

First ESPON 2013 Synthesis Report  
ESPON Results by summer 2010

New Evidence on  
Smart, Sustainable and Inclusive Territories



The ESPON 2013 Programme

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The publication is based on reports from ESPON project available by summer 2010. These reports were prepared by transnational project groups of researchers and experts implementing Applied Research projects and Targeted Analyses for ESPON. A list of the project is available at the end of this publication.

Information on the ESPON programme and projects, the complete reports and partners involved can be found on [www.espon.eu](http://www.espon.eu)

The ESPON website always presents the latest developments in the ESPON programme and finding from ESPON projects. It offers the opportunity to consult in detail the ESPON publications and tools, the project reports and indicators available in the ESPON database.

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#### Disclaimer

The content of this report is based on the results of applied research projects by transnational teams of researchers taking part in the ESPON 2013 Programme. As such, the maps and texts do not necessarily reflect the opinion of the ESPON Monitoring Committee.



The mission of the ESPON 2013 Programme is to support policy development in relation to EU Cohesion Policy. It does this by providing evidence and knowledge about European territorial structures, trends, perspectives and policy impacts which enable comparisons amongst regions and cities and which supports the understanding of European territorial diversity.

The current policy debate at European level is focusing on three main avenues:

- The implementation of the new Treaty Aim of Territorial Cohesion.
- The contribution of Cohesion Policy measures to the Europe 2020 Strategy of Smart, Sustainable and Inclusive Growth within Europe.
- The content of an EU Cohesion Policy after 2013.

The challenge for ESPON is to support evidence based policies in European regions, cities and larger territories that reflect the current dynamics and build on the diversity of territorial potentials embedded in each region and city.

The ESPON 2013 Programme meets this challenge by commissioning applied research on themes defined by policy makers in the field, and then disseminating the main results and key messages for place-based policy processes.

The European perspective upon national, regional and local development is becoming an intrinsic component of smart, sustainable and inclusive growth - strategic goals that can only be met through the active contributions of all European regions and cities.

In a swiftly changing world, place-based policies need to include a larger territorial context in order to understand and harvest the existing development potentials and so improve European competitiveness.

One important option for added value is to see opportunities to grow stronger through territorial cooperation, through networking or in concrete cooperation strategies with neighbouring regions and cities building on comparative advantages and together creating higher critical mass.

This ESPON report presents a synthesis of results from the first major Applied Research projects undertaken by the ESPON 2013 Programme. It is also garnished with examples from Targeted Analyses supporting the use of results by Member States, regions and cities. The first research themes have focused on the functionality of major urban agglomerations, the diversity of development options for rural regions, demography and migratory flows, the risks for regional economies of energy price fluctuations, territorial impacts of climate change and progress in techniques in support of territorial impact assessment of EU sector policies.

The report is the first in a series of three ESPON Synthesis Reports which all aim to communicate major ESPON results on numerous ongoing research themes relevant for integrated, place-based policy considerations.

You are invited to use the ESPON results, data and maps available which can all be accessed for free on [www.espon.eu](http://www.espon.eu).

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The decade up to the financial and economic crisis saw better balance and more polycentric development at European scale. The financial and economic crises however slowed the general progress and growth and impacted on the economy of nations, their regions and cities asymmetrically and with different force.

How can place based actions contribute to Europe's recovery from the financial and economic crisis that struck in 2008? What concrete measures by regions and cities can support the Europe 2020 Strategy and a smart, sustainable and inclusive growth path? How can the EU aim of Territorial Cohesion become an inherent result of this process?

Place-based policy making to realise the territorial potentials of European regions and their diversity has a key part to play. A stronger focus on the territorial dimension can improve the coordination and efficiency of public policies and private investments. Territorially targeted measures make use of Europe's diversity to strengthen economic growth and reduce imbalances in territorial development and enhance social cohesion. Recovery and growth strategies need knowledge and understanding of the territorial structures and dynamics shaping development across Europe, benchmarking the position of regions and cities.

ESPON meets this need through applied research projects analysing development across 31 countries. ESPON also drills down into greater detail through a related series of "targeted analyses" which are custom-built by trans-national groups of stakeholders. The new research results and their concrete use point the way to integrated action for territorial development at every scale from local to European, underlining their potentially positive contributions to economic recovery and the Europe 2020 strategy as well as to Territorial Cohesion and a balanced and polycentric Europe.

Headline findings are:

- Europe's position in the world is changing: there is not only the economic challenge from Asia and the Americas; other challenges with a global dimension include an aging labour force and demographic change, energy supply and demand, and the possible impacts of climate change.
- Europe's competitiveness depends greatly on its global cities and metropolitan regions, where enterprises can benefit from agglomeration economies and networks linking global market places.
- Connectivity is important. Liveable and smart places have good connections and an attractive environment. Metropolitan regions need good accessibility to each other and to global markets. The number and quality of connections to hubs and urban centres are important preconditions for efficient functional integration of all parts of all parts of the EU.
- Europe has many smart rural regions that are well connected to the global economy, accessible to urban centres and have turned local assets into development opportunities.
- Accessibility of regions and cities is increasing through infrastructure investments which benefit the economic competitiveness of the se places. Europe's high-speed rail network could play a greater role in the development of a polycentric Europe: still too often national networks do not look sufficiently ambitious beyond borders.
- Vulnerability to climate change impacts is a concern especially in regions where adaptation and mitigation strategies are not sufficiently in place or effectively enforced.
- Good governance and territorial co-operation are vital at every geographical scale, including partnerships at the level of city-regions and larger macro-regions, as well as across policy sectors.

