions are unknown but highly successful companies that exemplify best practice, according to the benchmarking analysis. In order to disseminate the best practices, these companies were included in a Hidden Champions catalogue – a publication containing a description of the analysis methodology and brief profiles of the companies.

After the benchmarking analysis revealed weaknesses in companies, partners decided on topics for pilot actions, which were intended to be a test of the new services’ effectiveness at the regional level. In total, 13 pilot actions were implemented: three in Bologna, one in Trento, three in Austria, one in Germany, one in Poland, one in Hungary and three in Slovenia. Each partner organised training activities and workshops for companies aimed at the transfer of know-how on innovation, for example via links with research centres and universities, innovative financing system application, assistance of local stakeholders, etc.

A strategic committee was set up jointly with representatives of public administrations and local stakeholders, in order to develop policy recommendations and new innovation promotion programmes in the area concerned.

Finally, a number of public events was organised in Italy, Austria, Slovenia and Hungary. The events included several international conferences and research 'cocktails'.

3.5.2.2. Output and results

The project's work resulted in a large number of outputs. One crucial output was the development of an online software platform for benchmarking analysis, which is used for assessing and improving the innovation performance of SMEs and micro enterprises. The platform was used for collecting data on the performance of 852 SMEs and micro enterprises.

Some 22 facilitators were trained in the course of five training sessions and one study visit. Training focused on topics of innovation application, benchmarking methodologies, support for companies and the launch of pilot projects. A transnational network of facilitators was formed to support companies in the development and realisation of their innovation plans.

Thirteen pilot actions were carried out during the course of I3SME: three in Bologna, one in Trento, three in Austria, one in Germany, one in Poland, one in Hungary and three in Slovenia.

Owing to public funds available for companies EUR 17 million of private funding was leveraged. Funding was used for investment in new plants, machinery and equipment, the launch of new products and processes, and the upgrading of human resources. It is estimated that 284 jobs were created as a result of this investment.

In all, 64 highly successful companies – termed 'hidden champions' – were identified (eight by each partner). A catalogue describing all the hidden champions was published both online and as a hard copy in order to disseminate the best practices identified. This tool supported the creation of an international network of SMEs interested in sharing experiences and business opportunities.

3.5.2.3. Impact of the project

Policy and governance impacts

The I3SME project contributed to improving innovation policies and cooperation between the public sector and SMEs in the CE. Events organised and dissemination activities allowed for the creation of new links between local stakeholders, research centres, universities, technology transfer offices, etc.

A consultative committee was created to familiarise decision makers with the results of the project and to provide them with inputs and suggestions for innovation policies. 'Research cocktails' were another opportunity to present the project's results and to share the participants' perspective.

The project provided insights into the stimulation of innovation policy improvements at the regional level, in particular through creating links with the research sector, credit facilitation for SMEs, supporting internationalisation and business matching of productive enterprises, and the development of clusters at the regional level.

Sustainability

The online software platform for benchmarking analysis developed in the course of the I3SME project continued to be used for benchmarking analysis of SMEs after the end of the project. In some countries, entities supporting links between SMEs, universities and public administrations were created, as for example Technopoles in the Emilia Romagna region.

The decision makers involved in the consultative committee were informed of the project's results and received all the inputs from the partners in order to define innovative policies and programmes. Transfer of results into policy at the local and regional level was expected to continue after the project's end.

After the end of the I3SME project, all the partners intended to stay in close contact for further cooperation and future project applications. Some of the partners were already working on similar topics, in particular in the following projects:

- C-PLUS (CE Project): creation of a regional cluster using the online benchmarking analysis platform developed during the I3SME project;
- ACCESS (CE Project): peer reviews conducted by experts in different sectors (food, mechatronics and biotech) and involving a number of companies and local stakeholders;
- FORT (CE Project): supporting links between universities and the private sector, in particular during an innovation forum and open-house events (where the Hidden Champions catalogue and other I3SME information materials are distributed);
- CLUSTER CORD (CE Project): supporting the internationalisation of clusters through collaboration at an international level within a SMEs network;
- CLOUD (Southeast Europe Programme): supporting application of innovative ICT systems by SMEs.

In some of these projects (C-PLUS, ACCESS and CLOUD) the benchmarking analysis platform developed in the I3SME project was successfully used.[326]

Benefits to stakeholders, target groups, general public

The main target groups of the I3SME project were SMEs. As a result of the project, they could understand their needs in innovation, learn from the best practices of hidden champions, and obtain funding for investing in innovative technological solutions and undertaking changes in their innovation management.

Representatives from different levels of public administrations and local stakeholders participated in the consultative committee and public events organised by the participants. Information they received was useful for developing innovation policies.

[326] Interview Giovanna Trombetti, Area sviluppo economico, Citta' metropolitana di Bologna.

Also, partly due to the project it was possible for some SMEs to access other funds, mainly the ERDF, to invest into improving their level of innovation and modernising their equipment and management models. [327]

3.5.2.4. Summary assessment of the project's impact and benefits

With a budget of around EUR 2.3 million, I3SME fulfilled its aim and contributed to strengthening the innovation performance of SMEs in Central Europe. An online software platform for benchmarking analysis developed in the course of the project was used to assess and improve the performance of 852 SMEs and micro enterprises. Around EUR 17 million of private funds were leveraged for innovation activities as a result of the project. In addition, the project brought about close cooperation between partners who are continuing their joint work in other projects promoting innovation. Therefore, I3SME is considered a highly successful project.

3.5.2.5. The I3SME story

The aim: Strengthening innovation performance of SMEs

In 2008, nine partners from different regions of Central Europe launched the I3SME project with the intention of enhancing the innovation performance of micro enterprises and SMEs. The project ran for three years and focused on regions of Italy, Germany, Austria, Hungary, Poland and Slovenia where economic production is characterised by a high concentration of small and medium-sized enterprises.

The challenge: Benchmarking analysis and identifying needs in innovation

With the total allocations to the project amounting to EUR 2.3 million (78% from the ERDF, 17% from national co-financing and 5% from private co-financing), I3SME focused on developing an online software platform for benchmarking analysis, in order to assess and improve the innovation performance of SMEs and micro enterprises. Based on the results of the analysis, innovation facilitators helped enterprises to develop company-specific action plans in order to achieve higher levels of innovativeness.

The results: SMEs benefit from improving their innovation performance

The online platform was used for collecting data on the performance of 852 SMEs and micro enterprises. The benchmarking analysis of the data allowed facilitators to assist companies in creating specific action plans/guidelines. Furthermore, the analysis helped partners decide on topics for pilot actions, which were intended to be a test of the new services' effectiveness at the regional level. In total, 13 pilot actions were implemented: three in Bologna, one in Trento, three in Austria, one in Germany, one in Poland, one in Hungary and three in Slovenia.

Owing to public funds available for companies (mainly through Structural Funds based of the Regional Operative Programmes), EUR 17 million of private funds was leveraged. Funding was used for investment in new plants, machinery and equipment, to launch new products and processes, and to upgrade human resources. It is estimated that 284 jobs were created as a result of this investment.

[327] Interview Giovanna Trombetti.

In all, 64 highly successful companies – termed 'hidden champions' – were identified (eight by each partner). A catalogue describing all the hidden champions was published both online and as a hard copy, in order to disseminate the best practices identified. This tool supported the creation of an international network of SMEs interested in sharing experiences and business opportunities. Also, partly due to the project "*it was possible for some SMEs to access other funds, mainly the ERDF, to invest into improving their level of innovation and modernising their equipment and management models"* (Giovanna Trombetti, Area sviluppo economico, Citta' metropolitana di Bologna)

3.5.3. SMART Training Network for Innovation and Entrepreneurship in Emerging Sustainable Economic Sectors – i.e.SMART

3.5.3.1. Aims of the project

i.e.SMART was a CE 2007-2013 project that aimed at enhancing the skills, employability and entrepreneurship of young people via the creation of new companies in research-intensive sectors. As such, this initiative contributed to three out of the seven flagship initiatives of the EUROPE 2020 Smart Growth Agenda: Education, Innovation and Digitalisation.

The transnational cooperation, led by the Vienna Board of Education, involved 12 partners – two from each of six CE countries (Austria, Czech Republic, Germany, Italy, Hungary and Slovakia) as well as one institutional and one expert partner. The consortium developed the project idea in consultation with the relevant associated institutions and regional stakeholders and shareholders, such as regional labour directorates, municipalities, enterprise agencies, and universities, educational and training institutions.

The total funding allocated to implementation of the project idea amounted to EUR 2.1 million (78.1% from ERDF, 21.2% from public co-financing and 0.67% from private co-financing). For boosting youth entrepreneurship in emerging economic sectors, such as the green economy and ICT, the workload was organised in six working packages (WPs). The first two mainly dealt with project management, coordination, communication, knowledge management and dissemination. The thematic work packages WP3 to WP6 had the task of analysing the specific regional needs and areas of weakness and fostering the areas of strength – first as concerns the enhancement of human capital, education and training and the adaptability of workers, and secondly as concerns mobilising the growth potential of the respective regions.

In particular, WP3 constructed and developed the basis for establishing regional centres of competence for innovation and entrepreneurship (i.e.SMART points), which offered training, mentoring and counselling for entrepreneurs in the emerging sustainable economic sectors of creative industries, the green economy and ICT. The transnational i.e.SMART network was established to support the i.e.SMART points. This network contributed to increasing the synergy and the strategic cooperation between the project partners' regional i.e.SMART points.

WP4 consisted in planning, developing and evaluating transnational i.e.SMART training programmes. It developed a concept and action plan to train the SMART trainers working at the i.e.SMART points. In similar vein, an i.e.SMART campus strategy and action plan was developed. In support of such programmes a transnational knowledge management tool – the i.e.SMART site – was developed. This tool offered relevant information, working material and research about the 'right-brain approach'[328] to innovation and entrepreneurship.

WP5 brought forward the project idea by implementing the transnational Train the i.e.SMART Point Trainers programme and i.e.SMART campus. The task of WP5 was to train entrepreneurs according to the 'right-brain approach'. Finally, WP6 institutionalised the i.e.SMART joint transnational strategy and

[328] i.e.SMART adopts 'a more holistic approach' and emphasises the 'social aspects' of innovation and entrepreneurship by promoting right-brained skills like creativity, inventiveness, empathy and big-picture thinking, coupled with awareness of corporate social responsibility, communal benefits and ecologically aware businesses. Source: AF, p. 14.

action plans by putting emphasis on the sustainability and added value of the i.e.SMART concept and approach after the project's lifetime – a milestone that was ensured by a memorandum of agreement signed by all partners.

3.5.3.2. Output and results

The project's work resulted in a large number of outputs. These include three joint transnational strategy and action plans; establishment of two joint managements and the development of three transnational tools. The project contributed to bring together and enhance the synergy between training methods and business ideas at the transnational level. The i.e.SMART Network – a transnational management structure – not only connects all the regional i.e.SMART points, but contributes to spreading and sharing experiences and best practice throughout the project area. An important contribution has been the implementation and integration of a right-brain innovation and entrepreneurship approach into regional/national development action plans, which contribute further to the strategies related to demographic change, migration and brain drain in the project partners' regions. Most importantly, the continuation and sustainability of the project have been assured, with the i.e.SMART concept having been incorporated into regional/national development plans. The project partners' regions are committed to continuing to run the i.e.SMART sites, supported by regional or national funding.

In more detail, the outputs are:

The joint transnational strategy and action plans, which are:

1. The core output Train the i.e.SMART Trainers Strategy and Action Plan, which followed a 'snowball approach' in generating and transmitting training from i.e.SMART trainers to other trainers in the i.e.SMART points, and so on;
2. The Train the i.e.SMART Campus Strategy and Action Plan, via which the emerging entrepreneurs had the opportunity to receive mentoring from i.e.SMART trainers in how to improve, present and get their project ideas funded;
3. The i.e.SMART plan, which was compiled in consultation with international experts, investors, EC representatives and stakeholder/shareholder groups and used to facilitate negotiations with regional/national authorities.

The transnational tools developed and implemented:

1. The development and implementation of the ICMS i.e.SMART Site (http://smart.dke.univie.ac.at) which presents the project and offers relevant information about innovative and creative approaches to entrepreneurship development;
2. The Final Train the i.e.SMART Trainers action, which consisted of trainers – after their own training – training other trainers;
3. The i.e.SMART Campus Training tool, which facilitated and offered training to 45 emerging entrepreneurs in multi-disciplinary innovation and entrepreneurship in the emerging sustainable economic sectors. Several of them are in negotiations to become new enterprises.[329]

[329] Interview Stuart Simpson, European Office, Vienna Board of Education

The joint management establishments:

- The permanent i.e.SMART points, which consist of nine regional centres of competence, offering mentoring to young emerging entrepreneurs who aim to mature or develop a business idea/plan (in three emerging sustainable economic sectors creative industries, green economy and ICT), with the support of i.e.SMART trainers. Such centres offer fully fledged services and are funded by the hosting institutions;
- The i.e.SMART Network, which has been developed, implemented and institutionalised by a memorandum of agreement signed by all partners involved.

3.5.3.3. Impact of the project

Policy and governance impacts

The consortium formed in the framework of SMART brought together quite a number of regions, which diverged in experience, size and capability, but at the same time shared a common goal: tackling innovation and entrepreneurship challenges at the transnational level. Such a goal involved and brought around the table a number of entities, such as regional government planning bodies and regional development agencies dealing with strategic planning for entrepreneurship and innovation; stakeholders and shareholders in particular labour market entities, such as chambers of commerce, chambers of labour, regional labour offices, who place their main focus on business start-ups; and also education/training entities, whose main focus is the education and training of young entrepreneurs.

i.e.SMART offered great support to regional policy by bringing forward the Lisbon and Gothenburg agendas and Europe 2020 strategy goals, especially as concerns cohesion policy. Furthermore, the project was able to put into action the priorities of the Innovation Union. The project's implementation in seven partner regions was able to generate innovative products, services and business models which serve to underpin transregional strategic planning to boost entrepreneurship in the emerging sustainable economic sectors.

Sustainability

The three joint transnational strategy and action plans and joint management establishments developed by i.e.SMART have been successful in addressing and implementing regional cohesion policy and the renewed Lisbon and Gothenburg agendas about Working Together for Growth and Jobs. Such establishments not only ensure a continuation of the cooperation at the project level, but also reinforce the cooperation among stakeholders and target groups in the future. Via the memorandum of agreement for the sustainability of project outputs and cooperation, all 12 partners committed themselves to continue to cooperate and work together in the future.

This led to the continuation of the transnational SMART Network interlinking SMART points in seven central European regions. One outcome of this continued cooperation is the Interreg CE CERIecon project that aims to provide, at regional level, the right mix of financial and non-financial support to assist entrepreneurs to create new firms. Hence CERIecon contributes to a change in the way entrepreneurs are trained and supported through a balanced package of strategies, actions plans, pilot actions,

training, and tools to create new-type comprehensive regional innovation ecosystems in seven Central Europe regions (i.e. the SMART points regions).

Remarkably, the i.e.SMART project also led to the introduction of a Master of Art programme in Stuttgart. The Stuttgart Media University developed together with the main Stuttgart University a Master of Arts study programme for entrepreneurship. The programme has been approved by the State authorities and is the first of its kind in Germany. [330]

Benefits to stakeholders, target groups, general public

More than 4,272 entities were actively involved in the project. The consortium formed in the framework of i.e.SMART was supported by an extensive network of 30 associated institutions. Among them, policy-making entities (e.g. regional government planning bodies) benefited from a strengthening of human resources and knowledge development. Also educational and training institutions benefited from the improved framework for knowledge development.

A number of institutions and companies benefited from the actions aimed at strengthening the diffusion of technological and innovation results, especially as concerns the three emerging sustainable economic sectors of creative industries, the green economy and ICT.

Labour market entities that place special emphasis on business start-ups, employment, entrepreneurship and innovation – which often lack the transnational perspective – could abandon the approach of thinking locally. Instead, new ideas and new solutions embrace a transnational approach. Accordingly, the consortium helped labour market entities to operate in a better transnational climate to boost entrepreneurship, innovation, youth employability and business start-up survival.

The main success according to Stuart Simpson (representative of the former lead partner, European Office, Vienna Board of Education) was the development of a new methodology to train young entrepreneurs called the ‘The Transformative Business Approach’. It focuses on the need for empathy and creativity in business idea generation.

Using this new methodology, training was provided to over 600 young entrepreneurs from seven Central European regions between the ages of 14 and 30 to invent new ideas for three resilient economic sectors: creative industries, green economy and ICT. Many of these ideas were then further pursued into serious business plans.

Furthermore, i.e.Smart educated 50 internationally purpose-trained SMART Trainers, who in turn trained 185 further SMART Trainers in their Member States in a ‘snowball effect’. Added to this, the SMART Point Vienna developed a specialized Entrepreneurial Curriculum for in-service teacher training. As a result, 24 training workshops have been implemented reaching out to 130 teachers. Also the SMART Point Vienna, in cooperation with the University College of Teacher Education Vienna/Krems, has been actively reaching out to secondary schools teachers and pupils across the city. The SMART Point offers a monthly SMART Brunch with successful, inspirational, young entrepreneurs from the Viennese community as role models who tell their success stories to school pupils. Nearly 700 pupils and 160 teachers in Vienna have been reached and inspired through the Brunches.

[330] Interview Stuart Simpson.

"*Thanks to the project's transnational efforts to develop young entrepreneurs across central Europe, educational systems have begun to look at how entrepreneurial thinking is interdisciplinary and can be imbedded in mainstream instruction.*"(Stuart Simpson, European Office, Vienna Board of Education)

3.5.3.4. Summary

With a total funding of EUR 2.1 million and 12 partners from CE, i.e.SMART built a network that promoted entrepreneurship among youth, especially in emerging sectors of the economy such as the green economy and ICT. The project set up i.e.SMART points that offer fully fledged services, exchange of training, experience and ideas at the transnational level. Additionally they were the starting point for a new Interreg CE project CERIecon.

i.e.SMART reached 4,272 entities, far more than expected, trained over 600 young entrepreneurs from seven Central European regions, educated 50 internationally purpose-trained SMART trainers, who in turn trained 185 further i.e.SMART trainers and organised 24 training workshops reaching out to 130 teachers. With that the i.e.SMART project generated a paradigm shift by overcoming thinking in terms of national/regional competitiveness in order to strive for a more competitive and innovative Central Europe area as a whole.

3.5.3.5. i.e.SMART story

The aim: Boosting youth entrepreneurship in innovation

In 2012, the Vienna Board of Education built a consortium with other partners from CE – the Czech Republic, Germany, Italy, Hungary and Slovakia – with the aim of building a network that would boost entrepreneurship among youth, especially in emerging sectors of the economy such as the green economy and ICT. The network aimed at mobilising the growth potential of the respective regions following a transnational approach that involved a number of regional stakeholders and shareholders, employment and enterprise agencies, universities, educational and training institutions.

The challenge: Tackling innovation and entrepreneurship at a transnational level

The total funding of EUR 2.1 million (78.1% from ERDF, 21.2% from public co-financing and 0.67% from private co-financing) contributed to the setting-up of nine permanent i.e.SMART points. The i.e.SMART points offer fully fledged services, exchange of training, experience and ideas at the transnational level. The i.e.SMART concept emphasises the 'social aspects' of innovation and entrepreneurship by promoting the 'right-brain approach'. Thanks to i.e.SMART, this concept has been incorporated into regional and national development plans. Furthermore, the i.e.SMART project contributed a number of tools to support and mentor young entrepreneurs in how to develop project ideas and how to get their projects funded, especially for those projects which fall into the categories of the green economy and ICT.

The results: "*We established a new culture of entrepreneurship education, new teaching methods and a tighter network of the stakeholders.*" (Hartmut Rösch, Stuttgart Media University)

A number of EU countries have been struggling with high levels of youth unemployment and low capacities in creating new companies, especially in emerging sectors of innovation.

In such a context, the i.e.SMART project generated a paradigm shift by overcoming thinking in terms of national/regional competitiveness in order to strive for a more competitive and innovative Central Europe area as a whole.

The i.e.SMART Network managed to connect all the regions involved. i.e.SMART points contributed to a strengthening of human resources, knowledge development and the sharing of ideas and experience.

In boosting youth entrepreneurship in emerging economic sectors, such as creative industries, the green economy and ICT, the workload was challenging, but the outcome was a big success story for the project. The target group reached by the project exceeded 4,272 entities, a figure far higher than was initially planned.

i.e.SMART trained over 600 young entrepreneurs from seven Central European regions between the ages of 14 and 30 to invent new ideas for creative industries, green economy and ICT. Many of these ideas were then further pursued into serious business plans. Furthermore, i.e.Smart educated 50 internationally purpose-trained SMART trainers, who in turn trained 185 further i.e.SMART trainers in their Member States in a ‘snowball effect’. Added to this, the SMART Point Vienna developed a specialized Entrepreneurial Curriculum for in-service teacher training. As a result, 24 training workshops have been implemented reaching out to 130 teachers.

The sustainability of the project over time is another great achievement, reached through the memorandum of agreement signed by all 12 partners involved which directly led to the Interreg CE project CERIecon that aims to provide, at regional level, the right mix of financial and non-financial support to assist entrepreneurs to create new firms.

Finally, through its work, i.e.SMART contributed to the priorities of the Innovation Union and managed to generate a number of tools in support of regions involved in improving the climate for innovation, assisting them in taking full advantage of their innovation potential, addressing their specific needs and areas of weaknesses. At the same time, the project successfully addressed and implemented the regional cohesion policy and the renewed Lisbon and Gothenburg agendas Working Together for Growth and Jobs.