## Navigating Europe's position in a changing world

Europe, its member states and their regions, is more exposed to global shocks and international competition than at any time before. As the world becomes more interdependent this trend will continue and shape policy thinking in all sectors and at all geographical scales. On a number of baseline measures and trends – population, total GDP, oil and gas reserves, land area – Europe is small, somewhat fragmented and less strongly positioned compared with the dynamism of Asia, the strengths of North America, resource-rich Russia and Africa, and the ascendancy of South America.

- Europe's share of the world's economy is declining: 50 years ago, the six founding members of the European Community had a share of about 21% in the world economy. Today's 27 EU members together have about the same share. The 31 countries in ESPON have a share that is estimated to be about 27% (2008 figures).
- Europe's population is expected to peak soon, and then decline by as much as 40 million by 2050 on some scenarios, while the population growth continues in countries in the Neighbourhood such as Turkey and those in North Africa and offers potentials for the European labour market.
- Climate change is likely to impact on the development of Europe through hotter summers and water shortage in the south, greater flood risks and snow melting in winter sports areas, sea level rise and increasing damage through winter storms in the north – according to currently prevailing models.
- Increasing global competition, an aging and more diverse population, and rising energy costs could put pressure on the European social model.

Europe is however still a continent rich in economic terms, with economic strength and specialisation and corresponding human resources and skills. Also the European territory, with a dense network of places built through history, has many competitive advantages vis a vis other continents. Understanding and unleashing territorial development opportunities can stimulate further a smart, sustainable and inclusive growth trajectory in Europe. A place-based approach, integrating sector contributions, can unlock development potentials in all regions and cities, and increase territorial cohesion, at the European scale, and within nations as well as at regional and local levels.

## Polycentric Europe: smart, connected places

Europe is one of three global regions with significant concentration of enterprises of worldwide importance. Europe and many of its regions are strongly integrated into the global economy e.g. via locations of multinational firms. There is, however, a considerable territorial concentration when it comes to the location of the decision-making powers and ownership relations. Within Europe, London and Paris stand out in the sheer number of subsidiaries that are controlled from there. However, international firms in other metropolitan regions and even quite small cities also exercise substantial control over subsidiaries in the rest of the world. Examples of such headquarters cities are Geneva, Basel, Trieste, Arnhem, Lausanne, Clermont-Ferrand, Munich, Frankfurt, Edinburgh or Stockholm. In contrast, companies in the city regions in Ireland, Wales, Northern England, Portugal and eastern Europe are to a large extent controlled by headquarters in other countries.

Nanotechnology, biotechnology, information technology and cognitive science (usually abbreviated to NBIC) are expected to drive the next innovation wave by 2020. The largest capital cities and economic centres are the key hubs in these innovation networks. Other urban regions such as Barcelona, Glasgow, Edinburgh, Gothenburg, Hannover, Stuttgart, Munich or Milan have the potential to become more specialised nodes. The research capacity of higher education institutions and private companies in these locations is a vital asset for recovery through smart connected places. The challenge is to ensure that Europe's research and enterprise networks are connected to global knowledge networks, yet also motors for jobs and growth in their own regional economies.



Places that can be reached for day-return business trips have an economic advantage. The network of urban areas where one-day business trips are possible shows a clear European core-periphery pattern. For most metropolitan areas, air is the prime transport mode for inter-metropolitan links, though high-speed rail connections play an important role for links between cities within a country. At present, rail connections are less attractive for cross-border contacts, because of the prevailing national orientation of networks.

There are also innovative rural regions that profit from their global connectivity. Innovative and high-tech companies with worldwide trading and links can be found in rural areas in Finland, Norway, southern Germany and other parts of Europe. Also the natural resource base of rural areas allows them to be players in global markets, linking directly to clients around the world. Regions in the Nordic Countries seem to overcome their peripheral location by capitalising on strengths in relation to ICT, research, educational and environmental opportunities. The diversity and economic potential of rural Europe can however be even best utilised in an overarching rural development approach embracing the strengths of all sectors present. This means moving beyond the traditional view of the countryside as a place mainly defined by agriculture.

### **Diverse Europe: the cohesion challenge**

Traditionally Europe has been divided by national boundaries. Overcoming internal and external borders creates new economic opportunities. 23% of cities in the ESPON space have the potential to build cross-border metropolitan regions by linking up with cities on the other side of the border which are within commuting distance. These regions are mainly concentrated along borders stretching from the Benelux countries to Northern Italy, but also along those situated between Slovenia, Hungary, Slovakia and Poland.

Seizing territorial development potentials requires cooperation between different stakeholders. Transnational and macro-regional development strategies that bring together stakeholders from different countries and sectors are being used as one way forward in the Baltic Sea Region and Danube Area. By encouraging the development of smart and connected places such co-operation contributes to regional growth and to the overall development and competitiveness of Europe in a globalised world.

There remain major differences between east and west in Europe. Scenarios up to 2050 show many regions, especially rural regions in Eastern Europe, facing significant problems related to their shrinking labour force and aging population. It will be increasingly difficult to sustain services of general interest in such regions unless new ways of provision can be developed. While Europe is aging and its population figures are expected to peak soon, Turkey and the neighbouring countries south of the Mediterranean Sea show opposite demographic trends. They have a young population which is expected to increase substantially over the coming decades. These diverging demographic trends affect employment structures and the foundation of our social systems, and they will pose new questions about immigration and cooperation across and beyond European borders.

At a very local level, accessibility to the nearest urban centre, good secondary networks and levels of service provision are important development factors. The Treaty on the Functioning of the EU (art. 174) mentions among others that some islands, mountainous and peripheral regions need particular attention. These types of regions actually comprise very different territories. For example, in the Alps there are major urban hubs as well as small mountainous villages with very poor access to basic services; the spectrum of European islands stretches from island states with a broad range of functions and services to islands with high dependence on tourism and poor connections to the mainland. Place-based policy making can make better use of the unique internal territorial diversity of such regions by applying a tailor-made mix of policies. However, some of these types of regions which are linked to territorial cohesion are characterised mainly by smallness and remoteness. Consequently they cannot easily gain the benefits of economies of scale, as limited accessibility restricts the size of internal markets.

Better understanding of the potential territorial impact of policies is vitally important for efficiency and cohesion. For example, even though currently planned improvements to transport networks will further enhance accessibility within Europe, serious congestion problems are likely by 2030, especially in the traditional core area of Europe. At the same time, improvements to internal accessibility in the eastern Europe are probably necessary to spread development benefits more widely.

Territorial impact assessment is an important evaluation tool for place-based policy making. Territorial impacts of EU sector policies show how far and where such policies contribute to delivery of territorial cohesion and economic development. At local or regional level, better coordinated EU sector policies have the potential to increase the competitiveness of an area. Techniques for doing territorial impact assessments being developed and tested within ESPON are a step towards supporting synergies and greater policy coherence.

### **Sustainable Europe**

External shocks are moderating thinking about regional economies. While competitiveness remains vitally important, new concepts are emerging: energy security, adaptation to climate change, regional resilience and capacity to bounce back.

A huge amount of Europe's fixed capital is invested in urban agglomerations. Such settlements are mainly on a coast or on the banks of great rivers that carry runoff from across a wide, often transnational water system. Climate change makes these urban areas in the north and west vulnerable to increased flood risks that could be extremely damaging in economic disruption, but also social and environmental terms. Urban areas are also at risk during spells of intense heat. There is a strong urban dimension to climate vulnerability, and a significant climate change dimension to Europe's future economic competitiveness.

Similarly in rural territories climate change would impact of traditional economic sectors such as agriculture, forestry and tourism. Some mountain areas may need to diversify away from snow-based winter tourism. Changes in biodiversity may also be expected and call for a new profiling of a region's natural and ecological assets. A longer growing season in some regions could enhance agricultural productivity and create opportunities for new crops and regional products and processing industries, such as wine-making in more northern regions than before. Along some coasts consequences of rising sea levels may raise concern and need preventive action.

Currently, energy policies are primarily shaped by national governments acting mainly in isolation from one another, and with little regard to regional variations in need or potential. Many of the areas with most to contribute to a resource efficient Europe, one of Europe 2020's Flagship Initiatives, have a peripheral location, and have often been seen by European and national policy-makers as places that are lagging compared to the core. Better regional knowledge and maps of untapped energy reserves are needed as a basis for developing longer-term plans. The "energy vulnerability" of regional economies however varies significantly across Europe. The main factors are the degree of energy efficiency in regional industries and the level of energy efficiency in the local housing sector.

To achieve a resource efficient Europe, integrated action is needed not just at the EU level, but also across macro-regions, and at national, regional and local level too. Europe's "green agenda" needs to be tuned to local specificities and its implementation must work with regional realities.

Well-intentioned EU policies can have unintended effects on regional assets related to landscapes, biodiversity and identity. For example, one unanticipated outcome of the Common Agricultural Policy has been a reduction in landscape diversity in several regions. These include northern regions in the Iberian Peninsula and, to lesser extent, southern ones also; the central and southern Adriatic coast in Italy, plus Calabria and Sicily; Thessaly and Kentriki Makedonia in Greece, as well as in many regions in south-eastern and central Poland.

Regions and cities need to be proactive towards external shocks and in delivering in relation to a greener economic development. Territorial analysis can underpin and inform a mindset of ensuring security for the economy and the citizens. It can help policy makers to take resilient decisions and create a policy mix that is right for the place. Territorial analysis implies “think global, act local and integrated” in the spirit of sustainable development. Such an approach informs business as well as public bodies.

### **Working together for competitiveness and cohesion**

Public policy makers at different administrative levels take decisions on the location of public activity. Many policy decisions also indirectly influence location decisions in the private sector. This makes a place-based approach important at all levels of government that seek to encourage business growth and attract new investment and at the same time create liveable places. Public policy with a territorial perspective can support many important factors of production. Communications infrastructure is an obvious example, whether it involves a local road improvement or international connectivity through a hub airport. Labour markets, skills and skill gaps have a territorial dimension. The quality of the regional and local environment is a crucial consideration for sectors such as health or tourism. Security of premises and other assets from the damaging effects of extreme weather events is another concern of businesses and citizens that is influenced by place-based public actions.