3.5.4. Baltic–Adriatic Transport Cooperation – BATCo

3.5.4.1. Aims of the project

BATCo supported the inclusion of the Baltic–Adriatic Axis in the TEN-T Core Network by providing technical and scientific analysis-based policy recommendations to regional, national and European decision makers. With this, BATCo intended to show that a well-developed Baltic–Adriatic Axis contributes strongly to achieving European Union strategic goals (e.g. Europe 2020).

Led by the regional government of Carinthia (Austria), BATCo included 19 partners from 5 CE countries (seven Italian, five Austrian, five Polish partners and one partner each from the Czech Republic and Slovakia) that represented the main stakeholders of the Baltic–Adriatic Axis, such as transport experts, development agencies, chambers of commerce, regional governments, ministries and port authorities.

Based on total project allocations of more than EUR 3.3 million (78% from the ERDF, 21% from national co-financing and 1% from private co-financing), BATCo was organised in five work packages (WPs). While WP1 and WP2 covered administrative, legal and financial issues, as well as communication and dissemination of the project results, WP3 to WP5 involved three thematic pillars that analysed the main technical, environmental and economic aspects of the Baltic–Adriatic Axis.

WP3 focused on the transport system along the Baltic–Adriatic Axis and developed and implemented technical planning tools, including a harmonised up-to-date transport database that contained an axis-wide transport model, the identification of green transport potentials and a green transport decision-support model.

WP4 focused on the transport-related impacts on the environment. It analysed the potential to reduce negative effects on the environment caused by passenger and freight transport along the Baltic–Adriatic Axis, including the costs of air and noise pollution and road safety. The work in this WP included developing an axis-wide transport impact model, identifying environmental protection and safety potentials through a decision-support model.

WP5 aimed at stimulating and developing economic activities along the Baltic–Adriatic Axis by supporting end users, such a logistical centres and SMEs. Through WP5, BATCo strengthened intermodal logistics solutions and developed business models to support their use by SMEs. It also created transnational business cooperation nodes that supported local organisations in business networking across the larger corridor's geographical area.

3.5.4.2. Output and results

The project's work resulted in a large number of outputs. They included two action plans, one implemented strategy, five new tools developed (two of which were also implemented), one permanent cooperation and five pilot actions. The project also contributed to an improved and more sustainable interconnectivity at urban, regional and transnational level via a memorandum of understanding and implementation of the Action Plan for Institutional Cooperation in the 18 BATCo project partners. BATCo also led to better solutions for multimodal logistics via the implementation of the Action Plan for

Transnational Business Cooperation Alliance in all eight BATCo countries and the inclusion of 250 institutions in logistical cooperation undertakings. In the course of the project, 24 persons received training.

Most importantly, BATCo significantly contributed to the inclusion of the Baltic–Adriatic Axis in the TEN-T Core Network (now Baltic–Adriatic Corridor), which was the core aim of the project. Through this, BATCo helped secure approx. EUR 26 billion for infrastructure investment in the Baltic–Adriatic Corridor for the period 2014-2020.

In more detail the outputs are:

Action plans:

a) Action Plan for Institutional Cooperation: It strengthened the project partners' cooperation and individual actions to communicate the project's results to the European authorities in charge of the TEN-T Guidelines and the Connecting Europe Facility approval process.
b) Action Plan for Transnational Business Cooperation Alliance: It led to the creation of a Network of Transnational Business Cooperation Points (TCP) assisting local organisations and enterprises to expand their business activities along the Baltic–Adriatic Axis.

Implemented strategy:

a) Transnational Business Cooperation Alliance: Eight project partners took over the role of a TCP to support business cooperation in the regions along the axis. During the project's lifetime these TCPs handled requests from a number of Austrian and Czech companies, e.g. Europlast Kunststoffbehälterindustrie GmbH (Austria), Schwing GmbH St. Stefan (Austria), OSMA TrockNERsysteme GmbH (Austria), SATJAM, s.r.o. (Czech Republic) and Erel Group (Austria).

Tools developed:

a) BATCo Transport Model – TRANS-TOOLS: This provided the basis for almost all further activities in WP3 to WP5. TRANS-TOOLS is a European transport network model that allows the cost, capacity and the effects of externalities to be estimated for transport on the Baltic–Adriatic Axis corridor under different scenarios. The model covers road, rail and air transport, as well as inland waterways for both passenger and freight transport for the whole European area.
b) BATCo Transport Impact Model: This allows traffic-related impacts on the environment to be estimated in terms of air and noise pollution and road safety.
c) Decision Support Model Green Transport and the Decision Support Model Green Transport – Impacts on Environment: Their output allows decision makers to quantify the environmental and economic impacts of transport infrastructure decisions, thus providing a basis for strategic, evidence-based planning.
d) Cooperation Model for Logistics Centres: This supported the work of transnational logistics centre incubators, by exchanging best practice, experience and knowledge.
e) BATCo Information Pools (BATCo InfoPools): These stored the information collected by the projects via stakeholder surveys and interviews (including with logistics centres, chambers of commerce, regional governments, development agencies) and made it publicly available.

Permanent cooperation: Cooperation agreement between the region of Carinthia (Austria) and the North-Adriatic Ports Association (NAPA), which is the basis for the joint development of strategies and policies (e.g. dealing with new train connections between Carinthia and the Port of Venice) and the exchange of knowledge.

Pilot actions: The BATCo Transport Model has been used to estimate the green transport potentials and to forecast transport volumes for road and railway, considering both passenger and freight transport for five important local areas along the Baltic–Adriatic Axis; these areas are major cross-sections and include Udine/Palmanova, Wörthersee, Koralm/Pack, Semmering/Wechsel, and the border region Czech Republic/Poland.

3.5.4.3. Impact of the project

Policy and governance impacts

BATCo contributed significantly to the European decision-making process by providing facts and positive arguments that supported the inclusion of the Baltic–Adriatic Axis in the TEN-T Core Network and the approval of both the TEN-T Guidelines and the Connecting Europe Facility. Furthermore, through its partner structure BATCo also helped to include the Baltic–Adriatic Axis in several national and regional transport master plans in the partner countries.

BATCo, in supporting the Baltic–Adriatic Axis provided valuable arguments to justify large-scale railway infrastructure either already under construction (such as the Semmering-Base Tunnel and the Koralm Railway, including the Koralm Tunnel) or at the planning stage, such as the new offshore terminal at the Port of Venice. In addition, BATCo demonstrated that investments to improve cross-border sections of railway lines are necessary to ensure successful implementation of the TEN-T Core Network up to 2030. BATCo's recommendations were confirmed by EU decisions to provide significant amount of Connecting Europe Facility funds to eliminate cross-border bottlenecks.

Furthermore, BATCo's definition and identification of bottlenecks was one basis for the applications of Austria, the Czech Republic and the Slovak Republic, as well as the regions of Friuli-Venezia Giulia (Italy), Carinthia (Austria), Styria (Austria), the Moravian-Silesian Region (Czech Republic) and the Pomeranian Region (Poland) for TEN-T funding for infrastructure projects.

Based on BATCo results and recommendations several policy documents, such as the Austrian transport master plan and the regional transport master plans in Carinthia and Styria, as well as in the Moravian-Silesian Region and Friuli-Venezia Giulia have been updated. Eight partner institutions from Austria, the Czech Republic, Italy, Poland and Slovakia acted as transnational cooperation points to support business cooperation up to the end of 2015 at their own expense.

On the governance side, the BATCo transport model data have been included in national transport models by ministries in Austria, the Czech Republic and Slovakia, and in regional transport models in Emilia-Romagna (Italy), Veneto (Italy), Friuli-Venezia- Giulia (Italy), Carinthia (Austria), Styria (Austria), Burgenland (Austria), Moravian-Silesian Region (Czech Republic), Silesia (Poland) and the Pomeranian Region (Poland).

Finally, BATCo was the basis for large-scale follow-up operations along the Baltic–Adriatic Axis in terms of upgrading the transport infrastructure (co-financed by the Connecting Europe Facility), but also in terms of further promotion of the modal shift from road to rail transport, as well as economic considerations in order to increase regional added value.

Sustainability

The project's main success – i.e. in contributing to the inclusion of the Baltic–Adriatic Axis in the TEN-T Core Network – is also its main guarantee of its long-run sustainability; not only because full implementation of the TEN-T Core Network is planned by 2030, but also because of the positive effects the newly created transport infrastructure will have on the economies of the partner countries and regions.

Furthermore, the governments of Carinthia and Friuli-Venezia Giulia agreed to continue cooperation on the basis of BATCo, including the development of a common transport strategy covering both railway passenger and freight transport. Based on BATCo results, Styria and Carinthia have started to develop projects for the elimination of existing and future bottlenecks on the Baltic–Adriatic Corridor. Also, several BATCo results and recommendations have been included in national and regional policy documents and transport models, as was shown in the policy impact section above.

BATCo was also essential for the implementation of a "dry port", i.e. an inland intermodal terminal directly connected by road or rail to a seaport, in the Austrian Villach/Fürnitz area. Furthermore BATCo models help to evaluate current transnational policy questions like the effects of a motorway toll in the context of the EUSALP strategy. Additionally, BATCo resulted in the development of the Austrian-Italian Cross border cooperation programme SMARTLOGi that aims to improve the operational and institutional cooperation regarding sustainable multimodal transport options.[331]

Benefits to stakeholders, target groups, general public

The main beneficiaries of the inclusion of the Baltic–Adriatic Axis in the TEN-T Core Network is the general public, who benefit from increased accessibility and improved rail transport services. Economically, the BATCo project results strengthen enterprises that produce or have a requirement for railway-affine goods, as well as the logistics sector for freight transport in general.

Overall, BATCo involved many different stakeholders from both the public and the private sector. The stakeholders and target groups can be divided into two major groups:

- Target groups contributing to the elaboration of BATCo outputs, such as public administrations (regional and national), railway operators (Trenitalia, OEBB and Balticrail, etc.), port authorities (e.g. North-Adriatic Ports Association, Port of Gdansk, Port of Gdynia and Port of Vienna), economic chambers, industrialists' associations, logistics service providers, enterprises operating with railway-affine goods, as well as different interest groups.
- Target groups supporting BATCo in disseminating results to the decision-making levels, like public administrations (regional, national and European), representation offices of the regions in Brussels, economic chambers, associations of municipalities and cities, etc.

[331] Interview Jörg Putzl, Regional Government of Carinthia - Department for Economic Law and Infrastructure

The involvement of and cooperation with these target groups ensures that the regional business sector, manufacturers and the population along the Baltic–Adriatic Axis benefit from BATCo achievements in a mid- to long-term perspective, thanks to improved solutions and services for both freight and passenger transport.

Some concrete examples of benefits have been discussed above (e.g. incorporation of project results in national and regional strategies). Other benefit examples (e.g. in the business sector) are the economic gains generated by the transnational cooperation points and the development of logistics centres for the firms along the Baltic–Adriatic Axis.

Finally, the project's results are also assumed to have positive effects on the environment, as the BATCo environmental modelling results influenced policy planning and making in a large number of BATCo regions, such as Emilia-Romagna, Veneto, Friuli-Venezia Giulia (Italy); Carinthia, Styria, Burgenland, Lower Austria (Austria); Zlín Region, Moravian-Silesian Region (Czech Republic); and Slaskie, Lodzkie, Wielkopolska and Pomeranian Region (Poland).

3.5.4.4. Summary assessment of the project's impact and benefits

With a total budget of around EUR 3.3 million, BATCo fulfilled its aim and contributed to the inclusion of the Baltic–Adriatic corridor in the TEN-T Core Network, thereby securing approx. EUR 26 billion for infrastructure investment in the corridor in the period 2014-2020. Additionally, it was included in several national and regional transport master plans and provided valuable arguments and tools for transport policy planning and making. Therefore, BATCo is considered a highly successful project.

3.5.4.5. The BATCo story

The aim: Getting the Baltic-Adriatic axis into the TEN-T Core Network

In 2006, the Austrian, Czech, Italian, Polish and Slovak transport ministers agreed to jointly develop the Baltic–Adriatic transport corridor. Within this framework, BATCo was set up as a TNC project to support the inclusion of the corridor in the TEN-T Core Network, by providing technical and scientific analysis-based policy recommendations to regional, national and European decision makers. Led by the regional government of Carinthia (Austria), BATCo brought together 19 partners from Austria, the Czech Republic, Italy, Poland and Slovakia, including transport experts, development agencies, chambers of commerce, regional governments, ministries and port authorities.

The challenge: Proving the importance of the Baltic–Adriatic Axis through evidence and actions

Claiming a total support of more than EUR 3.3 million (78% from the ERDF, 21% from national co-financing and 1% from private co-financing), BATCo focused on providing a reliable evidence base for policy makers. Creating an up-to-date transport database and state-of-the-art transport models, BATCo generated novel empirical evidence on the cost and capacity effects, as well as on the environmental externalities that the Baltic–Adriatic Axis would generate. The creation of a network of transnational business cooperation points and of logistics centre incubators demonstrated the potential economic gains from the Baltic–Adriatic Axis.

The results: A lot of small successes and one big one

BATCO evidence provided valuable arguments to justify large-scale railway infrastructure either already under construction (such as the Semmering-Base Tunnel or the Koralm Railway, including the Koralm Tunnel) or at the planning stage (such as the new offshore terminal at the Port of Venice).

Based on BATCo results, several policy documents (such as the Austrian transport master plan and the regional transport master plans for Carinthia and Styria, as well as those for the Moravian-Silesian Region and Friuli-Venezia Giulia) have been updated.

On the governance side, the BATCo transport model data have been included in national transport models in Austria, the Czech Republic and Slovakia, and in regional transport models in Emilia-Romagna, Veneto, Friuli-Venezia Giulia, Carinthia, Styria, Burgenland, Moravian-Silesian Region, Silesia and the Pomeranian Region.

Most importantly, through its work BATCo contributed to the European decision-making process supporting the inclusion of the Baltic–Adriatic Axis in the TEN-T Core Network. This found its successful conclusion on 19 November 2013, when the European Parliament approved the TEN-T guidelines as well as the Connecting Europe Facility, which included the Baltic–Adriatic transport corridor. By this, the five countries participating in BATCo gained access to EUR 29.3 billion to upgrade and implement transport infrastructure between 2014 and 2020.

In the aftermath, BATCo's definition and identification of bottlenecks was one basis for the applications of Austria, the Czech Republic and the Slovak Republic, as well as the regions of Friuli-Venezia Giulia, Carinthia, Styria, the Moravian-Silesian Region and the Pomeranian Region for TEN-T funding for infrastructure projects.

BATCo was also essential for the implementation of a "dry port", i.e. an inland intermodal terminal directly connected by road or rail to a seaport, in the Austrian Villach/Fürnitz area. Furthermore BATCo models help to evaluate current transnational policy questions like the effects of a motorway toll in the context of the EUSALP strategy. Additionally, BATCo resulted in the development of the Austrian-Italian Cross border cooperation programme SMARTLOGi that aims to improve the operational and institutional cooperation regarding sustainable multi-modal transport options.

Finally, BATCo was the basis for large-scale follow-up operations along the Baltic–Adriatic Axis in terms of upgrading transport infrastructure, but also in terms of further promotion of the modal shift from road to rail transport, as well as economic considerations in order to increase regional added-value.

"*Overall, BATCo showed that European transnational cooperation including different regions and languages can be highly beneficial and allows relatively small countries and regions (like Carinthia) to get something moving in Europe.*" (Jörg Putzl, Regional Government of Carinthia[332])

[332] Original quote translated into English.

3.5.5. Promoting Clean Public Transport – TROLLEY

3.5.5.1. Aims of the project

TROLLEY addressed the quality, safety and attractiveness of the public transport trolleybus infrastructure in participating CE cities. Within the project, partners worked together on the development of common strategies involving the energy-saving potential of new storage systems for trolleybuses and possible trolleybus network extensions. TROLLEY aimed to address the rising air and noise pollution in urban areas and to mitigate the associated negative effects of climate change. Thus, the ultimate goal was to improve the quality of life of individuals in European cities.

TROLLEY was led by the Austrian corporation Salzburg AG (SAG) and comprised eight additional project partners from six CE countries (one Austrian, two German, one Italian, one Hungarian, two Polish and one from the Czech Republic). The cooperation involved public transport companies (Austria, Hungary and Italy), city authorities (Poland and the Czech Republic) and a university (Poland).

The project claimed total funding of around EUR 3.4 million (78% from the ERDF, 22% national public co-financing) and incorporated five work packages (WPs). WP1 referred to project management and coordination. WP2 and WP3 aimed to develop transferable strategies for trolleybus systems and to create a common understanding on how to operate such a network. WP4 and WP5 focused on the implementation of the concepts developed in WP2 and WP3.

WP2 concerned the communication, knowledge management and dissemination within, and also beyond, the project group. Specifically, the aim was to develop a joint trolleybus declaration and to set up a full e-learning trolleybus module.

WP3 addressed the optimised use of energy. This package included creating a manual and handbook on energy storage types and conversion principles for economically beneficial engines. Moreover, this package also finalised a guide on a trolleybus-tram network.

Based on this, WP4 focused on increasing public transport efficiency. Through this package, the replacement of diesel buses with alternative engines should be intensified. Finally, WP5 aimed to improve the image and patronage of public transport, as well as to establish and ensure a permanent knowledge exchange.

3.5.5.2. Output and results

In the course of this project, a number of outputs were produced. These encompassed the development of a joint strategy, an action plan and an e-platform; the establishment of permanent collaboration; the preparation of investments; and three pilot actions. Around 389,000 inhabitants of partner cities benefited from the improved quality and extension of the public transport systems. Moreover, the project brought further investment and follow-up projects on environmentally sustainable solutions and promoted sustainable and safe mobility. In detail, the outputs were:

Joint strategy and action plan: Declaration for Electric Trolleybus Mobility: the joint strategy was formulated in a joint trolleybus declaration, which was signed by 73 stakeholders (public authorities, research institutions, industry, interest groups and associations) across Europe. Moreover, this declaration should result in the TROLLEY Roadmap process to develop a Trolleybus Research and Innovation Agenda for the future of the trolleybus systems.

Transnational tool: A full e-learning and e-training set: the creation of a full e-learning trolleybus module allowed for the provision of e-learning courses and the pooling of common knowledge, as well as improvement in awareness of the public transport trolleybus infrastructure.

Joint management: The TROLLEY Knowledge Centre: the project established permanent cooperation within the project group and also external experts. Project partners shared and exchanged information as well as knowledge through this platform.

Investment preparation: Investment in new trolleybuses: to prepare TROLLEY pilot investment in trolleybuses. The volume of investments prepared during the project time amounted to EUR 8.13 million. Follow-up investments – both publicly and privately funded – amounted to EUR 43.5 million. This also included the follow-up EU project ACTUATE, which involved the development of eco-driving training for e-buses.

Pilot actions: TROLLEY conducted three planned pilot actions and spent 97% of the planned budget on these. The pilot investments involved the following items:

a) Investment in trolleybuses for testing the on-board energy storage systems
b) Investment in a new battery for Europe's first trolley-battery-hybrid-bus
c) Investment in construction work for an integrated transport corridor.

3.5.5.3. Impact of the project

Policy and governance impacts

The common declaration of WP2 was associated with the development of a Trolleybus Research and Innovation Agenda. This agenda was also integrated into the roadmap of the European technology platform European Road Transport Research Advisory Council on Electrification of Surface Transport. TROLLEY thus contributed to EU strategies, standards and directives on environmentally sustainable transport infrastructure solutions.

The project further helped to stimulate a change in the authorisation procedure of government orders about infrastructure in Szeged (Hungary). The comprehensive planning guide for modern trolleybuses, which also includes a review of the method of reconstruction, constitutes a basis for the change in authorisation procedure.

Sustainability

TROLLEY induced a number of follow-up projects and further investments after the project period (see below). There were planned investments in new trolleybus vehicles and network extensions. Moreover, there was a follow-up Intelligent Energy – Europe project ACTUATE, to train drivers to use the new technologies. Also, TROLLEY surveys on the energy consumption of vehicles and the study to extend a trolleybus line in Salzburg are still used in current operations as references.[333]

Furthermore, the TROLLEY Knowledge Centre guaranteed permanent cooperation between the project partners and allowed knowledge and information to be shared, including with external experts. The TrolleyMotion International Action Group in Austria has administered the management of the permanent cooperation since the project ended. This group has also been responsible for continuing the TROLLEY declaration initiative.

The promotion of environmentally friendly public transport at the local and regional level through the TROLLEY project influenced public opinion and thus facilitated political investment decisions. Thus, amongst other investments (see below) *"TROLLEY was considered a key factor in the modernisation of the city of Salzburg's bus fleet"*, (Alexandra Weiss, Salzburg AG) providing environmentally friendly public transport for local inhabitants and tourists.

Stimulation of investment or initiatives

TROLLEY resulted in a number of follow-up projects and led to further investments. Financed by public funds from Salzburg (Austria), SAG planned to invest EUR 22 million in new trolleybus vehicles and an extension of the network. In the wake of the project results, the city of Brno (Czech Republic) planned to conduct two feasibility studies of a network enlargement, also financed by public funds. In Leipzig (Germany), two follow-up projects – BATTERFLY and SKORPION (financed by the German Ministry of Transport)– aimed to make use of new trolleybus-charging options by exploiting synergies with the tram power supply. A project co-funded by the EU project CIVITAS-DYN@MO invested in a trolley-battery-hybrid-bus in Gdynia (Poland). In Szeged, TROLLEY led to investment in 13 trolley-battery-hybrid-buses and the realisation of a follow-up project Trolleybus Corridor.