A territorial development strategy that is clear in its messages to investors as well as to local stakeholders can reduce uncertainty and risk and be part of the process of restoring business confidence and creating attractive places. However, such strategies are only useful if they are implemented effectively. For this, capability is needed at regional and local level. Such capability is currently not evenly spread across the ESPON space. Territorial cooperation can help spread know-how and share good practice. Regions good at governance and partnership are probably best placed in the process of recovery.

Today more than ever, regional and local strategies require an evidence base, key indicators and benchmarking against similar European territories. Territorial insights provided by ESPON can be important points of departure for stakeholders from the local to the national level, and in the private sector as well as in the public sector, to assess development potentials as well as challenges.

Last but not least, ESPON invites everybody to look at the project reports on which this ESPON report is based. They are available at [www.espon.eu](http://www.espon.eu). You are encouraged to use the material for your own work, to deepen and further develop it by adding detailed information about your own area, or discuss it with the ESPON community at one of the regular public events.

## Policy relevant key findings:

- The economic and financial crisis has hit European countries and regions asymmetrically. Some countries experienced a much higher rise in unemployment than others. Estonia, Lithuania, Latvia, Ireland and Slovenia all had roughly similar levels of unemployment in 2007 (around 5%), but Slovenia has experienced nothing like the deterioration that the others suffered. Within countries, regions with an economy highly dependent to a particular sector or company suffered more than others.
- Regions less reliant on export-oriented industries and financial services seem to have been less severely affected by the economic crisis that hit Europe in 2008.
- European cities and regions are strongly integrated in the global economy. More than half of the total global links between multi-national companies and their subsidiaries occur inside Europe, either inside a country or between two European countries.
- The decision-making centres of many multinational companies are located in London and Paris. Other capital cities and larger urban areas also host headquarters of multinational firms, as indeed do some rural regions, mainly in the core of Europe. In contrast, regions in Ireland, Wales, Northern England, Portugal, and Eastern Europe are dependent on subsidiaries of firms headquartered elsewhere.
- ESPON, with its focus on five geographical scales and the functional relations between them, provides evidence and ideas that can inform place-based actions to implement the economic recovery strategy set out in Europe 2020.

Europe 2020 sets out the road for economic recovery for the EU. Economic growth takes place in territories. The overall economic performance of Europe is the aggregate of a myriad of actions by firms scattered across the continent. In every case the firm will in part depend on territorial assets such as transport connections or the local labour force. The actions of public bodies set an important context for development and growth. For example, the Barca Report noted that crucial decisions about urban agglomerations are often made on the basis of very limited information about whether agglomerations are increasing or reducing efficiency, and should be encouraged or constrained. These are precisely the kind of decisions where ESPON in general, and this report in particular, should contribute to a richer and broader understanding. They matter at European level, but also at national and regional and local levels.

This ESPON Synthesis Report aims to contribute to an open process of learning and sharing. Glossing over conflicting priorities with the intention of securing consensus is a policy model likely to flounder at the implementation stage. With today's tight budgets EU citizens expect value for money. That means territorial policy and recovery strategies need to be integrated so that they pull in the same direction. While the macro-economic challenges are broadly common across Europe, place-based approaches are needed to connect and mobilise unique local assets.

### Box I. Place-based policy making

“A place-based policy is a long-term strategy aimed at tackling persistent underutilisation of potential and reducing persistent social exclusion in specific places through external interventions and multilevel governance. It promotes the supply of integrated goods and services tailored to contexts, and it triggers institutional changes.

In a place-based policy, public interventions rely on local knowledge and are verifiable and submitted to scrutiny, while linkages among places are taken into account. [...] this strategy is superior to alternative strategies that do not make explicit and accountable their territorial focus, or even hide it behind a screen of self-proclaimed space-blindness, fail to integrate services, and either assume that the State knows best or rely on the choices and guidance of a few private actors. The lessons of the recent crisis reinforce this argument.” Barca Report.

Sector policies and programmes that are not fully coordinated with other policy aims are an expensive luxury that Europe can no longer afford. Synergies between different policies are not fortuitous “icing on the cake”: they are essential building blocks to a better future. ESPON results can help connect Europe 2020 into regional realities and hard policy choices at all scales. This report seeks to start that process. Others will follow as more findings of ESPON research and analyses become available.

Europe’s revised Territorial Agenda is expected to be adopted in the first half of 2011. It will set out up-to-date territorial priorities and seek the dialogue with sector policies. Therefore it is an important adjunct to the Europe 2020 strategy, by defining the territorial dimensions of recovery from the economic downturn. ESPON findings are particularly relevant to the Member States and the Commission in developing the Territorial Agenda, which aims at strengthening the cooperation amongst EU ministers responsible for territorial cohesion and with the EU Commission.

The ESPON programme is a resource that can be used by policy makers at all levels. At EU level it provides evidence about regional development and disparities. This is an essential input to EU Cohesion Policy and effective use of Structural Funds. Action on territorial cohesion needs an understanding of Europe’s territorial structures, and in particular of the way that territorial assets can be mobilised, enhanced and sustained. ESPON’s research is an essential input to this process.

ESPON specialises in territorial data, research, analysis and scenarios. It supports policy making through applied research projects, covering 31 countries and more. It also undertakes targeted analysis, drilling down into detail in regions and providing concrete support on topics nominated by regional stakeholders.



### Box II. The ESPON 2013 Programme

The ESPON 2013 programme was adopted by the European Commission in November 2007 – as a programme under the European Territorial Cooperation Objective. It builds on the successful ESPON programme that ran from 2000-2006. ESPON's data and analysis covers all the EU members plus Iceland, Liechtenstein, Norway and Switzerland. Data is also compiled for the Western Balkans and Turkey, as far as possible. The ESPON data covers European regions and cities making it possible to see and compare developments at European scale. The research is conducted by transnational groups of researchers and experts, who are commissioned through open tendering.

The mission of the ESPON 2013 Programme is to: “Support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory by (1) providing comparable information, evidence, analyses and scenarios on territorial dynamics and (2) revealing territorial capital and potentials for development of regions and larger territories contributing to European competitiveness, territorial cooperation and a sustainable and balanced development”.

The actions in the programme are varied but strongly interrelated. They are:

- Applied research on themes of European territorial dynamics, providing scientific facts and evidence Europe-wide at the level of regions and cities. These results make it possible to assess strengths and weaknesses of individual regions and cities through European comparison and benchmarking.
- Targeted Analyses makes use of ESPON results in practice. Stakeholders identify local issues for research within a European perspective. ESPON provides a team of experts that carries through the analysis, working closely with the stakeholders themselves. Stakeholders then make use of the results to develop and implement policy.
- The Scientific Platform, that represents a core element in the knowledge base being created by ESPON. In particular the ESPON Database deals with territorial indicators and monitoring as well as tools related to territorial analyses, typologies, modelling and updates of statistics.
- Capitalisation of ESPON results, including the dissemination of the results through ESPON Seminars and Workshops, which are organised regularly. In addition, each ESPON country has its own ESPON Contact Point. Together these form a network that undertakes transnational dissemination and outreach to practitioners.

More information on the ESPON Programme can be found on [www.espon.eu](http://www.espon.eu).

Providing evidence that can support the making and implementation of policy for recovery, ESPON results can be interpreted at different geographical levels. This means that results can e.g. be discussed at global, European, macro-regional (transnational), national, regional and sub-regional levels.

Demographic change is fundamentally important to businesses and to policy makers at all scales. The maps of population growth show that in a global or neighbourhood perspective Europe had a rather modest population increase in the years 2001-2006, though in the eastern neighbourhood the figures are generally even lower. In contrast, growth figures in the southern neighbourhood are much higher. This has implications for policy at EU level on migration and on EU relations with its neighbourhood.

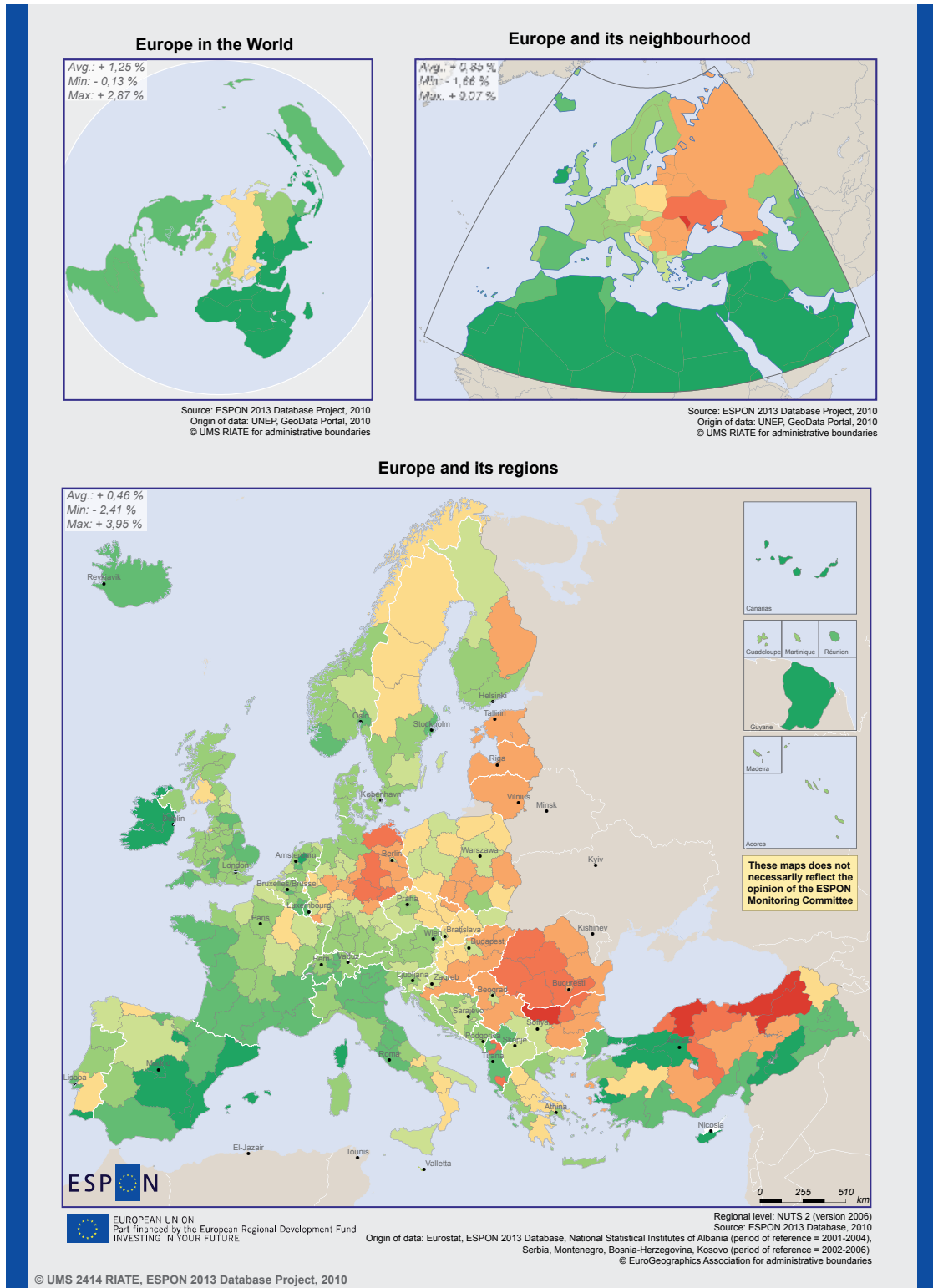
The European perspective – usually mapped at NUTS 2 and in some cases NUTS 3 level – offers a much more nuanced picture. For example, look at the difference between the core and the northern and eastern parts of the ESPON space. Regional policy makers are likely to be concerned with insights into differences between single regions, not least where regions adjacent to one another had notably different growth rates.