Through these further investments and follow-up projects, the project aimed to generate new jobs. During the project period, TROLLEY already created five temporary jobs in the construction sector.

[333] Interview Christian Osterer, Salzburg AG für Energie, Verkehr und Telekommunikation.

Benefits to stakeholders, target groups, general public

In general, the public benefited from TROLLEY thanks to the increased quality of the trolleybus public transport infrastructure. The new technologies allowed negative environmental effects to be mitigated, and therefore contributed – and will further contribute – to an improvement in the quality of life in urban areas. The main direct beneficiaries of the TROLLEY project were those city authorities and public transport operators that operated trolleybus systems, thanks to the improved image of trolleybuses and the opportunity to switch to new and more environmentally sustainable power-storage types. Moreover, industry and research focusing on trolleybus system development benefited from the project through collaboration in pilot projects. They will further benefit from the Research and Innovation Agenda, since this has underpinned future work in this regard.

Overall, the project aimed to reach different types of target groups. The target groups consisted of the following:

- Public sector/administration: by conducting its activities, TROLLEY reached 269 public-sector entities from 41 countries, most of them public transport companies in CE countries. TROLLEY further cooperated with the DG MOVE and DG Regio's press and public affairs department.
- Enterprise/business sector: those private institutions that were reached mainly consisted of European manufacturers of vehicles and suppliers of electric technology for transport. Furthermore, private consulting companies were supported by developing feasibility studies for trolleybus systems in non-trolleybus cities.
- Research/technology development: TROLLEY reached research institutions through the Declaration for Electric Trolleybus Mobility and development of the Trolleybus Research and Innovation Agenda.
- Interest groups: the most important interest group represented international and national public transport associations. TROLLEY contacted the groups via events and conferences that were organised. Cooperation was established with the International Association of Public Transport (UITP).

3.5.5.4. Summary assessment of the project's impact and benefits

In the project TROLLEY, nine partners from six CE countries worked together on innovative and environmentally sustainable strategies for public transport trolleybus systems. The defined common Declaration for Electric Trolleybus Mobility was also signed by other stakeholders across Europe and was embedded in the European technology platform. The TROLLEY Knowledge Centre established permanent cooperation within the project group and also external experts. Sustainable knowledge and information transfer was guaranteed via an e-learning and e-training platform. Moreover, the project induced further investments of around EUR 43.5 million in the public transport trolleybus network.

3.5.5.5. The TROLLEY story

The aim: Promoting the trolleybus transport network and investigating innovations

Partners from Austria, Italy, Hungary, Poland and the Czech Republic followed the common aim to improve urban mobility and to protect the environment. In order to combine these two targets, the partners worked together in a transnational framework to enhance the reputation of the trolleybus system as a sustainable, safe and economic urban transport solution, and further investigated energy-saving technologies to make the use of trolleybuses more efficient. Within the TROLLEY project framework, public transport companies (Austria, Hungary and Italy), city authorities (Poland and the Czech Republic) and a university (Poland) together defined a common innovative strategy for trolleybus infrastructure networks.

The challenge: Finding new technological solutions for trolleybus engines and the conversion of old trolleybuses

Nine project partners from six CE countries worked together to find ways of designing environmentally sustainable engine systems for trolleybuses and to define common concepts for the conversion of old trolleybuses. The main challenge was to find feasible and economically attractive ways of reaching these goals. The project wanted to increase awareness of the possibilities and to encourage other institutions to undertake investments in public transport as well.

The results: Investments in the future for a better life and putting the idea on the agenda

A project budget of around EUR 3.4 million allowed pilot investments in testing new energy-saving power storage types for trolleybuses and developing concepts for the conversion of old trolleybus technologies. Moreover, investments were made in a battery system for Europe's first trolley-battery-hybrid-bus. These pilot actions pointed to the enormous potential of the technologies tested.

From a political perspective, a common strategy was formalised in a declaration, which was also supported by stakeholders from outside the project group; this resulted in an agenda for research and innovation. This agenda was further planned to be embedded in the European technology platform. The project thus contributed to EU policy and put trolleybus public transport on the political agenda.

A handbook and e-platform allowed a permanent and optimal knowledge transfer and aimed to activate institutions from other European cities as well. Through knowledge gained and its transfer, interested institutions received information on best-practice solutions and the best possible support for implementation. They conducted activities that guaranteed a long-lasting and sustainable movement towards environmentally friendly urban mobility.

"*Mobility and public transport are not only basic needs but also fundamental right for all social groups. It is obvious, that this requires a transport system that is reliable and capable to carry a large number of passengers. The trolleybus is an affordable alternative especially in times/regions with limited financial*

resources due to its comparatively lower infrastructure and investment costs." (Alexandra Weiss, Salzburg AG) [334]

Based on the project's impact and the establishment of a strong network within, as well as across, the five countries, including a sustainable strategic focus of the project further induced a large amount of additional investment, both publicly and privately funded. Thus, TROLLEY was a key factor influencing the decision of Salzburg (Austria) to invest in new trolleybus vehicles and an extend the network. In the wake of the project results, the city of Brno (Czech Republic) planned to conduct two feasibility studies of a network enlargement, also financed by public funds. In Leipzig (Germany), two follow-up projects – BATTERFLY and SKORPION (financed by the German Ministry of Transport)– aimed to make use of new trolleybus-charging options by exploiting synergies with the tram power supply. The EU co-funded project CIVITAS-DYN@MO invested in a trolley-battery-hybrid-bus in Gdynia (Poland). In Szeged, TROLLEY led to investment in 13 trolley-battery-hybrid-buses and the realisation of a follow-up project Trolleybus Corridor.

[334] Original quote translated to English.

3.5.6. Revitalisation of Urban River Spaces – REURIS

3.5.6.1. Aims of the project

The main objective of the project was to implement strategies and activities aimed at the reconstruction of natural and cultural resources and the management of urban river spaces.

The project's approach required the transfer of knowledge and know-how that involved formal and informal connections between various CE regions. With respect to the specific local watercourses, each partner was interested in tackling three major tasks:

1) To find a holistic approach to the entire process of planning, designing and bringing about revitalisation, together with raising local communities' interest in the quality of urban river spaces,

2) To improve public access to open space along the river, developing the valley as the city's green axis, while at the same time taking into account recreational needs, tourism, cultural heritage aspects, upgrading flood protection and storm water management, and improving natural habitats in river corridors,

3) To develop procedures for cooperative planning of urban river space and appropriate consensus-finding methods, as well as designing and implementing investments.

A transnational approach, as well as common lessons from the partners' experience, supported the process of breaking formal, organisational and mental barriers to better management of river space. The main contribution to the goals of the CE Programme was the elaboration of transnationally solutions for integrating environmental, social, economic and spatial aspects of revitalisation.

The activities realised within the project allow future generations to take advantage of river valleys, as those activities were aimed directly at increasing the attractiveness of the environment, as well as the development of cities and regions. The main factor in the success of the project was the genuine involvement of local stakeholders and professionals. The REURIS team aimed at overcoming the formal and procedural problems concerning implementation of pilot investments in urban river valleys.

3.5.6.2. Output and results

Main achievements:

1) An innovative, transnationally approach to the revitalisation of degraded urban river space has been elaborated.

2) This approach has been demonstrated in practice.

3) It has been proven that complex projects in urban river valleys can be planned and implemented with public participation. It was demonstrated how it is possible to increase the spatial

functionality and attractiveness of urban river valleys, with a simultaneous reduction in environmental hazards, including floods, as well as the partial restoration of previous natural resources.

Transnationally valid recommendations for:

- Planning and implementation methods
- Stakeholders' involvement, including participative planning
- Financial and economic issues.

Output indicators:

- A joint strategy and action plan was developed: the REURIS *Manual for Urban River Revitalisation* has been published in English and Polish.
- The handbook *Urban Rivers – Vital Spaces: Manual for Urban River Revitalisation* has been published in English, Polish and German.

Six pilot actions have been implemented:

- in Katowice: revitalisation of part of Ślepiotka River valley
- in Bydgoszcz: Degraded part of the Park along the Old Bydgoszcz Canal;
- in Stuttgart: revitalisation of the Feuerbach Stream on a former sports field next to Zazenhausen;
- in Leipzig: Thostbach in Grimma – Ecology and Flood Protection
- in Brno: creation of green corridor along artificial river fork in post-industrial area: Old Ponavka
- in Pilsen: establishment of local biocentre in riverside as an element of future ecological network of the city in Plzen.

3.5.6.3. Impact of the project

Policy and governance impacts

At the start of the project, each partner possessed just fragmentary experience of planning or carrying out activities similar to those envisaged under REURIS. Past experience of partners relating to revitalisation was not always related to rivers. The experience was limited only to certain aspects of the revitalisation. None of the partners would have been able independently to perform tasks combining participative planning, design and implementation of complex, innovative solutions. Only by working together in REURIS could the stakeholders develop a holistic approach to revitalisation that took account of the specificity of the river valley in each city.

The Office of Urban Planning and Urban Development in Stuttgart contributed to the integration of social, economic, environmental, legal and spatial aspects of revitalisation. The participation of Leipzig University allowed the elaboration of a common approach to public participation in the whole planning/implementation process of revitalisation, including consensus-finding procedures and cooperative planning techniques. The participation of partners from Brno and Plzeň (Czech Republic) allowed a better understanding of the role of experts in revitalisation planning. The participation of

partners from Bydgoszcz, Katowice and Leipzig supplied practical examples and allowed common lessons to be extracted from the process of preparation and implementation of revitalisation activities. The continuous exchange of experience concerning pilot actions has allowed better understanding of the challenges and opportunities for the coordination of activities across different sectors, especially at the local and regional level. Each partner took on similar challenges of inter-sectoral coordination at the local level. Stuttgart's approach – involving clear, repeatable procedures, reconciliation activities between departments dealing with municipal services, urban planning, environmental protection, etc. – was successfully used in Katowice and Bydgoszcz. An approach involving a number of bilateral consultations, proposed by the Leipzig partner, also brought positive results and proved particularly effective in the case of a planned activities agreement between the local government and water administration at the regional level (especially useful for participants from Poland).

Sustainability

The results of the REURIS project – especially the recommendations of the Manual and the achievements of the pilot actions – were incorporated into local development plans and programmes. In Stuttgart, Leipzig and Bydgoszcz already existing informal plans at the local and regional level were updated.

"*In Stuttgart, REURIS has become part of the extensive revitalization and conservation activities of the rivers there. The main aim of pilot action there was to remove the paved river banks of the Feuerbach and to transfer the stream course to the middle of the floodplain. As the city council accepted the concept of future scenarios developed in the context of REURIS and approved detailed planning for future scenarios concerning the River Neckar. Also in Leipzig– REURIS has become a part in broader actions to restore the river to the city*." (Malgorzata Markowska Central Mining Institute - Department of Water Protection, Katowice)

In Katowice, the delineation and land use proposal for the river corridor were fully incorporated into a study on the conditions and directions of spatial management. The approach to habitat protection/creation in urban river valleys – as demonstrated through a pilot action in Katowice – was incorporated into the Silesian Voivodeship's Nature Protection Strategy.

The approach to urban river valley revitalisation elaborated under REURIS is being transferred into practice in other cities and self-government entities: a dozen municipalities in the region of Cieszyn Silesia (Poland) established a common initiative for revitalisation focused on the creation of public spaces in river valleys where the restoration of nature resources will be integrated with recreation and tourism.

From 2014, former REURIS participants started working on applications concerning the revitalisation of urban river spaces. These activities are aimed at the creation of ecosystem services and a general improvement in public space quality/availability.

As a long run effect REURIS improved the quality of life in the areas of its pilot actions. For example, reviving degraded parts of the park along the Bydgoszcz Old Canal gave it a new function, increased biodiversity, and made the water course more attractive and created possibilities for society to have a

contact with water. In this way, a previously neglected area along the canal was transformed into a recreation area frequently used by residents.

"*Also in Katowice the pilot investment in the Ślepiotka valley made a change – as even today, after six years of project's end, local inhabitants enjoy spending their free time in this revitalised area. The pilot investment in Katowice has been focused on improvement of public access to the river and development of a recreational area, as well as improvement of the environmental quality of the place and demonstration of possibilities of habitat restoration with use of soil bio-engineering methods*."
(Malgorzata Markowska Central Mining Institute - Department of Water Protection, Katowice)

Benefits to stakeholders, target groups, general public

The most important additional benefit of the cooperation was the involvement of local communities in the management of public spaces, as well as a general increase in local/regional decision makers' motivation for sustainable land use in urban river valleys. The knowledge and know-how transferred as a result of the cooperation can be applied in river valleys and in other areas, especially with regard to the elaboration and implementation of programmes and plans concerning the revitalisation of public spaces.

Public participation in the revitalisation process, and the possibility of a multifunctional utilisation of redeveloped river valleys, proved to be a good way of increasing the cohesion of the local and regional communities. This achievement is particularly relevant in the context of the CE 2007-13 Programme objectives. Assuming that the recommendations concerning revitalisation and the management of urban river spaces are followed, the activities realised within the project will allow future generations to take advantage of river valleys. The innovative, holistic strategic approach addressed several issues: ecological, economic, spatial and social. It helped elaborate a common set of methods, tools and procedures for dealing with the challenges of urban river revitalisation.

There were substantial synergies between REURIS and several other projects in the CE territory of Intervention 4.1 'Attractiveness and Competitiveness', especially with reference to public participation procedures in the process of urban area revitalisation. The REURIS partners from Stuttgart and Bydgoszcz were at the same time participating in the CE project COBRA MAN, and this resulted in an increased competence concerning REURIS public participation issues. Parallel to REURIS activities, the Stuttgart Municipality implemented a project co-financed from a Life+ Nature and Biodiversity component. The investment area was located in the same river valley, in the vicinity of the REURIS pilot investment area. From a practical point of view, these two investments were complementary.

The REURIS approach to river valley revitalisation is complementary to the idea of a river corridor as a blue-green axis of the city, and so it can be helpful for Life+ Environmental Management applicants. Bioengineering solutions similar to those implemented in river spaces in Katowice, Stuttgart and Leipzig, as well as ecosystem services similar to those created by pilot investments, are the object of interest of Life+ Nature and Biodiversity projects. The REURIS approach was inspiration for CMI to submit a project proposal to the Life+ Nature and Biodiversity component. The project has involved two kinds of actors beyond the project consortium: local communities (represented in the project by local support groups) and representatives of the regional and local expert environment (forming a consultation group). The achievements of REURIS are the subject of interest to Ukrainian scientists and regional and local government bodies seeking support in the preparation and implementation of revitalisation projects.

3.5.6.4. Summary assessment of the project's impact and benefits

With a budget of EUR 3.4 million and eight participants from three Central European EU Member States, the REURIS project made an important contribution to changing the perception of urban river spaces from a threat (due to floods) into a benefit. The project demonstrated that this change is possible in the case of improved landscape water management. Relying on good practices in the region, pilot actions were undertaken and the experiences summarised and made available to other organisations in two valuable practical manuals.

3.5.6.5. The REURIS story

The aim: To change urban rivers from a threat to a benefit

For decades, urban rivers in Central Europe were seen as a threat rather than a benefit. Accordingly, although river spaces are principally important reservoirs of biodiversity and open space in riverside cities, in Central European cities it was common for them to be neglected and abandoned. Managing river areas to link their natural value with landscape and recreational values has been the aim of some projects implemented under EU programmes, but REURIS was the first EU-supported project to have tackled these issues in the CE territory.

The challenge: Developing the river valley as the city's green axis and simultaneously upgrading flood protection

The essence of the project was to help initiate and implement strategies and activities aimed at the reconstruction of natural and cultural resources and the management of urban river spaces. This required the transfer of knowledge and know-how, and involved formal and informal contacts between various CE regions. The major tasks were: first, to find a holistic approach to the entire process of planning, designing and bringing about revitalisation; secondly, to improve public access to open space along the river, developing the river valley as the city's green axis; and thirdly, to take into account recreational needs, tourism and cultural heritage aspects, while simultaneously upgrading flood protection and storm water management.

The results

Pilot actions including investments have been implemented in:

- Katowice: revitalisation of part of the Ślepiotka River valley,
- Bydgoszcz: revitalisation of a degraded part of the park along the Old Bydgoszcz Canal,
- Stuttgart: revitalisation of the Feuerbach Stream on a former sports field next to Zazenhausen,
- Brno: creation of green corridor along an artificial river fork in the post-industrial area of Old Ponavka,

- **Pilzeň**: establishment of a riverside bio-centre as an element of a local future ecological network.

Two handbooks were compiled on the basis of the project's results in order to allow other stakeholders to use the experiences accumulated in the REURIS project.

Public participation in the revitalisation process, and the possibility of a multifunctional utilisation of redeveloped river valleys, proved a good way of increasing the cohesion of the local and regional communities. This achievement is particularly relevant in the context of the CE Programme objectives. Assuming that the recommendations concerning revitalisation and the management of urban river spaces are followed, the activities realised within the project will allow future generations to take advantage of river valleys. The innovative, holistic strategic approach addressed ecological, economic, spatial and social issues. It helped elaborate a common set of methods, tools and procedures to deal with the challenges of urban river revitalisation. Besides that REURIS benefitted the cities' inhabitants by creating new and popular recreational areas. "A*lso in Katowice the pilot investment in the Ślepiotka valley made a change – as even today, after six years of project's end, local inhabitants enjoy spending their free time in this revitalised area.*" (Malgorzata Markowska Central Mining Institute - Department of Water Protection, Katowice)

3.5.7. Adaptation to flood risk in the Labe-Elbe river basin – LABEL

3.5.7.1. Aims of the project

LABEL was aimed at improving the flood risk management approaches and tools in the river Elbe and neighbouring basins.

To reach the goal, several objectives were defined:

- Harmonisation and coordination of risk assessment and management systems and tools in a transnational approach; joint elaboration of risk assessments and maps by participants from different countries;
- Adaptation of utilisation in high-priority fields (tourism, water transport), in order to reduce flood risk, including conflict solving between risk management and different land use options;
- Elaboration of exemplary solutions for the integration of economic development and flood risk management.

3.5.7.2. Output and results

The major overall result of the activities was the LABEL strategy Labe-Elbe 2012plus, which included all partner contributions and a joint vision for the adapted development of the river basin to take account of the flood risk. The project contributed to solving the flood risk problems in Central Europe by supporting cities, municipalities, infrastructure operators and the public in adapting to flood risks.

The most significant outputs of the project were:

- Flood hazards and risk maps for the Elbe/Labe river and its tributaries;
- Flood risk management plans for pilot areas;
- Development and adaptation concepts for tourism and urban usage in risk areas;
- Concept for dealing with navigation under flood aspects;
- Diverse local and regional implementation of risk adaptation measures;
- Raising awareness of flood risks and their management.

Joint strategy

One of the main joint outputs was the transnational LABEL strategy for adaptation to flood risks in the Elbe catchment, which summarises all the project results and achievements. It also contains recommendations and provides an outlook for future flood risk management in the Elbe Basin. The goal set was completely achieved.

Pilot actions

Within the 19 local pilot actions, daily planning and approval practice of flood risk-oriented and adaptive solutions was improved– e.g. pilot actions on the flood risk-adapted spatial planning in Saxony, the risk-adapted regional development concept in South Bohemia, and the risk-oriented development of water-

tourism measures in Saxony-Anhalt and Central Bohemia. Local and regional implementation of the joint adaptation strategy reduced the flood risk significantly. Awareness of the importance of these issues was raised by continuous and long-term transnational, interregional and inter-municipal cooperation. Activities like the Flood Partnership of Municipalities along the Elbe, a mobile exhibition that visited many different locations, local and regional flood risk workshops, and cooperation with schools and environmental education agencies on flood awareness issues contributed to a shift in public behaviour towards a risk-oriented society.

Tools developed

By using the LABEL-developed hydraulic simulation tool FLYS, German and Czech partners assessed the impacts of flood risk management measures in the upstream areas (in the Czech Republic and along German headwaters) on downstream regions. In the course of this cooperation, which was led by the German Federal Institute for Hydrology (BfG) and the Czech Masaryk Water Research Institute, the effects of measures on cities along the Elbe river were gathered. This module of the project could be extended and more simulations were performed (even after the project ended, from their own budgets). The studies were also supported by the International Commission for the Protection of the Elbe River (ICPE). FLYS has been used by different water management authorities since 2012.

INGE, an instrument for the planning and implementation of emergency measures, had its software redesigned. The tool was implemented in a municipality in Thuringia, and a training workshop on the new features was held once the tool was ready. The users of INGE include emergency management, municipalities and planning authorities.

Permanent cooperation

The LABEL partnership was developed as a lasting cooperation network of interdisciplinary organisations in charge of spatial planning, water management and tourism. The network worked jointly on flood risk management and risk-mitigation strategies and implementation on a longer-term basis. The partnership decided at the final meeting of the project to carry on with the cooperation. The LABEL partner organisations plan to meet twice a year to discuss current challenges in flood risk management.

Results summarised

LABEL contributed to strengthening territorial cohesion in Central Europe. This was achieved by fostering intensive cooperation between different sectors (water management and spatial planning) and levels of administrations (the partnership comprises one county, several regional administrations, state and national ministries). That was confirmed by the positive response from target groups at the events and conferences organised. The recommendations drawn up and summarised in the LABEL strategy show the future prospects for the sustainable, risk-adapted development of a competitive economy focusing on strong transnational cooperation in Central Europe.

3.5.7.3. Impact of the project

Policy and governance impacts

Transnational and national level

- The joint study by the German BfG and the Czech Masaryk Institute showed extensive effects; it proved that the management of upstream barrages has a huge impact on downstream areas all along the Elbe river.
- The BfG started working with the ICPE to include the results in ICPE policies; German water-management decision makers await updates of the calculations.
- The cooperation and exchange between the LABEL partner countries concerning the Flood Risk Management Directive provided further positive impacts: methods and approaches were coordinated and partly harmonised across the Elbe Basin countries at an early stage of implementation.
- The implementation guide for flood risk management plans (in respect of the EU Floods Directive) that was developed in the LABEL Working Group RISK provided input to German and Czech policy preparation activities.
- The Czech LABEL partners Ministry of the Environment, PLA (Povodí Labe – Elbe/Labe Basin Authority) and PVL (Povodí Vltavy – Vltava Basin Authority) gave input to the national standards for flood risk management plans.

Local level

- Region of Central Bohemia: a concept for anti-flood measures (identification of weaknesses in flood protection in the region and identification of technical measures) was included in the regional development plan.
- Region of Saxony-Anhalt: seven counties implemented the regional concept (interdisciplinary assessment of problems in the region and proposal for sustainable and flood-adapted solutions) for the area (or parts of it) in their planning documents.
- Tourist area of Böhmerwald: the new aspect of water management and historical cross-border waterway usage (content of a LABEL pilot action) was integrated into the regional tourism education centre and the region's marketing portfolio.

Sustainability

Several of the LABEL results have already been integrated into the policies of the regions or at the local scale. More policy improvements are expected in the near future, as many partner organisations continue the LABEL activities by updating tools and methods or expanding calculations. Initiatives to ensure financial resources for this work are in hand.

Importantly, the project contributed to reduction of current and future flood risk. "*Also, the cooperation of partners is sustainable, as the network of cooperating organisations is still working and has already created different new activities, like new transnational projects, transboundary cooperation and communication beyond the project itself. Still, network cooperation was subject to changes, due to*

differences in the availability of resources among partners, changing staff and differences in other framework conditions". (Peter Heiland, Infrastruktur & Umwelt)

Benefits to stakeholders, target groups, general public

The project LABEL has reached the defined target groups effectively thanks to several project activities:

- Politics workshops, regional information seminars, local conferences
- Transnational conferences: kick-off, mid-term and final conferences
- Events at fairs and public events: Euregia, WATENVI, Gläsernes Regierungsviertel
- Cross-project exchanges.

The main target groups – planners and decision makers at the local and regional level, plus authorities at the regional and national level – were counted toward the indicator 'entities of the public sector/administration'; this target value was exceeded by more than 50%. Additionally, the following activities had a major outreach to relevant stakeholders and target groups:

- Mobile exhibition
- Media contest on flood risk management
- Media communication (newspaper, websites, TV coverage)
- Communication of results on pilot actions.

LABEL activities reached the public at large mainly through 25 exhibitions in various regions of the Elbe Basin, the media contest and project days for schoolchildren.

LABEL improved the transnational and interdisciplinary cooperation of water management, spatial planning, nature conservation, disaster risk management and other disciplines dealing with the flood risk management and the adaptation to climate change. The project created the platform for joint implementation of risk reduction measures throughout the Elbe-River Basin and beyond.

"A *lot of activities, like awareness raising for flood risk reduction, forecasting and improving disaster preparedness were realised in the project trough pilot activities in cooperating cities. For example, the Czech-German cooperation on the forecast and discharge control in reservoirs and retention areas was significantly improved. As a consequence, in the occurrence of floods water is much more effectively restored in the upstream areas (Czech Republic) to increase the risk reducing effects on the neighbour-country (Germany) and its different regions. Overall, LABEL reduced flood risk in Central Europe, especially in the Elbe river basin*". (Peter Heiland, Infrastruktur & Umwelt)

3.5.7.4. Summary assessment of the project's impact and benefits

With a total budget of EUR 4 million and 20 participants from four Central European EU Member States, the LABEL project made an important contribution to intensifying cooperation in the Elbe catchment area. Major progress was made in the harmonisation and coordination of approaches to risk management between the different states and countries in the Elbe Basin, in coordination with the Danube Basin. This was especially important for the implementation of the European Flood Risk

Management Directive. Through regular transnational exchange, the responsible stakeholders exchanged views and methods and harmonisation was reached on many aspects.

3.5.7.5. The LABEL story

The aim: Reducing flood risk

LABEL aimed at the improvement of flood risk management approaches and tools in the river Elbe and the neighbouring river basins. Since the source of risk is usually in regions other than where it has an impact on land uses, transnational river basins call for transnational cooperation and joint actions.

The challenge: Catastrophes have a short memory

'Catastrophes often have a short memory': that is especially true of flood events. In periods without bigger floods, the acceptance of precautionary measures and preparation for such events is limited. The 2002 Central European flood was a bitter reminder of this. The project LABEL had the mission to develop products for both stakeholders and the public to enhance awareness of the risks.

The results: "*Improving living conditions and creating a safer natural environment for many cities, regions and especially for the people living in them*". (Peter Heiland, Infrastruktur & Umwelt)

To provide flood hazard and risk maps for the entire Elbe stream, an 'Elbe Atlas' was created. This atlas is used to inform stakeholders and the public about the flood hazards and risks in the Elbe catchment area. The maps in the atlas are regularly used as a basis for flood risk assessments and flood risk management by municipalities, planning institutions and flood risk management bodies (as during the May 2013 flood event, when the atlas was used by many municipalities, such as Dresden in Germany or Ústí nad Labem in the Czech Republic).

Harmonised management systems were adopted by 18 regional public authorities. In the context of flood risk assessment, a new method was introduced and implemented. Additionally, existing retention measures were assessed and methods worked out for improved management. This was implemented by the respective regional administrations. Three studies on possible retention in the upper middle Elbe region, Plzeň and South Bohemia were elaborated. Existing retention areas were checked for suitability and protection status and new areas were identified for future development of flood retention. The plans were adopted in the regional development plans of the regions Plzeň, South Bohemia and Ludwigslust. "*Overall, LABEL reduced flood risk in Central Europe, especially in the Elbe river basin*." (Peter Heiland, Infrastruktur & Umwelt)

A 'Regional Concept Upper Middle Elbe' was elaborated, following close cooperation between neighbouring regions. They all adopted the strategy, with recommendations for the major cross-sectoral topics of the region: flood risks, climate change, river-related economy and demographic change. Demographic change, migration and brain drain are huge problems in the region, as it is very peripheral. The strategy was adopted in seven regions, of which only one was a formal partner of the LABEL project.

In the context of navigability and flood management, new solutions for transport systems (public transport and inland navigation) in the Orlík area (Czech Republic) were adopted. Regular boat traffic across the lake will support the local public transport system and enhance sustainability in this sector. The pilot action Chodouny-Lounky prepared the investment for flood protection measures (walls and dams) for the villages of Chodouny-Lounky. The measures were approved. Costs for the investment in Chodouny-Lounky (prepared in the named pilot action) are estimated at EUR 1.7 million, financed by the national budgets for water management.

3.5.8. Paving the way for self-sufficient regional energy supply based on sustainable energy concepts and renewable energy sources – MANERGY

3.5.8.1. Aims of the project

MANERGY aimed at helping to reach the EU 20/20/20 targets in the field of energy: a reduction in both energy consumption and GHG emissions by 20% and achievement of a 20% share of renewable energy by year 2020.

The general aim of the MANERGY project was to facilitate the responsible use of the environmental potential of Central Europe and contribute to a reduction in GHG emissions. To this end, it aimed at a) increasing the use of renewable energy, and b) reducing energy consumption. The explicit focus of the MANERGY project was on local municipalities and public buildings, given that the energy consumption of urban areas represents a significant volume of overall energy consumption in the EU.

The MANERGY project's specific objectives were as follows:

- Elaborate transnational planning tools for local authorities in the CE territory;
- Set up a transnational supporting network of energy management, assisting municipalities with technical advisers, databases and methodological support;
- Deliver local energy concepts and action plans that pave the way for energy self-sufficiency; and last but not least,
- Raise awareness of the benefits of renewable energy supply and energy savings.

The MANERGY project had an overall budget of some EUR 1.17 million, 80% of which was provided by the ERDF and the remainder co-financed from public national sources.

The project lasted from May 2011 till July 2014 and had six partners from six CE countries, representing both public administration bodies and academia. The project was led by the South Transdanubian Regional Development Agency (Hungary), while other partners included the University of Maribor (Slovenia), the Saxon Energy Agency (Germany), the ARLEG S.A. Regional Development Agency (Poland), the Province of Treviso (Italy) and the EU Regional Management East-Styria (Austria).

3.5.8.2. Output and results

In general, MANERGY project partners not only met, but exceeded the objectives of the project. To facilitate implementation of the main project goals (reducing energy consumption and encouraging greater reliance on renewable energies), the MANERGY project produced the following deliverables.

The project delivered **a comparative study of energy concepts** – a transnational document that aimed at showing the differences between the points of view in the project partner countries regarding the construction of a regional energy concept.

The transnational study on energy agencies compared the regional analyses of the partners, in which they examined the prerequisites for the establishment and steady functioning of an energy agency. This study and the above-mentioned comparative study of energy concepts provided grounds for defining the scope of activities and deciding on the legal form of the energy agencies. Besides, the project partners developed **six regional energy concepts,** which were used by the regional administrations for energy planning. Also, the project delivered **a handbook on developing energy concepts**, which provided support for municipalities to work out their local energy concepts on their own.

To ensure that the assistance to local communities provided by MANERGY partners in the course of project implementation was maintained after the project ended, the partners prepared business plans for the establishment of energy agencies in each region. All in all, the project elaborated **six business plans for energy agencies**, which described the organisational structure, activities, financing, marketing and cooperation of regional energy agencies. To this end, they analysed the legal and financial requirements and organisational structures which support the energy management of municipalities, inhabitants and enterprises. The Austrian project partner even launched its energy agency – although this was not the initial objective of the MANERGY project.

The handbook of developing energy concepts was implemented by the elaboration of local energy concepts and local energy action plans. In total, **19 local energy action plans** for in total 34 settlements were elaborated. These plans included proposals for investments in order to achieve higher energy efficiency and greater use of renewable energy sources by 2020.

A **steering committee** and a **technical board** were set up at the beginning of the project to ensure a continuous flow of information. Its tasks included management duties, but also establishing professional contacts and providing necessary knowledge on technologies, decision-making methods, legislation and investment possibilities. Importantly, these structures were maintained after the end of the project: three new transnational project ideas have been drawn up, and one has already been adopted (TREND, ERASMUS+).

In the local energy action plans, **investments worth EUR 166.5 million** were envisaged, including a biogas plant and several insulation and solar collector investments. All in all, 34 settlements (with a combined population of 429,407 inhabitants) were involved in MANERGY, whose local energy action plans were elaborated by the partners.

Going beyond the initial objectives of the project, the Italian and Hungarian partners decided to support the accession of 3 Italian and 18 Hungarian settlements to the Covenant of Mayors initiative; this came about in 2013.

To raise awareness of the benefits of energy savings and renewable energy, the project participants organised four transnational conferences (two in Pécs (Hungary), one in Dresden and one in Brussels) and 84 regional working groups.

To supplement the other project achievements outlined above (successful investments, provision of relevant expertise to local communities, preparation of business plans of energy agencies, etc.), a common platform was created in the wake of project implementation; this has supported local municipalities in their energy management even since the MANERGY project ended.

3.5.8.3. Impact of the project

Policy and governance impacts

The most important policy impact of the MANERGY project was a fundamental change in the way of policy making by municipalities in the area of energy management. Prior to the project, most investment ideas had an ad hoc character and responded only to open calls for different tenders. This was changed, as the planning activities of municipalities in the field of energy management were built up. MANERGY gave them an innovative planning methodology, contacts and ideas for successful investments.

In the policy area, MANERGY project traced three parallel lines of activities:

1. The project partners analysed the status quo of public energy consumption, with a focus on the heat loss and efficiency of building engineering systems in public buildings, street lighting, public transport and employees' behaviour, and drew up recommendations for policy intervention. Parallel to that, analysis of local renewable energy sources and their representation on a map showed the potential for the utilisation of these resources in making the energy systems more efficient.
2. The second field of activities broke down the regional conclusions at the local level. The project partners elaborated local energy concepts, which were further transformed into 'pilot actions', i.e. local energy actions plans (in Italy and Hungary, using the methodology of the Covenant of Mayors). The fact that some of the municipalities have successfully applied for sources of funding to implement these plans (such as the LEADER group in Hungary) shows that the content of the actions plans was realistic, based on an examination of the local possibilities.
3. The MANERGY project built a transnational network that could support the energy planning activities of municipalities by elaborating business plans for energy agencies. These plans thoroughly examined the needs of local municipalities, recommended functions for the energy agencies based on these findings, and also examined how these non-profit public organisations could be maintained in a sustainable way.

Sustainability

The political sustainability of the project results was ensured by the fact that the local/regional energy action plans/concepts were generally approved by the legislative bodies of the settlements/territorial units involved. New projects have been submitted, and the project TREND under the Erasmus+ Programme in Hungary has been selected. Finally, the creation of energy agencies will ensure the institutional sustainability of the project results (in Austria, the energy agency was set up even during project implementation).

The project results have been mainstreamed at three levels of governance: local, regional and EU. At the local level, this has been achieved via the elaboration of 19 local energy action plans/concepts, which have directly influenced the energy management processes of the municipalities involved. At the regional level, the regional energy concepts elaborated during the project defined the way of energy efficiency and renewable energy exploitation actions. At the EU level, the mainstreaming of the project results took the form of informing the Covenant of Mayors of the problems with the energy data and advising it to plan calls for data collection systems, automated meter readings and smart metering.

Probably most importantly, the project laid the foundations for substantial investment in energy efficiency and renewable energy at the local level. In total the project stimulated investment worth EUR 166 million. The biggest single investment has been the EUR 6.6 million construction of a biogas plant in Hungary, partly as a result of the energy action plan drawn up under the MANERGY project.

Benefits to stakeholders, target groups, general public

The primary target group of the project was local municipalities in the CE territory, whose energy management duties were hugely assisted by the project implementation. In particular, prior to the MANERGY project, the municipalities often lacked the necessary knowledge and human capacity for energy management: they were not aware of the energy consumption, could not find leakages and sparing points, and did not have the information and experience to define the pool of and priorities for the necessary energy investments. When they intended to apply for financial sources, they often had to contract experts, which represented a heavy burden on their budgets. The MANERGY partners helped solve the above problems by elaborating the guidelines which could be used by the local municipalities in their energy management, as well as providing energy data, available technologies, and non-technological interventions.

The following groups of stakeholders benefited from the MANERGY project:

- In the wake of the project implementation, a wide range of stakeholders, including decision makers, energy experts, renewable energy investors, and universities and researchers gained insight into the energy management of the involved areas.
- Besides, the project helped them establish contacts and thus they gained the ability to cooperate, which has been crucial in solving some of the problems related to energy efficiency and renewable energy. For instance, smaller municipalities realised in the wake of the project implementation that they could apply for renewable utilisation sources more efficiently if they acted jointly.
- Other important stakeholders in the project were local enterprises and organisations, whose knowledge of energy efficiency and renewables – and thus their motivation to undertake investments in these areas – was greatly enhanced in the course of the project.

All in all, the project has directly benefited six regions in the CE territory (South Transdanubia, Maribor, Saxony, Lower-Silesia, Province of Treviso and East Styria) and 34 settlements at the local level.

3.5.8.4. Summary assessment of the project's impact and benefits

With a total budget of less than EUR 1.1 million, the MANERGY project laid the foundations for energy management by municipalities in 34 settlements across 6 Central European countries, with a combined population of 429,000 inhabitants. By exchanging know-how and providing recommendations, it radically improved the policy making of local municipalities in the field of energy. Most importantly, it paved the way for EUR 166 million worth of investment in energy efficiency and renewable energy, with some of those investments (notably a biogas plant in Hungary) even implemented during the project lifetime. It can thus be considered a success.

3.5.8.5. The MANERGY story

The aim: Contributing to the attainment of the EU 20/20/20 energy targets in Central Europe

The general aim of the MANERGY project was to facilitate the responsible use of the environmental potential of Central Europe and contribute to a reduction in GHG emissions at the municipal level. Prior to the project, the municipalities often lacked the necessary knowledge and human capacity for energy management: they were not aware of the energy consumption, could not find the leakages and sparing points, and did not have the information or experience to define the pool of and priorities for the necessary energy investments. Most investment ideas had an ad hoc character and responded only to open calls for different tenders.

The challenge: Improving the energy management of local municipalities and laying the foundations for energy investments

With a total budget of less than EUR 1.1 million (of which 80% came from ERDF and the rest was co-financed from national public sources), the MANERGY project lasted from May 2011 till July 2014 and aimed at providing guidelines for energy planning at the local level when it comes to energy efficiency and the use of renewables. It focused on 34 settlements across 6 Central European countries (Hungary, Poland, Austria, Germany, Slovenia and Italy) with a combined population of 429,000 inhabitants.

The results: Business plans of energy agencies and a biogas plant in Hungary

The MANERGY project partners not only met the objectives of the project, but exceeded them.

At the beginning of the project, a steering committee and a technical board were set up, in order to establish professional contacts and provide necessary knowledge of technologies, decision-making methods, legislation and investment possibilities. Importantly, these structures have been maintained since the project ended.

The project delivered a comparative study of energy concepts and a transnational study on energy agencies. These two studies provided grounds for defining the scope of activities and deciding on the legal form of the energy agencies. Besides, the project partners developed six regional energy concepts, which have been used by the regional administrations for energy planning, as well as a handbook on developing energy concepts, which has provided support for municipalities in working out their local energy concepts on their own.

The project partners prepared six business plans for energy agencies, which described the organisational structure, activities, financing, marketing and cooperation of the regional energy agencies. The Austrian project partner even launched its energy agency – although this was not the initial objective of the MANERGY project. Based on this, the project elaborated 19 local energy action plans and assisted directly in the energy planning for 34 settlements. These plans included proposals for investments in order to achieve higher energy efficiency and the greater use of renewable energy sources by 2020.

Arguably, the project's main achievement was the elaboration of business plans of regional energy agencies (with one of them, in Austria, already set up during the project), laying the foundation for some EUR 166 million worth of investments in the area of energy. A biogas plant in Hungary (worth EUR 6.6 million, albeit only partly within the MANERGY framework) as well as several insulation and solar collector investments have already been constructed. Last but not least, to supplement the above project achievements, a common platform was created in the wake of project implementation, which has supported local municipalities in their energy management even after the end of the MANERGY project.

3.5.9. Demonstration of energy efficiency and utilisation of renewable energy sources through public buildings – CEC5

3.5.9.1. Aims of the project

CEC5 was a project financed under the CE 2007-2013 Programme. Its main objective was to contribute to the attainment of the EU 20/20/20 targets (reduction in GHG emissions of 20%, improving energy efficiency by 20%, and reaching a 20% share of renewables) in the specific area of public buildings, with a view to using this as a blueprint for other (private sector) buildings as well.

The CEC5 project was set up by a transnational consortium of ministries, municipalities, energy and development agencies, regional authorities and a chamber of architects. Specifically, the project included 12 project partners from 8 CE countries including Austria, the Czech Republic, Germany, Hungary, Italy, Poland, Slovenia and Slovakia.

The project lasted from October 2011 till December 2014 and had a total budget of approximately EUR 4 million. Around 81% of the total budget was provided by the ERDF and the bulk of the remainder co-financed from national sources; private co-financing was a mere EUR 14,700.

The goal of the CEC5 project was to set up a model of reference for a low-emission building of high quality and to check this model in practice. The idea behind this was to elaborate standards for public buildings that would combine high quality (comfort of users) and high environmental standards (low energy consumption, high reliance on renewable sources of energy) at the same time. This would then allow decision makers to build energy-efficient high-quality buildings.

Another project goal was to create an energy-efficiency knowledge platform for the CE Programme area for popularising renewable energy and energy-efficiency solutions in public buildings, with transnational cooperation playing a key role. The idea was to facilitate the transfer of knowledge and know-how from countries that are more advanced in this area (such as Austria or Germany) to countries where low-emission public buildings hardly exist at all (such as Poland or Slovakia).

3.5.9.2. Output and results

To achieve the project goals, the project partners started with a joint transnational evaluation of assessment criteria for ecological public buildings and the development of a certification procedure. At this stage, the project produced three strategy documents:

- A transnational baseline for energy-efficient building, which gave an overview of national conditions grouped in five main topics;
- A transnational joint strategy (formulated as a joint agreement); and
- The model certification summary of 24 public buildings, based on the results of the model assessment and summary of demonstration buildings.

Most importantly, the project launched a helpful tool to assess a building's quality in the form of CESBA – Common European Sustainable Building Assessment, which recognised the benchmarks set by the

'nearly zero energy buildings' requirement stipulated by EU legislation. CESBA provides a systematisation of methods for the assessment of a public building throughout the entire cycle of its operation: from planning, design and construction through to its use and impact on the environment. To this end, CESBA used the best practices of existing methods of buildings certification (such as PHPP and Ecosoft), but also introduced its own criteria, taking the comfort of users as its priority.