The macro-regional level offers an even more detailed insight, as in most cases it is mapped at NUTS 3 level and some cases even below. The map of the Danube area, shows that there are considerable differences between the north and south of that macro-region, but also between urban centres and their hinterland.

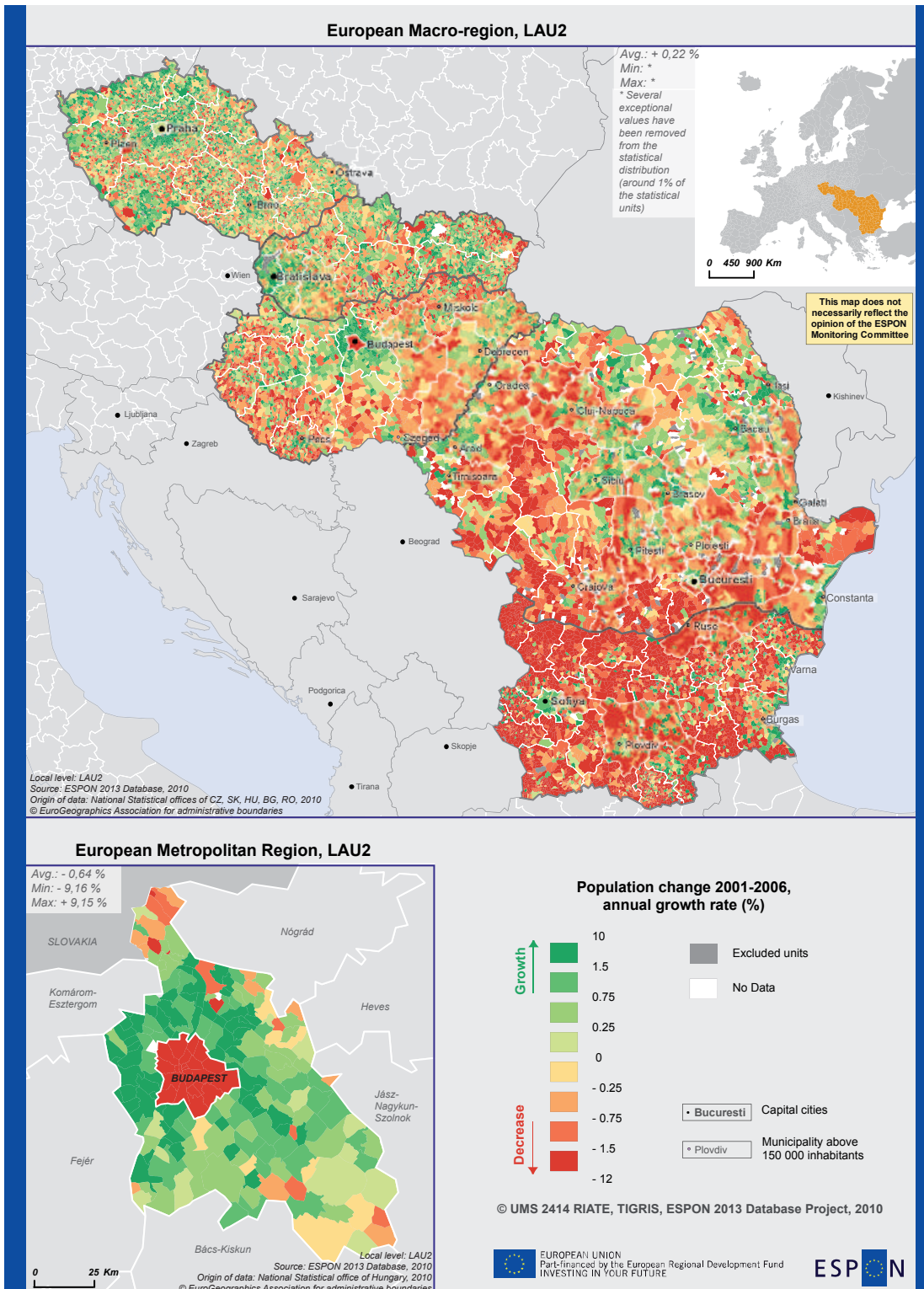
National figures are used in the worldwide and European neighbourhood analysis and allow for comparisons between countries within Europe and across a wide territorial context. For example, Ireland and Spain experienced strong population growth when compared to other European countries. National policy makers can learn how that was achieved, and what its territorial impacts were.