The 'CESBA Guide' produced by the project is a booklet which steers the reader through the stages of building assessment and the very philosophy of carrying out a focused and planned investment process. For this tool, eight nationally adapted training programmes were developed, and 25 organisations in all CE countries were trained in how to carry out CESBA assessments and to use the tool beyond the project. In the implementation process, the 'feasibility of certification' concept was analysed using a survey based on 132 interviews in 8 CE countries. Based on the eight national training programmes, 67 courses for experts, decision makers, students and the general public were held; overall, 1,714 people were trained within the project.

To achieve a bigger pool of knowledge, CEC5 cooperated with many other similar projects. Most importantly, cooperation with the 2007-2013 Alpine Space project Capitalizing Alpine Building Evaluation Experience (CABEE) allowed the creation of a common platform for gathering knowledge on the best practices in the field of high-quality ecological construction and energy-efficient solutions. Furthermore, a Joint Transnational Observatory of experts was created for all the interested parties to become acquainted with the project results and to seek more information on the new building culture. The Transnational Observatory described the structure behind CESBA and further developed and communicated its concept beyond EU projects from regional up to EU level.

The CEC5 project also built and rebuilt seven demonstration buildings, in order to showcase renewable energy sources and energy-efficient solutions as pilot examples. The buildings contributed to the mutual exchange of public decision makers, served as examples of assessment and represented lighthouse projects in good-construction processes.

Last but not least, the CEC5 project resulted in seven pilot investments in buildings in seven different CE countries, with a total investment volume of EUR 14.3 million. Since in five of those projects, the pilot investments via CEC5 were part of bigger energy-related interventions, it was possible on top of the CEC5 budget to leverage funds to the tune of around EUR 12.1 million (this is more than was initially projected).

3.5.9.3. Impact of the project

Policy and governance impacts

Historically, the CE territory has been – and to a large extent still is – characterised by a split between countries where concerns over the energy costs of buildings have been a policy issue for decades (the front-runners in this respect have been Austria and Slovenia) and those (formerly socialist) countries where energy costs were negligible and where there was a predominant culture of erecting mediocre buildings.

The CEC5 project, via its transnational nature, has succeeded in at least diminishing those historical differences by encouraging the transfer of awareness, knowledge and know-how with respect to low-energy buildings from more advanced countries to those lagging behind. In this process, the training of public officials from the countries lagging behind played a crucial role in the course of project implementation. It is no coincidence that the Lead Partner in the project (the Austrian Regional Development Agency in Vorarlberg) was from a CE country that is one of the more advanced in the area of energy savings and the use of renewable energy.

The main policy-oriented outcomes of the CEC5 project were as follows:

- The creation of a pool of knowledge as to the certification processes for low-emission buildings and passive public buildings;
- Elaboration of the CESBA tool, which is not only a methodology for assessing existing and new buildings, but also a framework for EU projects to reach greater convergence through a common process;
- Training and study courses on CESBA and energy-efficient building practices;
- Establishment of a transnational network to develop the ecological quality of constructions by offering certification services in the public sector.

Sustainability

The project partners at CEC5 are also the owners of certain outputs, such as demonstration buildings; this offers some guarantee of the project's sustainability. Also, the employees and users received CESBA training, and these skills have remained even after the project ended.

One important lasting legacy of the CEC5 project is that, via dissemination of knowledge and know-how, it has succeeded in changing for the better the attitude of public decision makers in the area of construction. One clear example of the project's success is the fact that, according to a general council decision, from now on new buildings in the city of Ludwigsburg should be constructed as 'nearly zero energy buildings'. In Italy, the recommendation has been that CESBA KIPs should also be adopted by the public assessment systems: Protocollo ITACA and CasaClima. After a CESBA conference, the state of Baden-Württemberg in Germany defined sustainability criteria that need to be fulfilled in order to get public funding when constructing a public school or sports building. Even in CE countries where awareness of the importance of CESBA standards in construction has been traditionally rather low (such as the Czech Republic and particularly Poland), this has attitude started to change, thanks to the CEC5 project; numerous training events, meetings and audits have contributed to this positive outcome.

The sustainability of the CEC5 project can also be seen in the investments that were not part of the project but that were indirectly related to it. For instance, in Austria (Vorarlberg), next to the CEC5 project building, a second building of the same kind (wood hybrid construction) has been constructed, with investments costs of around EUR 30 million. Similar projects were scheduled to be implemented in Germany as well.

Last, but not least, "*the CESBA initiative still exists and develops further*" (Peter Steurer, Regionalentwicklung Vorarlberg, for CESBA see https://www.cesba.eu/). The project also led to a series of other projects, like Interreg Alpine Space CESBA Alps (2015 – 2018) dealing with climate change and

spatial planning, the Interreg Mediterranean CESBA MED (2016 – 2019) focussing on climate change and city planning and the Interreg Alpine Space GREENCYCLE (2016 – 2019) project dealing with climate change and circular economy. Based on these projects the network of institutions supporting is constantly expanding (see http://wiki.cesba.eu/wiki/Main_Page).

Benefits to stakeholders, target groups, general public

The CEC5 project consortium consisted of energy experts, cities, regions and ministries, so that coordination over sectors could be assured. In a narrow territorial scope, the main target groups and beneficiaries of the CEC5 project have been locations, users and visitors to the demonstration buildings. In this way, they have been able to get in contact with innovative solutions on energy efficiency and the use of renewable energy, and this has improved their knowledge on the subject.

On a wider territorial dimension, the target groups of the project included service providers, enterprises and stakeholders in construction, who were trained in use of the CESBA generic assessment tool and gained knowledge through training and the model assessment of 24 buildings. The newly acquired skills allowed them to generate new and innovative solutions and gave them a back-up for implementation. Besides, the various workshops organised during the project implementation provided a wide range of stakeholders – such as SMEs, representatives of public authorities and students – with an opportunity to gain knowledge of CESBA in the participating regions.

The CESBA initiative could only succeed at the transnational level. The cross-country exchange in development of the 'CESBA Guide' and the generic assessment methodology, including the joint strategy, was a major benefit. The CESBA initiative combined CESBA experts representing each partner in the project, who served as ambassadors for the initiative and actively promoted it. Crucially, the success of the CESBA concept required coordination between projects (CEC5, CABEE) and funding programmes (CENTRAL EUROPE, Alpine Space), which allowed the synergies between individual initiatives to be utilised.

3.5.9.4. Summary assessment of the project's impact and benefits

With its budget of some EUR 4 million, the CEC5 project did a great job of promoting the low-energy standards of buildings across eight CE countries, increasing the awareness of policy makers and other stakeholders of the importance of energy savings and the use of renewable sources of energy in construction. The key output of the project was the elaboration of the Common European Sustainable Building Assessment (CESBA), which is a free-of-charge and easy-to-use tool to assess the energy performance of existing and new buildings and a vehicle to facilitate convergence within the EU. The project helped in the implementation of seven investment projects in seven CE countries, with a total investment volume of EUR 14.3 million, of which EUR 12.1 million was leveraged. Probably even more importantly, it laid the foundations for further investments following the above-mentioned pilot projects (e.g. in Austria and Germany) and contributed to a turnaround in attitudes to low-energy construction among the policy makers of less-advanced CE countries.

3.5.9.5. The CEC5 story

The aim: Fostering the construction of low-energy buildings in Central Europe

Historically, the CE territory has been characterised by a wide divergence among countries, as far as the importance of energy savings and the construction of low-energy buildings are concerned, with the former socialist countries clearly lagging behind. The idea behind the CEC5 project was to elaborate, in the process of transnational cooperation and exchange of experience, a single tool that would set the appropriate standards for low-energy buildings, and thus to foster their construction in the CE countries, with the ultimate aim of contributing to achievement of the EU 20/20/20 energy targets.

The challenge: To demonstrate energy efficiency and utilisation of renewable energy sources through public buildings

With a total budget of some EUR 4million (of which 81% was provided by the ERDF and the rest co-financed from national public sources), the CEC5 project lasted from October 2011 till December 2014. It sought to demonstrate energy efficiency and the utilisation of renewable energy sources in public buildings, and to kick-start investment in low-energy buildings across the CE countries.

It was set up by a transnational consortium of ministries, municipalities, energy and development agencies, regional authorities and a chamber of architects, and included 12 project partners from eight CE countries: Austria, the Czech Republic, Germany, Hungary, Italy, Poland, Slovenia and Slovakia.

The results: CESBA energy planning tool – free of charge and easy to use

"*We are all part of Europe, but we are different and will be different in future as well. It is hardly possible to achieve a common European solution in a project. But, when you got to know each other, you can find at least a common transnational path to progress. CESBA is the result of this progress.*" Peter Steurer, Regionalentwicklung Vorarlberg)

The project partners started with the joint transnational evaluation of assessment criteria for ecological public buildings and the development of a certification procedure. In this way, the project came up with a helpful tool to assess a building quality in the form of CESBA – Common European Sustainable Building Assessment, which recognises the benchmarks set by the 'nearly zero energy buildings' requirement stipulated by EU legislation. CESBA provides a systematisation of methods for the assessment of a public building during the entire cycle of its operation: from planning, design and construction through to its use and impact on the environment. To this end, it uses the best practices of existing methods of buildings certification, but also introduced its own criteria, taking the comfort of users as its priority.

The project resulted in seven investment projects in seven different CE countries, with a total investment volume of EUR 14.3 million. Since in five of those projects, the pilot investments via CEC5 were part of bigger energy-related interventions, it was possible on top of the CEC5 budget to leverage funds of around EUR 12.1 million (more than had been projected initially).

One important lasting legacy of the CEC5 project is that, via dissemination of knowledge and know-how, it has succeeded in changing for the better the attitude of public decision makers in the area of

construction. One example of the project's success is that new buildings in the city of Ludwigsburg should be constructed as 'nearly zero energy buildings'. Also, the state of Baden-Württemberg in Germany has defined sustainability criteria that need to be fulfilled in order to get public funding when constructing a public school or sports building. Even in CE countries where awareness of the importance of low-emission standards in construction has been traditionally rather low (such as the Czech Republic and Poland), this attitude has started to change, thanks to the CEC5 project; numerous training events, meetings and audits have contributed to this positive outcome.

Last, but not least, "the *CESBA initiative still exists and develops further*" (Peter Steurer, Regionalentwicklung Vorarlberg, for CESBA see: https://www.cesba.eu. The project also led to a series of other projects, like Interreg Alpine Space CESBA Alps (2015 – 2018) dealing with climate change and spatial planning, the Interreg Mediterranean CESBA MED (2016 – 2019) focussing on climate change and city planning and the Interreg Alpine Space GREENCYCLE (2016 – 2019) project dealing with climate change and circular economy. Based on these projects the network of institutions supporting is constantly expanding (see http://wiki.cesba.eu/wiki/Main_Page).

3.5.10. From Industrial Use to Creative Impulse – SECOND CHANCE

3.5.10.1. Aims of the project

SECOND CHANCE was a CE TNC project for the period 2010-2013. In general, the project addressed the challenge of globalisation and the associated worldwide transformation from manufacturing-based to service-based economies. The closure of manufacturing companies has resulted in brownfield areas, especially in urban areas. The revitalisation of these areas provides opportunities for improving the quality of urban spaces. In the project, partners jointly developed concepts and strategies for the transformation of such places. The project thus aimed to identify innovative approaches, examined the adequacy of art and culture activities for revitalisation, and constructed public–private partnerships that allowed an economically sustainable utilisation. Thus, the project's ultimate goal was to enhance the attractiveness of urban areas by creating lively cultural locations.

SECOND CHANCE consisted of 10 partners from five European cities (Nuremberg, Leipzig, Venice, Kraków and Ljubljana). The project leaders were the local authorities of the city of Nuremberg. While Nuremberg implemented a typical PPP structure, the partnerships in the other cities were constructed between local municipalities and other public bodies. These comprised museums and institutions specialising in regional development and planning.

The project received total funding of EUR 2.8 million (78% from ERDF, 18% from public co-financing and 3% from private co-financing). The project was defined by six work packages (WPs). WP1 and WP2 dealt with organisation and communication activities, while WP3, WP4 and WP5 aimed to identify potential solutions for revitalisation and demonstrated the potential for partnerships between private and public entities. WP6 guaranteed a sustainable impact and promoted follow-up projects.

In detail, WP3 aimed to develop innovative approaches for revitalisation, which were then transferred into location-specific utilisation concepts. Good practices were explored and identified in advance. WP4 focused on the first implementations of the created concepts by conducting pilot projects. This package also involved pre-investment actions, including consultations with local experts. Moreover, feasibility studies were planned. WP5 then dealt with the implementation of PPPs. This work included intensive dialogues with local stakeholders and the definition of a PPP concept that provided a toolbox. Finally, WP6 focused on transnational marketing activities in order to enhance awareness of revitalisation possibilities. Furthermore, it should create potentials for attracting private investors.

3.5.10.2. Output and results

SECOND CHANCE produced a number of outputs and results. The project partners defined a strategic document, developed a new tool, prepared investment plans and conducted five pilot actions. Overall, SECOND CHANCE increased the quality of life in the five participating cities, which had an impact on the total number of inhabitants of the cities (in total: 2,315,000). Moreover, the project promoted the potential for revitalisation possibilities and enhanced general awareness in this respect.

In detail, the output and results were as follows.

Action plans/implemented strategy: Transnational PPP concept: this concept formed the main strategic document that enabled the definition of location-specific PPP models and the creation of transnational standards for partnerships. In this regard, the project partners conducted five SWOT analyses, created five development visions and five utilisation concepts, and defined five specific PPP plans.

Tools developed: Transnational marketing study: the marketing programme promoted the possibilities for brownfields to encourage private investors and sponsors. It further presented additional potentials for all project partners, in order to enhance the visibility of the project network. The marketing programme also supported the sustainable development of the five locations after the project period.

Investment plans prepared: Pre-investment actions: investment preparation activities included intensive consultations with local experts, talks with local authorities and location-specific feasibility studies. Each city clarified whether permission for investments was available and plans were in line with municipality concepts.

Pilot actions: Investment in the revitalisation of brownfields: SECOND CHANCE invested in pilot actions in the five cities. The total investment volume amounted to EUR 860 thousand. This budget allowed for the renovation, restoration and equipping of the five sites. In addition, project partners and the location-specific management promoted additional private and public funding. This allowed leveraging additional investments of approximately EUR 17 million in the years after the project period.

3.5.10.3. Impact of the project

Policy and governance impacts

The results of the project work were presented to local politicians. This influenced the policy in the field of industrial revitalisation and stimulated further activities in the participating cities. In Nuremberg and Ljubljana, plans for further renovation and revitalisation activities were drawn up. This also included new ways of funding (PPPs and European Funding).

Moreover, the marketing programme also promoted the awareness of revitalisation possibilities in other urban areas in the CE territory. Revitalisation provides the possibility of enhancing a location's attractiveness, which in turn might mitigate the movement of inhabitants to other locations.

Sustainability

The project SECOND CHANCE was conceived sustainably. The project aimed to create possibilities for innovative and sustainable revitalisation activities. The PPP organisation guaranteed a structured partnership and therefore sustainability in the cooperation. SECOND CHANCE was further characterised by an institutional and financial sustainability in all participating cities, at least for a certain period of time.

The project‘s locations serve as role-models for other cities. For this a number of dissemination tools (moving exhibition, project homepage, and two brochures) were produced, ensuring the long-term availability of the gained knowledge.

Institutional and financial sustainability was envisaged for all participating cities. Thus, the city of Nuremberg undertook further investments beyond the initial pilot action (see below), while in Ljubljana the cultural department of the City of Ljubljana as well as local partners and sponsors ensure the financial future of the pilot investments. In Leipzig the sustainable use of the pilot action, the eleven studios, is guaranteed at least until 31.12.2024 as the 'Leipziger Baumwollspinnerei' is committed to the future use the studios for artistic and cultural purposes. In Krakow the pilot investment is sustainable in political, financial and functional terms, due to commitments from the Museum of Municipal Engineering[335] and the municipality of Krakow. In Venice the restored Torre di Porta Nuova was destined to become an exhibition and performance space together with a space for research devoted to the study of the scientific, historical and artistic heritage of the Arsenale. In May 2013, the entire Northern area of the Arsenale property was transferred from the State to the City. Its current use is unclear, though.[336]

Stimulation of investment or initiatives

The project partners initiated a follow-up project. This new project aimed to intensify marketing activities at the local, national and international level, and to approach neighbouring communities around the participating cities' locations.

Furthermore, the project encouraged additional investments. The project partners attracted private and public funding for additional investments of approximately EUR 17 million in the years after the project that is around 6 times the allocated funds to the project. The investments leveraged by SECOND CHANCE included the purchase of one building (4,400 m² of useable space) by the City of Nuremberg and developing it into the 'Kulturwerkstatt'[337]. In Ljubljana the pilot investment RogLab[338] was further supported by the Ministry of Culture of Slovenia and the Museums of Ljubljana. In Krakow at least EUR 1 million was invested into a building within the Quarter of St. Lawrence, due to an increase of the yearly grants received by the Museum of Municipal Engineering in Krakow form the municipality.

Benefits to stakeholders, target groups, general public

The main beneficiaries of SECOND CHANCE were local public authorities, site managers, cultural institutions, citizens and other stakeholders in the participating cities.

Local managers benefited directly by getting external support for the revitalisation activities. Local authorities were involved in the project's events and participated in discussions on development of the sites. Furthermore, cultural institutions and companies collaborated with project partners in design, vision and concept. They further benefited directly from cultural exchange and from having access to new opportunities. The public benefited from sustainable concepts for the utilisation of brownfield areas, the improved quality of the locations, and thus their attractiveness as well as their competitiveness.

[335] http://www.mim.krakow.pl/en
[336] Based on internet research (http://arsenale.comune.venezia.it/?location=torre-di-porta-nuova) and an Interview with Thomas Müller of the City of Nuremberg.
[337] See https://kuf-kultur.nuernberg.de/weitere-kuf-einrichtungen/kulturwerkstatt-auf-aeg/veranstaltungen/
[338] http://www.roglab.si/en

As a 'by-product' of the SECOND CHANCE cooperation other forms of cooperation were established between the partnering cities, e.g. a cooperation of the Museum Krakow and Nuremberg regarding historic trams etc.[339]

"*The biggest success, in my view, was that the idea behind the project proved to be correct. The conversion of industrial brownfields can work well and is positively influenced by art and culture. The crucial factor in Nuremberg was that both a private partner (MIB Colored Fields GmbH) and a public partner (City of Nuremberg) pursued and implemented this goal together. The project positively supported the public's perception of the site and encouraged follow up investments on a large scale. The pilot investment made it possible to try out cultural forms that could be taken into account in the design of the cultural center "Kulturwerkstatt Auf AEG", which has become firmly established*" (Thomas Müller, City of Nuremberg)

3.5.10.4. Summary assessment of the project's impact and benefits

The project SECOND CHANCE aimed to provide concepts to revitalise brownfield areas through cultural activities in urban regions by setting up sustainable PPPs. These concepts were first of all implemented via pilot actions in five CE cities. A common transnational marketing study enhanced awareness of revitalisation possibilities and ensured the project's visibility. These common activities induced both public and private funding for additional investments. Partnerships between local stakeholders and stakeholders from different locations established a network for sustainable collaboration. Moreover, the pilot actions also constituted benchmark examples for revitalisation processes in other cities.

3.5.10.5. The SECOND CHANCE story

The aim: Enhancing the attractiveness of urban areas by setting up sustainable partnerships

Five European cities – Nuremberg, Leipzig, Venice, Kraków and Ljubljana collaborated to develop sustainable concepts for the revitalisation of brownfield areas through the integration and promotion of cultural activities and thus gave city locations a second chance. Project partners worked together on innovative approaches and defined possibilities for art and culture activities. To guarantee sustainability in the areas of the participating cities, local municipalities entered into cooperation with other partners. In Nuremberg, the city collaborated with a private partner, while in the other cities the local authorities cooperated with other public institutions.

The challenge: Defining sustainable solutions and attracting further funding

The 10 project partners worked together to create concepts for the utilisation of brownfield areas in sustainable ways. The main challenge was thus to involve other private and public parties in a strong partnership structure, and further to activate additional funding sources in order to guarantee a sustainable management of the sites after the project's duration.

The results: Cultural impulses and long-run transnational partnership

[339] Information based on the interview with Thomas Müller, City of Nuremberg.

Pilot investments in brownfield revitalisation of sites in the five cities created lively cultural locations. This allowed the quality of life in the locations – and subsequently their attractiveness and competitiveness – to be improved. Moreover, transnational cooperation via city partnerships induced an exchange between different cultures and created new impulses. Moreover, marketing activities promoted further potentials for the project partners and improved the visibility of the project network.

The publicity created by the SECOND CHANCE pilot actions was crucial to generate political buy-in. As policy makers became aware of the value-added generated by the pilot actions, "*the project itself received greater attention making it possible to access new funding resources*" (Thomas Müller, City of Nuremberg). Hence, additional private and public funding allowed further investments and expansion of the project's sites. In total SECOND CHANCE leveraged at least EUR 17 million of public funding in the years after the project, that is, around 6 times the allocated funds to the project. The investments leveraged by SECOND CHANCE included the purchase of one building 4,400 m² of useable space) by the City of Nuremberg and developing it into the 'Kulturwerkstatt' . In Ljubljana the pilot investment RogLab was further supported by the Ministry of Culture of Slovenia and the Museums of Ljubljana. In Krakow at least EUR 1 million was invested into a building within the Quarter of St. Lawrence, due to an increase of the yearly grants received by the Museum of Municipal Engineering in Krakow form the municipality.

A further key result of the project was the development of a transnational PPP concept that acted as a toolbox for PPP models. Based on the concept, sustainable location-specific PPP models were developed for each pilot action.

Finally, SECOND CHANCE constituted best-practice examples of the possibilities for revitalisation and for its implementation. The project increased awareness of revitalisation potentials among local stakeholders and potential partners from other European cities.

"*The results of SECOND CHANCE contributed to a balanced, attractive and competition-promoting urban development. It created jobs in the city, upgraded a neighbourhood and gave it a new perspective. This good example also radiates into the region and can encourage cities in other European countries to revitalize brownfields with the help of art and culture giving them a second chance*." (Thomas Müller, City of Nuremberg)

3.5.11. Manager Coordinating Brownfield Redevelopment Activities – COBRA MAN

3.5.11.1. Aims of the project

COBRA MAN assisted municipalities in managing and rehabilitating post-industrial sites. The project provided technical assistance and elaborated a number of recommendations on organisational positioning of the brownfield manager and the profiling of the role as a profession. Furthermore, the project's contribution to capacity building and educational courses in major Central Europe cities proved that such transnational cooperation is supportive of territorial cohesion, urban developments and restructuring of post-industrial areas.

The COBRA MAN consortium was led by the city of Bydgoszcz (Poland). COBRA MAN included nine partners from six CE countries (two Polish partners, three partners from the Czech Republic, two from Slovenia and one each from Germany and Italy). The project brought forward the EUBRA (European Brownfield Revitalisation Agenda) initiated by the Interreg IIIB projects REVIT and PROSIDE, which has dealt in the past with brownfield regeneration processes. The cities of Bydgoszcz, Milan and Stuttgart brought together and represented the concerns of a number of European municipalities, regional/national development and environmental agencies, consultants and other stakeholders. COBRA MAN was designed to promote the quality of life and of the environment in urban areas, foster a more balanced urban development of cities and regions, and create the setting for further concrete investment. COBRA MAN established close cooperation with other projects, such as ReSOURCE, REURIS and URBAN-SMS of the CE 2007-2013 Programme as well as further Interreg and FP7 projects (e.g. HOMBRE, TIMBRE).

COBRA MAN received total funding of EUR 3.6 million (82% from the ERDF, 16% from public co-financing and 2% from private co-financing). The project was organised in six work packages (WPs). WP1 dealt with the coordination and management of administrative, legal and financial issues of the project. WP2 oversaw communication, knowledge management and the dissemination of project outputs and results. WP3 was responsible for the knowledge base and decision support – specifically, its task was to bring together, exploit and evaluate the existing project results concerning 'sustainable brownfield regeneration' achieved in the past by EU-funded projects from FP5&6 and Interreg. WP4's main objective was capacity building, the development of tools for the brownfield manager and construction of 'brownfield manager' professional profile. In particular, this WP had the task of developing an organisational framework and a comprehensive training programme for the staff responsible for brownfield management in the municipalities. The implementation phase of the project was carried forward at the local level with a pilot application in WP5 and was supported by WP6 via the European School of Brownfield Redevelopment.

3.5.11.2. Output and results

The project's work resulted in a number of essential outputs. They included the development of two transnational tools and three pilot actions including investments. The project also contributed to the creation of training and educational schemes. The project contributed further by bringing forward and extending transnational cooperation between the stakeholder and those agencies, academics and

practitioners from the project partners involved and sharing best practice among the partners in a European Framework. More specifically, the project managed to fulfil such objectives as: drafting a detailed professional profile for the profession of brownfield manager; providing the structure for the knowledge base and management of outputs, including of brownfield regeneration projects in the past; offering training for practitioners of 'brownfield regeneration' in the partner cities involved through e-learning and on-site learning. The project led to more strategic economic and social development at the local and regional level of the partner cities and respective regions. As a result, more than 1.3 million inhabitants benefited from enhancement of the quality of urban environment, public spaces in the cities and rehabilitation of urban and peri-urban functional sites. Most importantly, COBRA MAN helped bring in further investment of approximately EUR 171 million for the rehabilitation of urban and peri-urban functional sites for the period 2014-2020.

In more detail, the outputs are:

a) Brownfield manager professional profile – a transnational tool which was established for providing a comprehensive job profile for the regeneration manager, to be applied in Europe. Such a tool facilitated the design of verified methods, their application and the sharing of best practice in a European Framework. Accordingly, certified trainees have been hired within the city administrations of the project partners, thus guaranteeing implementation of the strategic approach of brownfield managers in these organisations.
b) The European School for Brownfield Management is a transnational tool developed by all partners in the consortium. Study courses and e-learning in English were accredited for six years, thus contributing to the standardisation of Central European educational systems for brownfield management. Pilot courses were organised in advance in Ostrava (Czech Republic) and e-learning in Bydgoszcz. Also a number of training events were offered in advance, such as: eight brownfield training course, two cycles of master seminars, one postgraduate study course and one e-learning course. "*In Ostrava, the pilot course led to a regular brownfield manager master course, postgraduate course and e-learning offer.*" (Hanna Lewandowska, City of Bydgoszcz [340])

Pilot actions including investments:

- Pilot action in Migliaro (Italy) – COBRA MAN contributed EUR 380,000 to the removal of waste following a prefeasibility study and technical survey of removal and waste disposal procedures and costs. This commitment was successfully concluded and EUR 2.6 million were allocated to redevelopment of the site.
- Pilot action in Most lake site (Poland): the project came up with a proposal for how to transform the area for short-term recreation, sport and housing, supported by the construction of a number of roads, utilities, beaches, marinas, trails and park – Centre of Old Most. The estimated cost of this transformation is put at around EUR 30 million, and the planned investment will be carried out by the city of Most with the support of ESI funds.
- Pilot action in Kranj (Slovenia): COBRA MAN contributed to the opening of an information centre in the run-down area of Kranj railway station with the purpose of increasing public awareness, attracting investors, providing a knowledge base on the redevelopment process and establishing a cooperation network between stakeholders. The Kranj information centre was a

[340]. See also the course description: https://www.vsb.cz/en/ects/course-units/hgf/?brancheId=1471

start-up project which leveraged other funding and aimed to attract further private investors. COBRA MAN contributed with an innovative spatial planning document, which provides a framework for the redevelopment of the area. According to the Sustainable Development Strategy of the municipality, the estimated cost of the area's regeneration will be EUR 81 million in the period 2014-2020, to be co-financed privately and via EU cohesion funds.

- Pilot action in Stuttgart (Germany): the concept of brownfield manager and other tools helped trigger a number of pilot activities and investments in this area. The brownfield managers proved effective and contributed to the implementation of a SWOT analysis to assess the contamination of Quellenstrasse, designed a development strategy, raised awareness and initiated a marketing campaign.

3.5.11.3. Impact of the project

Policy and governance impacts

COBRA MAN has contributed significantly to the stimulation of urban development policies at various local and regional levels, with the aim of rehabilitating run-down urban areas and lands. In particular, the impact of the project has been visible at the local and regional level, where a number of pilot projects and interventions, regional and transnational cooperation have been established. The outputs of the project have been used as cornerstones for brownfield strategies by the municipalities of Bydgoszcz, Stuttgart, Most, Kranj, Ústí nad Labem and Ferrara.

COBRA MAN has provided valuable inputs and development concepts, which can trigger and support large investments for the rehabilitation and transformation of brownfield sites into recreational areas. It has also contributed to encouraging further large-scale investment in an old and dilapidated train station (Kranj), as well as industrial and traditional mining areas (in Stuttgart and Ostrava).

In addition, COBRA MAN has demonstrated that knowledge improvement, training and the involvement of brownfield managers in a harmonised way across CE can contribute effectively to addressing the needs of cities for brownfields, to eliminating and transforming such areas into important recreation and to triggering further investment and jobs.

On the governance side, the brownfield managers trained by COBRA MAN have become part of the staff of city administrations in the municipalities of Bydgoszcz (Poland), Stuttgart (Germany), Most (Poland), Kranj (Slovenia), Ústí nad Labem (Czech Republic) and Ferrara (Italy), creating at least eight jobs during the lifetime of the project.

Finally, the European School for Brownfield Management, a transnational tool developed by COBRA MAN, has been integrated into the courses taught at Ostrava University and has been accredited for six years in Czech and English to set up training and promote educational activities in the area of brownfield and redevelopment (see above).

Sustainability

The long-run financial sustainability of the project has been assured first by its success in integrating the profile of 'brownfield manager' into municipal administrations, and secondly by the establishment of the European School for Brownfield Management as part of the educational curriculum at a number of universities of the project partner countries.

The project has been successful in triggering further investments in brownfields – e.g. demolition, waste removal, purchase of the site by private investors, transformation of the areas for recreation or sporting activities, redevelopment of housing units, commercial and industrial spaces – to the tune of almost EUR 171 million.

The working groups established among stakeholders at the local level will continue to operate. Cooperation has also been preserved among academics, who have submitted a number of publications for dissemination.

Benefits to stakeholders, target groups, general public

The main beneficiaries of COBRA MAN have been first the municipalities that were part of the consortium and that have to deal with polluted water/soil, run-down industrial areas and hazardous environmental conditions; and secondly, the inhabitants living in these and neighbouring areas, whose well-being has been safeguarded by the project.

In particular, municipalities and regional authorities have benefited from the professional input to strategic planning for brownfield management; a number of local players, businesses and research or development institutions have benefited from different forms of cooperation, transformation and investment opportunities for redevelopment of brownfields; and universities and a number of students have benefited from the capacity building, training and educational courses in this specific area. The municipalities of Bydgoszcz (Poland), Stuttgart (Germany), Most (Poland), Kranj (Slovenia), Ústí nad Labem (Czech Republic) and Ferrara (Italy) have benefited not only from the direct interventions in their run-down sites, but also from the training of staff for brownfield management in these municipalities.

Those who have benefited most are the inhabitants of the towns and neighbouring areas (estimated at around 1.3 million people), the students (more than 200 undergraduates and 30 postgraduates) who attended the courses and graduated from the universities that organised the courses, the more than 30 practitioners who received a professional certificate of brownfield manager, and transnational professionals. The latter group in particular benefited via the cooperation and exchange of experience that COBRA MAN established with other thematically related projects within the CE 2007-2013 Programme, such as RESOURCE, REURIS and URBAN-SMS, as well as other Interreg and FP7 projects (e.g. HOMBRE, TIMBRE).

Some concrete examples of benefits include the EUR 171 million of public/private funds leveraged in this framework for the development of commercial and industrial spaces in the Schoch-Areal (Stuttgart); rebuilding of the Centre of Old Most, etc.

Finally, the project had a tangible impact not only on the environment, but also on the design of management tools capable of influencing the strategic planning and development of post-industrial areas in a number of municipalities of Central Europe.

3.5.11.4. Summary assessment of the project's impact and benefits

With a total budget of around EUR 3.6 million (82% from the ERDF, 16% from public co-financing and 2% from private co-financing) the COBRA MAN project managed to contribute to the revitalisation of a number of brownfield sites in six different countries, safeguarding the well-being of 1.3 million inhabitants living next to post-industrial and polluted areas. A volume of EUR 171 million of public/private funding was leveraged for the further redevelopment of new commercial, industrial and recreation spaces in the rehabilitated sites via the COBRA MAN project. Therefore, the project was very successful in its intention of ensuring sustainability in the long run.

3.5.11.5. The COBRA MAN story

The aim: Rebuilding brownfield sites

Because of the great importance that the rehabilitation of brownfield sites has for the social and territorial cohesion and prosperity of the areas involved, the COBRA MAN project engaged nine partners from six CE countries – Bydoszcz (Poland), Stuttgart (Germany), Most (Poland), Kranj (Slovenia), Ústí nad Labem (Czech Republic) and Ferrara (Italy). The project was an initiative which brought forward the EUBRA (European Brownfield Revitalisation Agenda) and assisted a number of municipalities with technical support in brownfield management, promotion of quality of life and well-being in urban areas, redevelopment of cities and design of brownfield strategies and leveraging of funds in this area. Close cooperation was established not only with the partner institutions involved, but also with other Interreg projects, with the purpose of exchanging experience and offering further support in implementation of the project.

The challenge: Setting a uniform platform for brownfield revitalisation and leveraging large investments

COBRA MAN received total funding of EUR 3.6 million (82% from the ERDF, 16% from public co-financing and 2% from private co-financing). COBRA MAN focused on providing professional staff and guidance to municipalities in effectively managing and regenerating brownfield sites. Setting uniform standards for brownfield management was one of the main challenges, because the municipalities lacked adequate structures for doing so. COBRA MAN followed a bottom-up approach to establishing such structures and integrating the profile of brownfield manager in the organisation chart of the respective municipalities.

The results: Standardisation of the brownfield manager professional profile and education schemes in the field

"*The main success was the introduction of the new position 'Brownfield manager' and the elaboration of a new educational offer: Brownfield manager master course, postgraduate course and e-learning at the*

University of Ostrava. Although everyone sees the need for this profession on the labour market, public institutions are slow to introduce changes. It is a great result of COBRAMAN to employ a brownfield manager in City of Stuttgart. Through the master course in brownfield management in Ostrava many students gain the necessary knowledge." (Hanna Lewandowska, City of Bydgoszcz)

It proved very useful in social, economic and environmental terms to create a professional profile for brownfield managers, to prepare education courses on brownfield management to be offered at universities and to offer highly qualified technical support and expertise on the strengths, weaknesses, opportunities and threats for cities affected by brownfields.

Based on the brownfield manager professional profile created by COBRA MAN, six municipalities were equipped with staff qualified to manage brownfield sites. Meanwhile, universities benefited from the educational scheme, the European School for Brownfield Management, provided by the project.

COBRA MAN provided valuable technical support in leveraging further large investments in the rehabilitation of post-industrial areas, such as in the city of Stuttgart (where the Quellenstrasse and Schoch-Areal site saw the development of 120 housing units, commercial and industrial spaces and kindergartens), the transformation of the old city of Most or the revitalisation of Kranj old train station.

3.5.12. New post-socialist city: Competitive and attractive – ReNewTown

3.5.12.1. Aims of the project

ReNewTown aimed to support the revitalisation of post-socialist urban centres, via pilot projects and the collection and dissemination of best-practice examples from the last 20 years, for the use of the general public, academia and local government.

Led by the Polish Academy of Sciences, Stanisław Leszczycki Institute of Geography and Spatial Organisation, the project included partners from five countries: Slovenia, the Czech Republic, Slovakia, Germany and Poland. The project sought to pool the expertise and perspectives of partners from these different fields. A transnational approach was taken in order to achieve knowledge transfer between different countries, and to deepen the relationship between countries in the region.

An improvement in living conditions in formerly socialist urban areas was sought in six ways:

- Improving the social and cultural offering available to locals;
- Finding ways to improve public spaces between blocks of flats;
- Creating a model for entrepreneurial development;
- Finding ways to make socialist architecture more visually appealing;
- Identifying means to help local communities identify more strongly and positively with their place of residence;
- Ideas for new and more modern functions for public buildings constructed during the socialist period.

As part of the project, work was carried out to identify the impacts of political, social and demographic change. The Transnational Development Strategy, in particular, sought to address the following problems:

- A shortage of space for (and lack of) cultural and social events;
- Poor condition and quality of buildings;
- Low quality of public spaces between blocks of flats;
- Unemployment and a lack of local employment;
- The soulless appearance of much socialist-era architecture;
- Lack of identification with or attachment to the area on the part of many residents;
- Lack of sense of community;
- Widespread view that more modern functions could not be found for old socialist-era buildings.

The project received a total of EUR 1.25 million in funding (84% from the ERDF and 16% from public co-financing).

3.5.12.2. Output and results

The outputs of the project can be generally split into two main areas: pilot projects and a series of reports, databases and other tools to be used by policy makers and the general public.

Four pilot projects were successfully implemented. In all cases, a 'bottom-up' approach was taken, with a focus on the involvement of local citizens, both in the initial development phase and in the formulation of a framework for evaluating the results. As part of these, new cooperation was achieved between municipalities and citizens, volunteerism was promoted, the urban and cultural heritage was revitalised, and new spaces for community activities were created.

- In **Kraków**, Poland, the ArtZONA project[341] involved the adaptation of a building to function as a gallery, meeting places for artists, performance space and a location for trade fairs for local entrepreneurs. The project was targeted specifically at the local community in Nowa Huta (a socialist-realist suburb of Kraków with around 220,000 residents), NGOs, artists and entrepreneurs. ArtZONA has received several awards for projects that focused on children, and was involved in the Local Regeneration Programme for Nowa Huta.
- In **Velenje**, Slovenia, a public space between apartment blocks was converted into a multifunctional facility for local people of different generations. This included planting trees and installing exercise equipment and a children's playground. Volunteers contributed a total of 1,567 hours of work to achieve the results, and 4,382 local inhabitants benefit from the project.
- In **Hnúšťa**, Slovakia, a socialist-era building (around 500 square metres) was transformed into a Museum of Socialist Curiosities. The museum has 600 artefacts and is targeted at local citizens, schools, the media, activists and volunteers. The project organised 10 public workshops, out of which working groups were formed. These working groups now run the museum on a voluntary basis.
- In **Prague 11**, a district of the Czech capital, the Centre for SMEs was created to provide support to local entrepreneurs. The district has suffered from high unemployment and a lack of commercial activity.

In addition to the pilot projects, a host of reports, databases and other tools were produced. Research was conducted in Chomutov and Ústí nad Labem in the Czech Republic, Cottbus and Karlsruhe in Germany, Warsaw and Kraków in Poland, Hnúšťa and Rimavská Sobota in Slovakia, and Nova Gorica and Velenje in Slovenia.

The project produced a so-called 'market research report', which built on studies in all five countries. This included a statistical overview and interviews with policy makers, town planners, entrepreneurs and other stakeholders. A tool was created to conduct research on the functions of public buildings in urban areas before 1989 and plans for their future. The 'scope of market research' tool included questionnaires, which were used in all five countries included in the project (including residents, entrepreneurs and experts).

In addition, a 'good practice report' was produced, collecting together 61 examples of relevant good practice. Aside from the five countries directly involved in the project, examples of good practice were

[341] Funds for this project were provided by the Polish Ministry of Culture and National Heritage Grant Programme, Municipality of Kraków, Nowa Hu.ta District Council, National Cultural Centre.

also collected from Estonia, Bulgaria, Hungary, Latvia, Ukraine, Romania and Lithuania. These examples included assessments of their impact and possible transferability to other locations.

Three databases were also created. These focused on good practices, initiatives and experts (37 of the latter were involved). Knowledge transfer was achieved both between the partner countries/municipalities and to academia, policy makers and the general public more widely.

The project also produced a transnational manual for urban revitalisation, entitled 'ENGAGE: Brighter Future in Your Hands'. This was produced on the basis of the market research and good-practice reports, and took into account the results of public consultations in all five countries. It included advice on how to plan and implement urban renewal projects. This outlined a strategy for change, with the aim of shaping post-socialist cities as attractive places in which to live.

A Handbook of Models was also developed, entitled *Post-Socialist City: A Role Model for Urban Revitalisation in the 21st Century*. This book used knowledge gained during the project. An overview of issues facing post-socialist cities in Central and Eastern Europe was provided, including a case study of Slovenia, looking at how the attitudes of locals affect urban development, demographic and business trends, and how social capital, values and happiness are affected by living in such urban environments. Twelve model approaches were identified to improve life in post-socialist urban environments, and the book included examples of how these models worked when implemented in the five countries.

Finally, a series of seminars was organised to achieve an exchange of experiences and to promote good-practice examples (including online databases and the Handbook of Models). This allowed information to be disseminated, feedback to be obtained from interested parties and new opportunities for collaboration after the end of the project to be identified.

3.5.12.3. Impact of the project

Policy and governance impacts

As already detailed, the project produced extensive databases and publications listing examples of good practice and practical ways to regenerate post-socialist urban areas for the benefit of citizens. These helped to stimulate and facilitate the exchange of information within and between regions and countries. The results influenced policy makers at the municipal, regional and national levels in Central European countries.

Via publications, the results of the project were also disseminated among the international research community interested in urban regeneration, providing an important input for studies in this area. The project results were used by researchers at the national level in Germany (Karlsruhe Institute of Technology), Slovenia (University of Ljubljana), Poland (Polish Academy of Sciences) and Croatia (Institute of Economics, Zagreb).

The pilot projects often had tangible policy outcomes, even if sometime they were not planned initially. "*Thus, the positive impact of the volunteer work in the Velenje pilot action made such an impact on policy makers and the population that it was re-invoked to on other occasions, like for the protection of*

the environment". (Magdalena Wątorska-Dec, Polish Academy of Sciences). Volunteers were engaged to prevent flooding and to clear trees and bushes from the banks of the river Paka. They included civil protection members, volunteer firefighters, fisherman, hunters and local government employees. These activities were supervised by the Slovenian National Agency for the Environment (which had previously been unable to clear the river banks due to budget cuts). The local government then repeated these actions in subsequent years.

Three local governments in Slovenia used the Handbook of Models to help prepare their municipal development strategies up to 2020. Via the results of the project, local governments were able to gain a better understanding of how people living in post-socialist urban spaces see urban development, demographic and business trends, and to achieve an insight into social capital, social responsibility, values and life satisfaction in these places. Around 81,000 citizens benefited from this initiative. Wider dissemination of the results of the Velenje pilot project was achieved when Slovene President Danilo Türk attended the opening ceremony. Meanwhile the ArtZONA project received additional funds in 2013 and 2014 for the renovation and modernisation of its building.