At a regional and local level – mapped at LAU 2 or 3 level – the maps show how a single region is classified in a European perspective, how it compares with its neighbouring regions or in a macro-regional or national perspective. In some cases the findings allow also for conclusions on the sub-regional level.

Map 1. Illustrating the Multi-Level Approach: The example of population growth, 2001-2006 (I)



Map 1. Illustrating the Multi-Level Approach: The example of population growth, 2001-2006 (II)



The report is based on studies carried out under the ESPON 2013 Programme that were available in summer 2010. These include studies on demographic developments, rural areas, climate change, cities, energy, and territorial impacts, as well as target analysis on agglomeration economies, territorial diversity, islands, convergence regions and spatial scenarios. As the programme continues to progress more applied research projects, targeted analysis and scientific platform results will be published in the period up to 2013. A full list of present and forthcoming studies can be found in the back of this report or on [www.espon.eu](http://www.espon.eu)

A feature of ESPON is that applied research and analyses works across five levels. This is now important for effective territorial policy making in a networked world. The levels are:

- Global, European neighbourhood
- European
- Macro-regional
- National
- Regional and local

ESPON's findings across a range of topics demonstrate just how diverse the cities and regions of Europe are, and show how to turn this diversity into a force for economic recovery and sustainable development. Therefore this report is structured to highlight territorial diversity with regard to:

- the economically strong, smart and connected places in Europe, which are perceived as drivers for the development (Chapter 2);
- cohesion and inclusion as a key territorial aim that needs to be part of the recovery strategy (Chapter 3); and
- the sustainability dimension of regional resilience and recovery, smart uses of the territorial assets, human and natural resources in order to not undermine the possibilities for future generations (Chapter 4).

Together these three aspects spell out the territorial dimension of the three growth paths outlined in Europe 2020: smart, inclusive and sustainable growth. Europe 2020. Smart growth means developing an economy based on knowledge and innovation. Sustainable growth is about promoting a more resource efficient, greener and more competitive economy. Inclusive growth sees Europe fostering a high-employment economy delivering economic, social and territorial cohesion.

The territorial approach shows that recovery does not mean a return to Europe as it was in 2007. ESPON encourages long term thinking about new economic opportunities and ways of strengthening European competitiveness. But it also points to an aging Europe in a world of energy and other resource shortages, greater risk of extreme weather and changing climates. It shows how cities are changing through metropolitanisation and new governance structures, while also noting the economic powers and market opportunities emerging in Asia and countries in the global south such as Brazil and South Africa.

Therefore, Chapter 5, the final chapter, invites policy makers and other readers to use the findings from ESPON and to shift their gaze to see across and between the five levels that shape a territorial approach to action.



**Box III. Selected characteristics of the ESPON space**

The ESPON space comprises 31 countries, i.e. Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lichtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and United Kingdom.

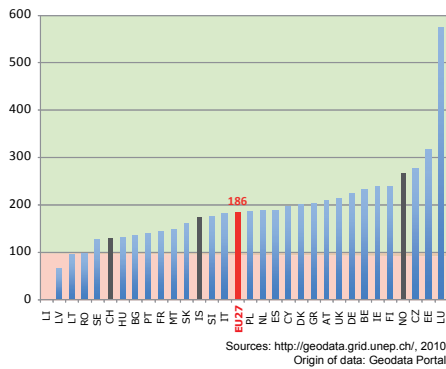
27% of the world's GDP is in the ESPON space, in 2005. The highest GDP per capita is in Liechtenstein and the lowest in Bulgaria.

14% of the world's CO2 emissions are produced in the ESPON space, in 2005, with Luxembourg having the highest (partly due to substantial petrol tourism) and Liechtenstein the lowest emissions per capita.

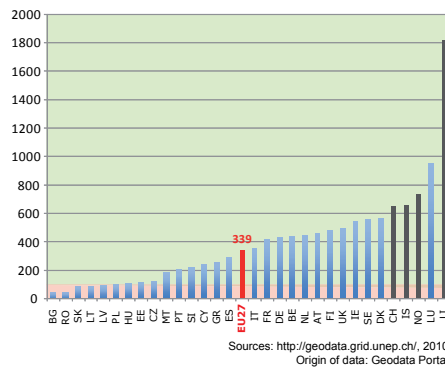
8% of the total world's population and 4% of the world's young world population (aged 0-14 years) live in the ESPON space, in 2005. In Iceland young people make up a higher share of the total population than in other countries of the ESPON space, and in Bulgaria for less than in any of the others.