Sustainability

Some of the pilot projects have developed into lasting institutions that will improve the quality of life for local citizens. These examples, combined with the written materials and databases, have created a basis for local communities to take action to improve the quality of life of people living in post-socialist areas.

In the case of ARTzona, the ReNewTown local coordinator participated in a six-month international training course on strategic management in cultural institutions. This was organised by the Polish National Culture Centre and the Belgian Association Marcel Hicter. As well as the local coordinator's improved qualifications, this produced a strategy document for the further development of ARTzona. This document outlined the main objectives for ARTzona's development after the end of the pilot project, including in terms of improving the venue's human resources.

Furthermore," *after the completion of the ReNewTown project, the ARTzona team continued their work related to the renewal of space and managed to convince local authorities (i.e. the City of Krakow) and national authorities (the Ministry of Culture and National Heritage) to further support ARTzona. Over the last five years, ARTzona has obtained enough financial resources that allowed the team to carry out further renovation works and to buy the full equipment for it. Thus, through the seed funding provided in the ReNewTown project ARTzona has become a cultural institution meeting the standards of the 21st century*". (Małgorzata Hajto, Artistic manager - ARTzona Cultural Center)

In Hnúšťa, the museum is now run on a voluntary basis, and continues to receive donations from local people for exhibitions (600 artefacts in total). It has provided a valuable means for younger people to learn about the lives of their parents and grandparents under communism. Meanwhile in Velenje, the pilot project developed into annual civic efforts to clear the river banks under the guidance of the local government. Three local governments in Slovenia used the Handbook of Models to inform policy.

Job creation is a further key indicator of the sustainability of projects. In both ARTzona and Prague 11, two jobs were initially created as a result of the pilot projects. In the meantime, because of "ARTzona

success employment has been increased to 5 to 6 people". (Magdalena Wątorska-Dec, Polish Academy of Sciences) In each project, the activities being performed required permanent and well-trained staff. In both Hnúšťa and Velenje, work was carried out by volunteers. However, after the end of the pilot, one part-time job was created in Hnúšťa, while two volunteers chose to carry on their cooperation with the museum on a permanent basis.

Other effects

An important additional, unplanned effect of ReNewTown mentioned by project participants, was the opportunity to develop the personal potentials. "*I believe the main success [of ReNewTown] was the development of people's competences and talents that could be used for further development of local communities*". (Magdalena Wątorska-Dec, Polish Academy of Sciences)

ArtZona pilot action from Krakow could serve as a perfect illustration. It is and excellent example as seed money from Central Europe Programme through the ReNewTown project were wisely invested both in human capital and infrastructure. The funds enabled to create a great team that was determined to gain new skills, knowledge, organize events for local communities and engage in new projects concentrated on culture. It was a basis point to arrange financing for further development of the offer and what was highly important for refurbishment of the buidling (additional 200.000 Euro from national programmes). This was possible thanks to ReNewTown project because the team proved to be successful in gaining external funding and experiment with the cultural programme. It would not be possible without money.'

Likewise Ms. Hajto wrote that, 'the positive unplanned effect of the ReNewTown project and especially the ARTzona pilot action implementation from our perspective is the recognition of our team members as experts in creating artistic spaces, raising funds for renewal activities and efficient implementers and partners of social and cultural projects. Thanks to that, we have started a permanent cooperation with Krakow Universities educating students in the field of art and culture management. We receive invitations to participate as experts in conferences, trainings and events dedicated to the cultural development and urban renewal.'

3.5.12.4. Summary assessment of the project's impacts and benefits

ReNewTown fulfilled its aims and contributed to a significant upgrading of data and best-practice examples on improving the quality of life of people living in post-socialist urban areas in Central and Eastern Europe. The project produced quantitative and qualitative materials, which have informed policy at the local level, and have served as an input into related research at the national level in several countries. In several cases, pilot projects have developed into sustainable initiatives, creating jobs and contributing to the local area.

3.5.12.5. The ReNewTown story

The aim: Improving quality of life in post-socialist cities

The ReNewTown project set out with the aim of finding new ways to improve the lives of people living in post-socialist urban spaces in Central and Eastern Europe. Noting issues such as urban decay, a lack of consideration of residents' needs in original planning strategies, and a lack of cultural stimulation in many post-socialist urban districts in the region, the project sought to involve local citizens in a bottom-up approach, in order to achieve tangible and sustainable results.

The challenge: Tackling innovation and entrepreneurship at a transnational level

The project involved cooperation between five countries in Central and Eastern Europe, and research and collection of best-practice examples in a number of others. A transnational approach was taken in order to achieve knowledge transfer between different countries, and to deepen the relationship between countries in the region. An improvement in living conditions in formerly socialist urban areas was sought in six ways:

- Improving the social and cultural offering available to locals;
- Finding ways to improve public spaces between blocks of flats;
- Creating a model for entrepreneurial development;
- Finding ways to make socialist architecture more visually appealing;
- Identifying means to help local communities identify more strongly and positively with their place of residence;
- Ideas for new and more modern functions for public buildings constructed during the socialist period.

The project received a total of EUR 1.25 million in funding (84% from the ERDF and 16% from public co-financing).

The results: Revitalisation, learning and cultural identity

ReNewTown achieved its goals in several ways.

First, four pilot projects were organised in Poland, the Czech Republic, Slovenia and Slovakia:

- In **Kraków, Poland**, the ArtZONA[342] project involved the adaptation of a building to function as a gallery, meeting places for artists, performance space and a location for trade fairs for local entrepreneurs.
- In **Velenje, Slovenia**, a public space between apartment blocks was converted into a multifunctional facility for local people of different generations.
- In **Hnúšťa, Slovakia**, a socialist-era building (around 500 square metres) was transformed into a Museum of Socialist Curiosities.

[342] Funds for this project were provided by the Polish Ministry of Culture and National Heritage Grant Programme, Municipality of Kraków, Nowa Hu.ta District Council, National Cultural Centre.

- In **Prague 11, the Czech Republic**, the Centre for SMEs was created to provide support to local entrepreneurs.

Second, and linked to this, jobs were created for local people. Both ArtZONA and the Centre for SMEs in Prague 11 produced two full-time jobs. Meanwhile in Hnúšťa, one part-time position was created after the end of the pilot project.

Third, a large body of documents and databases was created. These have been used by local policy makers as an input to future policy. They included a 'market research report', a 'good practice report' with 61 examples of urban regeneration from across the region, three databases (good practice, initiatives and experts), a manual for post-socialist urban regeneration, and a book identifying 12 models to improve the lives of people living in post-socialist urban spaces. In total, the databases include 148 examples of good practice and initiatives.

Finally, a series of seminars was organised to achieve an exchange of experiences and to promote good-practice examples. This increased the chances of the results being used by policy makers, researchers and the general public in developing policy and undertaking further initiatives along these lines. The project results served as an input into the work of three local governments in Slovenia, and were used at the national level by researchers in Germany, Croatia, Poland and Slovenia.

ReNewTown had several lasting effects. First, some pilot projects have developed into lasting institutions. The ARTzona team continued their work related to the renewal of space and managed to convince local and national authorities to further support ARTzona. Over the last five years, ARTzona has obtained enough financial resources that allowed the team to carry out further renovation works. Thus, through the seed funding provided in the ReNewTown project ARTzona has become a cultural institution meeting the standards of the 21st century.

In Hnúšťa, the museum is now run on a voluntary basis, and continues to receive donations from local people for exhibitions (600 artefacts in total). It has provides means for younger people to learn about the lives of their parents and grandparents under communism.

Second, it showed citizens what they could do themselves to improve the post-socialist urban spaces in which they live. To illustrate, the positive impact of the volunteer work in the Velenje pilot action made such an impact on policy makers and the population that it was re-invoked to on other occasions, like for flood prevention measures along the river Paka.

Third, it provided a way to engage with and learn from the socialist past, and developed the participants' potentials. "*I believe the main success [of ReNewTown] was the development of people's competences and talents that could be used for further development of local communities. ArtZona pilot action from Krakow could serve as a perfect illustration. It is and excellent example as seed money from Central Europe Programme through the ReNewTown project were wisely invested both in human capital and infrastructure. The funds enabled to create a great team that was determined to gain new skills, knowledge, organize events for local communities and engage in new projects concentrated on culture*." (Magdalena Wątorska-Dec, Polish Academy of Sciences)

"*The positive unplanned effect of the ReNewTown project and especially the ARTzona pilot action implementation from our perspective is the recognition of our team members as experts in creating artistic spaces, raising funds for renewal activities and efficient implementers and partners of social and cultural projects. Thanks to that, we have started a permanent cooperation with Krakow Universities educating students in the field of art and culture management. We receive invitations to participate as experts in conferences, trainings and events dedicated to the cultural development and urban renewal*."
(Małgorzata Hajto, Artistic manager - ARTzona Cultural Center)

4. Outlook and conclusions on the needs and potentials of transnational cooperation in Central Europe

The final part of the study is divided into two steps. The first step summarises the findings of the previous parts and discusses the benefits and the value added of the CE Programme. The second step concludes with the findings, provides recommendations regarding the fourth call for proposals and looks ahead to a post-2020 Interreg CE Programme.

4.1. SUMMARY AND VALUE ADDED OF THE CE PROGRAMME

Clearly, the analysis in the previous parts shows that the Interreg CE Programme in particular and Interreg trans-national cooperation (TNC) programmes in general generate an extensive value added to EU Cohesion policy. The added value brought by TNC to the EU Cohesion policy is well recognised, and summarised in a recent paper drafted by a number of managing authorities and secretariats of transnational programmes:[343]

- Reduces regional disparities and increases economic cohesion by facilitating knowledge exchange, empowering disadvantaged regions through cooperation, building capacities and enabling territories to learn from each other;
- Builds trust across borders and fosters European integration by sharing similar challenges and cultures;
- Supports macro-regional strategies through funding, as TNC programmes provide targeted solutions designed for specific regions, bridging gaps between national and EU-wide initiatives;
- Increases territorial cohesion through the sharing of knowledge and experience, as well as the generation of capacities. Thus TNC explores new terrain and tests new approaches to common problems, thereby creating new ideas and building capacities;
- Improves the use of limited resources, as partnerships allow forces to be combined in order to tackle common challenges. TNC is essential for knowledge generation at the local level, enabling regions to apply up-to-date technologies and methods;
- Tackles challenges that go beyond national borders, e.g. water and air pollution, natural hazards like floods or the integration of transport systems;
- Helps authorities to improve services, as many TNC projects include the development of time-saving, innovative or improved solutions and methodologies. They increase cost-efficiency, accelerate the uptake of best-practice approaches, and facilitate a responsible use of public resources;
- Creates visible results attractive to cities and regions, making them more attractive places in which to work and live;

[343] See DG Regio, 2018.

- Is an innovative catalyst that triggers further public and private investment and accelerates urban and regional development. Many projects have strong experimental elements (i.e. pilot actions) that create opportunities to develop and test new ways of addressing major challenges. These projects serve to induce long-run positive effects through stimulating investment and policy action;
- Improves policy making and thus generates a long-term impact, by developing new approaches and methodologies and by demonstrating their feasibility to policy makers and other stakeholders from the business or research sphere. This involvement of stakeholders is crucial for embedding projects' results and to support their uptake by the public or private sector.

These points apply to many Interreg TNC programmes. Still, the added value of the Interreg CE Programme goes beyond them. Located as it is at the site of the former Iron Curtain, the programme has an important integrating function. For most parts, this function still includes bringing together countries, regions and people from two different ideological systems. Although the differences in the systems disappeared some time ago, their effects and backlashes are still felt as economic and social differences. Despite significant economic progress, the perceived slow progress in overcoming these differences over the past decades (in combination with the recent refugee crisis) is likely to be one reason for the increase in EU-sceptic and nationalistic trends on both sides of the former Iron Curtain.[344]

The Interreg CE Programme plays an important role in keeping the idea of EU integration up. Firstly, it does so by supporting **economic integration** and **cohesion** throughout the CE territory, but especially also in less favoured regions therein, e.g. through the exchange of knowledge and experiences between more and less developed regions, or the pooling of resources to tackle common challenges.

Importantly, the Interreg CE Programme area also covers the **industrial core** of the EU, which consists of Austria, the Czech Republic, Germany, Hungary, Poland and Slovakia.[345] The industrial core area produces around 40% of total EU manufacturing value-added exports[346] and 50% of EU value-added exports of advanced manufacturing sectors, i.e. machinery industry, electrical equipment industry and transport equipment industry.[347] Notably, Northern Italy or Slovenia are not explicitly included in this definition of the EU's industrial core. Yet, both have strong industrial background themselves, thus extending the CE territory's coverage of EU industry. Including both countries to the industrial core, would increase its share in total manufacturing value-added exports to 52% and its share in EU value-added exports of advanced manufacturing sectors to 58%.

Therefore, by supporting cooperation of the EU industrial core countries, especially in the areas of innovation, skills and entrepreneurship, the Interreg CE Programme does more than just increase the competitiveness of the respective countries. Given the importance of the industrial core for the whole EU (e.g. in terms of global competitiveness, as well as in the generation of effective demand), the CE Programme's benefits stretch across its programme area and affect the EU as a whole.

Furthermore, by supporting transport, energy and environment and even cultural heritage the Interreg CE Programme contributes to the **sustainability** of the industrial core in special and to sustainability in

[344] See European Council on Foreign Relations, 2018.
[345] Hanzl-Weiss et al., 2018.
[346] EU value-added exports are exports without intermediate inputs from other countries. That is, they reflect the actual value added generated and exported from EU countries.
[347] Compare to Stehrer and Stöllinger, 2015; Numbers estimated for 2014, based on OECD TIVA statistics.

the CE countries in more general terms. To illustrate, transport related Interreg CE projects led to a long run improvement of the connections between CE countries and regions, thus making trade of goods as well as private travelling easier and quicker. Likewise, energy and environmental projects not only contributed in making CE production processes more energy efficient and environmentally friendly, but also opened up new opportunities for creating businesses and jobs. Similar holds for cultural heritage projects, like. those re-vitalising old industrial sites or others promoting a CE identity.

The Interreg CE projects' effects also extended from the economic to the **social** and **territorial** sphere. Thus, a number of projects were directly, by e.g. addressing health and health care, employment, ageing etc. issues, and an even larger number or projects were indirectly contributing to social cohesion in the CE territory, through providing the basis for the creation of jobs and investments. Last but not least, the Interreg CE programme, through its administrative requirements on the one hand, and through the project outputs (strategies, action plans, pilot actions, trainings and capacity development etc.) on the other, promoted good governance throughout the CE territory, which not only is beneficial for economic development but also is the fundament for a deeper integration of the CE countries and regions.

Thus, overall, the Interreg CE Programme contributes to economic, social and territorial cohesion of the CE countries. Additionally, trans-national cooperation in the CE territory -by linking CE businesses, people and especially public administrations at the local, regional and national level- focusses on solving common problems, making it more resistant to changes in the overall political environment. Therefore in a way, the Interreg CE Programme not only supported economic, social and territorial cohesion but implicitly also **political cohesion**.

By focusing explicitly or implicitly on thematic priorities like innovation, transport/accessibility, environment, energy as well as natural and cultural resources both the CE 2007-2013 and the 2014-2020 Interreg CE Programme addressed a number of challenges to the CE countries and regions.

From a **functional point** of view, the CE Programme's focus on innovation, competitiveness and transport supported the CE territory's position as the EU's industrial core. Taking into account the fact that innovation is a crucial aspect of competitiveness in the globalised world, 2007-2013 projects like SMART FRAME (which created a network of local industry support services to facilitate technology transfer and cooperative R&D processes), CEBBIS (which identified regional best practices in technology transfer and established an ICT-based network of innovation intermediaries) and the 2014-2020 project AMiCE (which promotes advanced manufacturing technologies) are good examples of how TNC can improve innovation processes.

Also, by supporting specific industries like the chemical industry (e.g. PLASTiCE, CHEMLOG and the NANOFORCE project) and the automotive industry (the AutoNet project), the CE Programme contains some elements of an industrial policy that aims at improving the region's position in a global economy.

The transport priority axes were essential for improving the connections of the CE between each other, not only in the **East-West** direction but importantly also in the **North-South** direction. Given the central location of the CE countries the improvements in CE connectivity had a wider European impact as it brought also countries East and West as well as North and South of the CE territory closer together. CE 2007-2013 projects like BATCo, SoNorA or Via Regia plus played an important role in implementing the TEN-T Core Network in the CE territory, while current Interreg CE projects like CONNECT2CE and

Peripheral Access tackle the weak accessibility of peripheral and cross-border areas in CE. Both types of projects connect the CE territory internally and externally, thereby supporting a) CE industry, by facilitating the transport of goods and b) people (especially in more remote areas), by making jobs more accessible. What is more, many of these infrastructure projects are the basis for future large-scale investments; hence aside from connecting CE, these projects also generate a large investment demand.

Besides improving the CE territory's functionality, the CE Programmes also address a number of challenges that are of common interest and are best solved in a cooperative manner, like the energy challenges or the environment challenge, including the circular economy and climate change.

As far as the energy challenge is concerned, two major issues are energy efficiency and renewable energy. Regarding **energy efficiency**, CE Programmes have demonstrated various options to save energy at the local and regional level. This is exemplified by the large number of past and current projects in this area, such as CombinES (funding of energy-efficiency measures), VIS NOVA (elaborating energy-efficiency plans), GovernEE (pilot training events to raise awareness regarding the challenges of sustainable buildings), EnergyCity (online tool for calculating energy savings potentials in homes), CEC5 (pilot actions to demonstrate energy-efficiency measures and renewable energies in buildings), etc. Projects of the current Interreg CE Programme include BOOSTEE (governance of energy efficiency in public buildings) or ENERGY@SCHOOL (reducing energy consumption in public schools).

Also the topic of **renewable energy** received attention through CE 2007-2013 projects like 4BIOMASS and COACH BioEnergy (promoting biomass energy), RUBIRES (renewable energy sources and increasing energy efficiency) and TRANSENERGY (geothermal energy). The support of renewable energy is continued in the current period through the Interreg CE project REEF2W (renewable energy and energy efficiency in waste management and wastewater treatment).

The CE Programmes have been equally active on the **environmental** side. A large number of projects have addressed major issues regarding environmental sustainability, the circular economy or mitigating and adapting to climate change. Thus, the waste issue was addressed by TransWaste (informal waste collection), CERREC (reuse of waste), and EcoPaperLoop (waste paper). A main project targeting climate-change adaptation was the INCA-CE project, which established a state-of-the-art forecast system for atmospheric, hydrological and surface conditions, thus improving environmental management. Another important project was UHI. It developed policies and practical actions to reduce the impact of the urban heat island phenomenon.

A number of CE 2007-2013 projects have focused on air pollution, like TAB (pollution from industry, transport and households) or UFIREG (ultrafine particle pollution). Water management and flood protection have been covered by the EULAKES project (sustainable management of CE lakes and their adaptation to climate change and other environmental stressors), the LABEL project (reducing flood risk along the Elbe river) or the CEframe project (integrated flood protection management), etc. Additional projects have also focused on soil protection or the revitalisation of brownfield sites (URBAN-SMS, COBRA MAN) as well as on biodiversity and landscape protection (Greennet, TransEcoNet, SALVERE or VITAL LANDSCAPES).

An important contribution to environmental sustainability has also come from the transport axis, as many projects have improved the quality of the environment and have reduced transport emissions (of GHG,

pollutants and noise). Six projects (BICY, Central MeetBike, TROLLEY, REZIPE, GUTS, INTER-Regio-Rail) dealing with passenger transport have helped to reduce GHG and pollutants emissions by promoting a modal switch in urban areas. Equally, five freight transport-related projects have focused on multimodal transport (INWAPO, SoNorA, BATCo, EMPIRIC, ChemLog T+T).

A small number of CE projects have explicitly addressed issues related to the challenges of **employment** and **skills**, **social risks** and **demographic change/migration**. Mostly these were projects from the innovation axis (partly also from the competitiveness priority axis), which provided some space for these topics. For example, the CE-Ageing Platform and the Senior Capital projects dealt with the labour market implications of ageing and promoted employment and skills creation among people aged 45+ years. Other projects concentrated on the problem of out-migration, especially from rural regions. The WOMEN project focused on the brain drain of well-educated young women, the YURA project developed a transnational youth strategy for regions suffering from out-migration. Also, the Re-Turn project promoted return migration to enhance human capital and the entrepreneurial abilities of returning migrants in CE regions.

Social risks were addressed by the EURUFU project, which aimed at improving the future viability of rural areas and ensuring their supply of public services, e.g. in the health and social sector. One notable project example is IntraMED-C2C, which targets capacity building regarding innovation transfer in the medical sector. In the current 2014-2020 period, three more Interreg CE projects address health issues. The digitalLIFE4CE project is looking for novel solutions in the field of digital integrated healthcare systems, the Focus in CD project intends to develop and test innovative health service models in the management of celiac disease, while the INTENT project intends to find solutions for innovative patient-centred cancer care.

In response to recent challenges, some Interreg CE projects also focus on social innovation, like ROSIE (improving skills among entrepreneurs and innovation actors to promote responsible innovation in companies), SENTINEL (providing solutions for social enterprises regarding skills development, mentoring and cooperation) and INNO-WISEs (connecting actors from social enterprises, research, technological experts and relevant public authorities to improve the integration of disadvantaged people).

Implicitly, many of the CE projects have also addressed two more challenges, i.e. the **digital economy** and **governance as a horizontal issue**. By creating databases, web tools, models (e.g. for transport or environment), platforms, websites, etc., the vast majority of projects have promoted the use of ICT and digital solutions in transnational cooperation, making it faster and more efficient, and also considerably expanding its outreach to stakeholders or the general public. Thus many projects also contributed implicitly to the EU's 'Digital Agenda'.

Similarly, many CE projects have had strong **capacity building** elements involving training, the creation of guidelines and strategies, the collection of best practice and pilot actions. These have often been accompanied by explicit or implicit goals to set up transnational institutions and/or governance structures. Thus, the CE Programme and its projects have made a significant contribution to the improvement of governance in the CE territory, which, as also the survey has shown, is a long-run effect that is still visible long after the projects have ended.

The CE 2007-2013 Programme also contributed significantly to other EU policies. Thus, 56 out of the 124 CE 2007-2013 projects contributed directly to one or more of the EU's **macro-regional strategies** (MRSs), i.e. to the Baltic and Danube MRSs, as well as to the Adriatic–Ionian and Alpine MRSs.[348] Notably, the CE Programme is the only Interreg TNC Programme that bridges all four current MRS areas. As such it not only is one potential source of funding for projects of all four MRS. Much more, it is also an important link between the four MRS that potentially enables coordination of the MRS, for example in pan-European issues like transport routes. Being aware of this role, a future Interreg CE programme could thus be used to link the MRS where possible and useful and thus to enhance their effects.

Of the MRS-related CE 2007-2013 projects, the majority addressed the Danube region, so that the projects' contributions were distributed among the four programme priorities, e.g. Centrope-tt contributed directly to the macro-regional Priority Area 8 'To support the competitiveness of enterprises', while Danube Limes was in line with macro-regional Priority Area 3 'To promote culture and tourism, people to people contacts'.[349] Contributions to the Baltic and the Adriatic–Ionian macro-regions were also fairly represented. Some projects contributed to both macro-regions, based on their topics (e.g. the projects EnSURE and PROINCOR), while others linked the two areas (e.g. the transport projects SoNoRa and BatCo). With regard to the Alpine region, around 7% of the CE projects could be directly linked to it.[350]

From a different perspective, the CE 2007-2013 Programme also contributed strongly to the **EU 2020 strategy**, specifically to the aim of smart, sustainable and inclusive growth. **Smart growth** was mainly supported by projects on the 'innovation' priority axis, like SMART FRAME, which strengthened links in the innovation chain by mobilising innovation potential in several high-potential technology fields. Furthermore, it developed transnational R&D cooperation and led to the creation of spin-offs. Other priority axes also contributed to smart growth. For example, the accessibility priority project LOGICAL developed innovative ICT services based on cloud computing to improve interoperability regarding multimodal logistics in Central Europe. Similarly, from the environment priority, project INCA-CE developed 'now-casting' models for a more accurate and timely forecasting of severe weather events.

Sustainable growth was supported by projects from the accessibility priority, promoting low-carbon, resource-efficient, secure and competitive transport systems, like the BATCo project or ChemLog, which improved the European transport infrastructure and services by developing joint strategies for transport logistics for the chemical industry. Big contributions came from the environment priority. By way of illustration, the project 4BIOMASS promoted a low-carbon economy by supporting the sustainable use of renewable energy from biomass. Additional sustainable growth impacts came from the competitiveness priority, e.g. COBRA MAN reduced environmental impacts and promoted economic growth by rehabilitating post-industrial brownfield sites.

Contributions to **inclusive growth** have come inter alia from the CE Programme's innovation priority, e.g. ET-struct, which bridged the gap between education and work by building a Europe-wide network of regional experts and decision makers in the fields of the economy and education. Also, the project Q-AGEING, from the competitiveness priority, supported the participation of older people in community work and labour market, while the project Traditional and Wild addressed the issue of ethnic minorities

[348] See Central Europe Managing Authority, 2017.
[349] See Central Europe Managing Authority, 2011.
[350] See Central Europe Managing Authority, 2011.

being particularly exposed to the risk of poverty. The project built on these groups' traditional knowledge of wild plants to promote the plants' collection, processing and use to generate income and jobs.[351]

Besides these contributions to EU policies and strategies, many CE 2007-2013 projects addressed **other major EU topics** on an individual basis. This is exemplified by a number of environmental projects. Hence, TransWaste and CERREC helped achieve the targets set in the EU Waste Directive, through their promotion of waste-management activities, with TransWaste contributing especially to help reach the hazardous waste goals. Similar contributions were made by the ACT CLEAN and PRESOURCE projects.

The UFIREG (tackling the emission of ultrafine particles) and TAB (tackling the health effects of air pollution) projects contributed to achieving the targets of the Air Quality Framework Directive, while projects like REURIS contributed to the Water Framework Directive by restoring the ecological functions of rivers. Similarly, the LABEL, CEframe and INARMA projects contributed to the Floods Directive, which requires EU Member States to prepare flood hazard risk maps and flood risk maps. Finally, four projects –Greennet, TransEcoNet, SALVERE and VITAL LANDSCAPES – contributed to the goals of the Habitats Directive and the EU Biodiversity Strategy.

4.2. CONCLUSIONS, RECOMMENDATIONS AND OUTLOOK

This analysis provides clear evidence of the benefits of the CE Programme. First, TNC in the CE territory has reduced barriers between policy makers, the business and research sphere, local and regional administrations and planners and other stakeholders both within countries and across borders. Among many other examples, this is illustrated by survey results showing the sustainability of cooperation and the creation of new cooperation thanks to the CE Programme. Secondly, the reduction of barriers has also improved the coordination of policy makers and local authorities, as is seen in many projects setting up specific governance structures to tackle common problems.

Thirdly, public (and private) management capacities have increased through the creation and exchange of knowledge fuelled by studies, the collection of best practice, pilot actions, training, etc. Finally, the benefits of the CE Programme and many of its projects have not been limited to the programme's countries. Rather, the CE Programme has produced a considerable value added, contributing both to wider EU strategies as policies and to economic, social and territorial development.

Outlook and recommendations for the fourth call

Against this background, the recommendations regarding a potential focus for the **fourth call for project proposals** are conservative and practically oriented, taking account of the distribution of current Interreg CE projects. A comparison of the programme funds allocated to the four priority axes and the funds actually committed to projects in the first and second calls shows that:

- Priority 1 – Cooperating on innovation to make CE more competitive has absorbed **66**% of the available funds for Priority 1.

[351] See Central Europe Managing Authority, 2011.

- Priority 2 – Cooperating on low-carbon strategies in CE has absorbed **77**% of the available funds.
- Priority 3 – Cooperating on natural and cultural resources for sustainable growth in CE has absorbed **71**% of the available funds.
- Priority 4 – Cooperating on transport to better connect CE has absorbed **57**% of the available funds.

As the selection process for Interreg CE projects from the third call is ongoing no final judgement can be made about the balance of projects across priority axes. Thus, it is difficult to provide recommendations regarding a potential thematic focus of the fourth call for project proposals. Additionally, given the current absorption rates it is to be expected that after the third call, funds for fourth call projects will be limited. Still, a straightforward recommendation for the fourth call is, that, provided one Priority is still underrepresented in terms of projects and/or has a low absorption rate, focus should be put on this Priority.

Alternatively, an interesting strategy for the forth call could be to maximise the Programme's impact by focussing on existing project results, for example from first and second call projects, and leverage them in terms of extending them to other CE regions, extend them in terms of their scope, or scale them up or down from a policy point of view, i.e. transfer them from the local to the regional or even national level or vice versa.

This requires an evaluation of current Interreg CE project results, with respect to their effects and their applicability to a wider set of regions. Some Interreg CE projects are very specific in their aim. For example the NewPilgrimAge project aims at developing a European Cultural Route following the traces of Saint Martin. Such programs might be difficult to transfer to other regions or policy levels. Many other projects show a strong potential for leveraging their results. To illustrate, the BIOCOMPACK-CE project promotes stronger linkages between R&D institutions and companies to introduce verified biodegradable materials in paper and cardboard packaging. This project consortium consists of research institutes, private companies, a chamber of commerce and a regional development agency. Provided the project shows good results, it could be used as an example project for the fourth call, which could try to bring the project's aim to a higher policy level, by especially addressing local or even national policy makers or other relevant institutions.

Furthermore, based on the analysis, three more general recommendations can be given that may contribute to increase the projects' impacts.

First, to ensure long run sustainability of the projects political buy-in is key. Past projects with long run effects inter alia contributed to increase capacities of the public sector (e.g. local and regional governments) and/or to improve policy processes. Thereby, pilot actions, with their demonstration effect, awareness raising events as well as the formulation of policy documents showed to be most successful in securing political buy-in.

Second, long run and positive side effects were also achieved on an institutional level, through the continuation of co-operation between partners after a project's lifetime or through the creation of new co-operations. This needs to be supported or continued to be supported in a future CE programme.

Third, if it is for increasing economic effects, projects with the aim to leverage or prepare investments, induce innovation or include the transfer of technology have shown to yield better effects than other projects.

Outlook and recommendations for a post-2020 Interreg CE programme

As far as a **post-2020 CE Programme** is concerned, three issues are worth considering:

- The CE Programme's area covers the **industrial core** of the EU. This could be used to create an **'identity'** for a future CE Programme, also guiding its future focus. Notably, covering the industrial core also provides a unique function to the programme area, making it a highly important – if not indeed the most important – functional region within the EU. Its industrial development is a key factor for the global competitiveness (and hence the political influence) of the EU. Moreover, there are positive economic spill overs to all other EU countries, e.g. through the creation of demand. Supporting the development of the CE territory and improving further its economic functionality should therefore be a guiding principle of a future CE Programme.
- The CE Programme brings together countries from both sides of the former Iron Curtain. This has economic, social, territorial as well as political implications. Despite major progress, economic and social differences between 'Eastern' and 'Western' CE countries are still pronounced. The previous and the current programme show that a CE Programme contributes strongly to overall EU cohesion policy in terms of economic and social development. There is no doubt that a future CE Programme will continue to do so.
- The CE Programme not only connects the East with the West, but importantly also the North and the South of Europe. In a literal sense, the CE territory connects the Scandinavian and Baltic countries with Southern Italy as well as the Western and Eastern Balkan countries. In a figurative sense it does much more than this. Besides linking the economically more prosperous countries in the North with less prosperous countries in the South (corresponding to the East-West divide), it also provides a cultural bridge all the way from Scandinavia to the Mediterranean Sea.

Based on these points it can be concluded that CE is a highly functional area with a special role in the EU. This differentiates the CE territory from other regions in Europe. Its role and functional relationships are not only based on the geographic proximity of countries or the sharing of common challenges. Much more it is the strength and number of interactions and linkages between a) economics and business (e.g. trade and investment linkages), b) administrations and the political sphere (e.g. Visegrád group, Centrope) and c) people (cultural and historical ties) in the CE territory that give it a special place in the EU.

Correspondingly, the main strength of the CE Programme is its ability to support territorial cohesion and integration within its geographic boundaries but in a unique way for TNC programmes also across its borders. This becomes ever more important as EU scepticism and disagreement with fundamental European values increase. Because of this, a future CE Programme needs to be highly aware of its potential to strengthen territorial and political cohesion, and needs to make it a foundation of its work. In this respect, it is advantageous that the CE Programme covers all the countries along the former Iron Curtain, especially Germany and Poland. These countries are among the biggest EU countries, and both their relationship with one another and their attitude to the EU are highly influential for others.

With the potential focus on a) being the industrial core of the EU, b) promoting economic, social and territorial cohesion along the former Iron Curtain and c) connecting Europe from North to South and from East to West the CE Programme fits well into the post 2020 Cohesion policy architecture as outlined in the recent proposals for the Common provisions , ERDF and European territorial cooperation regulations. To illustrate, the CE Programme's focus allows covering directly or indirectly all 5 policy objectives for the Structural funds outlined in Article 4(1) of the common provisions proposal. Thus, the 'smarter Europe' objective overlaps strongly with the potential focus on being the industrial core, as supporting the industrial core requires a) strengthening research capacities and employing advanced technologies, b) reap the benefits of digitisation, c) enhance the competitiveness of SMEs and d) develop the necessary skills to support these processes.

Likewise, the CE Programme's ability to connect Europe directly relates to the 'more connected Europe' policy objective, which supports a) digital connectivity b) inter and intraregional connectivity through investment in the TEN-T network and in the access to this network and c) sustainable urban mobility. All points are not only common challenges to the CE countries but also have been already addressed by the past and current Interreg CE programme. In this respect would the future Cohesion policy architecture enable the CE Programme to continue its role of connecting Europe.

As far as the other three policy objectives, a) 'greener, low carbon Europe, b) 'more social Europe' and c) 'Europe close to citizens' are concerned, they too already have been covered by the past and current Interreg CE programmes. Thereby, the necessary thematic concentration of a future programme could mean that not all three objectives can be supported directly, thus requiring to choose one of them as priority. Given the analysis of challenges and results of the CE programme, it is recommended that the focus is set on the 'greener, low carbon Europe' objective as it is not only one of the most fundamental challenges but also has some economic potential (e.g. through the development of new technologies). The 'more social Europe' and the 'Europe close to citizens' will be covered as horizontal issue. On the one hand, economic progress in the CE territory will relieve pressure on the social side, while on the other hand it is an inherent feature of the CE Programme to bring people closer together,

Therefore these three cornerstones – i.e. the function as the EU's 'industrial core', the programme's importance in promoting territorial and political cohesion in the EU and its role in connecting EU countries from North to South and East to West – could be fundamental to the development of a post-2020 CE Programme. Hence improving the programme's area function as a core region for industry and political cohesion could provide the programme with an overarching aim that future projects could focus on, whether explicitly or implicitly.

Correspondingly, supported projects could evolve around the priorities of a) innovation, b) transport, c) industry, knowledge-intensive services and skills and d) environment and energy, with the cross-cutting topics of digitisation and governance featuring in the projects' implementation.

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6. Annex – Questionnaire

6.1. PURPOSE

The purpose of the questionnaire is to identify:

- Whether the 2007-2013 Central Europe projects had effects beyond their lifetime;
- Where they had long-run effects, e.g. for which stakeholder group;
- How they had long-run effects, e.g. which types of output generated long-lasting effects;
- Why they had long-run effects, e.g. because of investment generation, effects on institutions or governance, etc.
- What the long-run effects are for project partners in terms of further cooperation/creation of new cooperation potential.

6.2. QUESTIONS

1	**Acronym of 2007-2013 Central Europe project**	**Drop down list**
2	**Priority Axis**	**Drop down list**
3	**Area of Intervention**	**Drop down list**
4	**Please rate the overall impact of your project**	**Low – Medium – High – Very High**

5	**Which outputs did your project produce? (please select the three most relevant outputs)**	
	Studies and background papers	Yes/No
	Pilot actions	Yes/No
	Awareness raising events, stakeholder events	Yes/No
	Workshops and training	Yes/No
	Feasibility studies	Yes/No
	Handbooks & guidelines	Yes/No
	Networks creation	Yes/No
	Policy documents, strategies, action plans and recommendations for policy improvement	Yes/No
	Physical investments	Yes/No
	Tools	Yes/No
	Other	Yes/No

6	**What were the effects of the project in your region?**	
	Economic effects	
	Stimulated investment and funds leverage	Yes/No
	Generated its own revenues	Yes/No
	Increased productivity	Yes/No
	Induced innovation and/or technology transfer	Yes/No
	Generated jobs	Yes/No
	Other economic effects	Yes/No
	Institutional effects	
	Created networks	Yes/No
	Led to further cooperation	Yes/No
	Increased institutional capacities	Yes/No
	Other institutional effects	Yes/No
	Governance effects	
	Changed/improved legislation	Yes/No
	Created new management structures	Yes/No
	Changed/improved policy processes and methods	Yes/No
	Transfer of know-how/increased capacities	Yes/No
	Created/improved multi-level governance	Yes/No

	Other governance effects	Yes/No

7	**How long did the most relevant effects last after the completion of the project?**	
	Economic effects	0 years; 1-2y; 3-4y; more than 4y
	Institutional effects	0 years; 1-2y; 3-4y; more than 4y
	Governance effects	0 years; 1-2y; 3-4y; more than 4y

8	**Which stakeholders were affected by your project?**	
	Public sector (e.g. national, regional and local authorities)	Yes/No
	Private sector (e.g. businesses, SMEs)	Yes/No
	Research & RTD (university faculty, college, research institution, RTD facility, research cluster)	Yes/No
	Intermediaries (e.g. business support organisations, like chamber of commerce, chamber of trade and crafts, business incubator or innovation centre, business clusters)	Yes/No
	Interest groups (trade union, foundation, charity, voluntary association)	Yes/No
	General public	Yes/No
	Other	Yes/No

Please provide contact details of a specific institution that was affected (optional):

9	**How long did the most relevant effects on the stakeholders last?**	
	Public sector (e.g. national, regional and local authorities)	0 years; 1-2y; 3-4y; more than 4y
	Private sector (e.g. businesses)	0 years; 1-2y; 3-4y; more than 4y
	Research & RTD (university faculty, college, research institution, RTD facility, research cluster)	0 years; 1-2y; 3-4y; more than 4y
	Intermediaries (e.g. business support organisations, like chamber of commerce, chamber of trade and crafts, business incubator or innovation centre, business clusters)	0 years; 1-2y; 3-4y; more than 4y
	Interest groups (trade union, foundation, charity, voluntary association)	0 years; 1-2y; 3-4y; more than 4y
	Other	0 years; 1-2y; 3-4y; more than 4y

10	**Do you still cooperate with your project partners? With how many project partners do you still cooperate**	Yes/No and Number

11	**Did the Central Europe project lead to new instances of cooperation for you in the CE region? If yes, to how many?**	Yes/No and Number

12 Please highlight a particular impact you consider most relevant (optional)

6.3. ANNEX

Question 1 – drop down list

4BIOMASS
ACCESS
ACT CLEAN
ACT4PPP
ADAPT2DC
airLED
AutoNet
BATCo
BICY
CCC
CE-Ageing Platform
CEBBIS
CEC5
CEEM
CEframe
CENILS
CENTRAL MARKETS
Central MeetBike
CentraLab
CentralCommunity
CENTROPE CAPACITY
Centrope_tt
CEP-REC
CERIM
CERREC
CHAMPIONS
ChemLog
ChemLog-T&T
CIRCUSE
CITY REGIONS
ClusterCOOP
CLUSTERS-CORD
CluStrat
CNCB
COACH BioEnergy
COBRA MAN
CombinES
CoP
C-PLUS
Creative Cities
CROSSCULTOUR
CUSTODES
Danube Limes - UNESCO World Heritage
DANUBENERGY
E2BEBIS
ECOPAPERLOOP
EDITS
EMPIRIC
EnergyCity
ENERGYREGION
EnSURE
EPOurban
ESSENCE
ETNOFOLK
ET-struct
EULAKES
EURUFU
FLAME
FLAVIA
FOKS
FORT
Forte Cultura
FREE
GovernEE
Greennet
GUTS
HABIT-CHANGE
HELPS
HERMAN
i.e. SMART
I3SME
IDEA

INARMA
INCA-CE
INNOTRAIN IT
InoPlaCe
INTER-Regio-Rail
IntraMED-C2C
INWAPO
KASSETTS
LABEL
LiCEA
LISTEN TO THE VOICE OF VILLAGES
LOGICAL
MANERGY
NANOFORCE
PLASTiCE
PRESOURCE
PROINCOR
Q-AGEING
QUALIST
RAILHUC
ReNewTown
ReSOURCE
Re-Turn
REURIS
REZIPE
RUBIRES
SALVERE
SEBE
SECOND CHANCE
Senior Capital
SHIFT-X
SMART FRAME
SOL - Save Our Lives
SoNorA
Support Patients through E-services Solutions
TAB
THETRIS
Traditional and Wild
TransEcoNet
TRANSENERGY
TransWaste
TROLLEY
UFIREG
UHI
URBAN_WFTP
URBAN-SMS
UrbSpace
Via Regia plus
VIS NOVA
VITAL LANDSCAPES
WOMEN
YURA

Question 2 – drop down list

Priority 1 Facilitating innovation across Central Europe
Priority 2 Improving accessibility to, and within, Central Europe
Priority 3 Using our environment responsibly
Priority 4 Enhancing competitiveness and attractiveness of cities and regions

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Question 3 – drop down list

1.1 Enhancing Framework Conditions for Innovation
1.2 Establishing Capabilities for the Diffusion and Application of Innovation
1.3 Fostering Knowledge Development

2.1 Improving Central Europe's Interconnectivity
2.2 Developing Multimodal Logistics' Cooperation
2.3 Promoting Sustainable and Safe Mobility
2.4 Promoting Information and Communication Technologies and Alternative Solutions for Enhancing Access
3.1 Developing a High Quality Environment by Managing and Protecting Natural Resources and Heritage
3.2 Reducing Risks and Impacts of Natural and Man-made Hazards
3.3 Supporting the Use of Renewable Energy Sources and Increasing Energy Efficiency
3.4 Supporting Environmentally Friendly Technologies and Activities
4.1 Developing Polycentric Settlement Structures and Territorial Cooperation
4.2 Addressing the Territorial Effects of Demographic and Social Change on Urban and Regional Development
4.3 Capitalising on Cultural Resources for More Attractive Cities and Regions

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