12% of the world's urban areas are to be found in the ESPON space, whereas it only accounts of 4% of the global land surface, in 2005. In Malta urban areas make a larger share of the total area than in other countries of the ESPON space, while that ratio is lowest in Iceland.

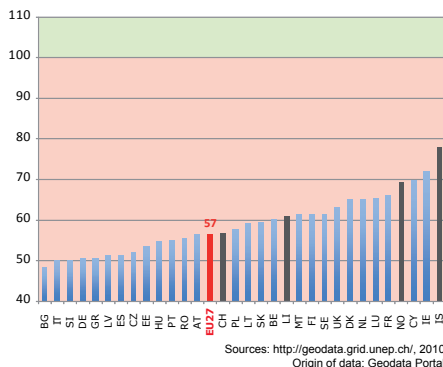
**CO2 emissions per capita, 2005**  
World = 100



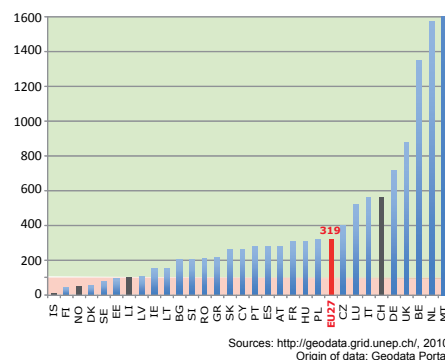
**GDP per capita, 2005**  
World = 100



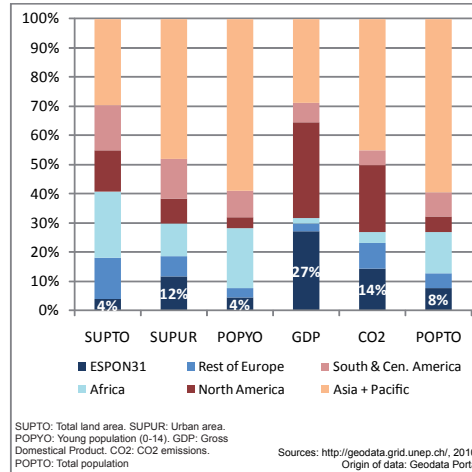
**Share of young population (0-14 years), 2005**  
World = 100



**Share of urban areas, 2005**  
World = 100



**Characteristics of ESPON in the World  
for 6 selected indicators, 2005**



### 1.1 How has the crisis affected unemployment across Europe?

Effective territorial policies are needed to make Europe more resilient in an uncertain world. The period leading up to 2008 and the onset of global financial and economic turbulence was marked by historic achievements within Europe. The EU grew to embrace 27 member states. A tariff-free market of half a billion people was created. The Euro was adopted by 16 countries. Europe's regions and businesses positioned themselves to operate in an increasingly globalising world. While expansion had widened the differences in living standards within the EU, territorial policies to create better balance and polycentric development were narrowing the gaps.

While all countries have suffered in the economic crisis, the impacts have been uneven. The Baltic States have been particularly hard hit by the rise in unemployment. So have Ireland, Iceland and Spain, three countries where a property boom which had seemed to offer economic growth, collapsed. In contrast, the two poorest EU countries, Bulgaria and Romania, have suffered less of a set-back in terms of unemployment than UK, Cyprus, Denmark or Sweden, for example. Similarly, Estonia, Lithuania, Latvia, Ireland and Slovenia all had roughly similar levels of unemployment in 2007 (around 5%) but Slovenia has experienced nothing like the deterioration that the others suffered.

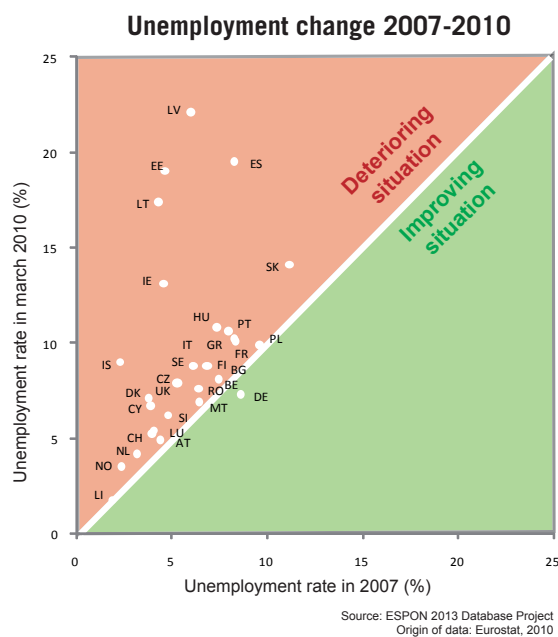
Macro-economic policies of national governments explain some of these variations. So too does the composition of national and regional economies. Europe's success in progressing towards unification simultaneously created new risks by opening up labour markets and service provision to forces beyond the traditional confines of the nation state.

## 1.2 The global context of competition

Europe remains a wealthy continent, the desired destination for many migrants from other parts of the globe. However, in the years since 2008 Europe has had to respond to the kind of “shocks” that seem likely to characterise the world in the decades ahead. Europe, its citizens and regions have had to adjust to changes that were not initiated by, or fully controllable by, the EU, member states or regional scale governments.

Therefore it is important to locate the Europe 2020 strategy in its global and historical context. Europe 2020 proposes that the EU should focus on high technology and knowledge economy industries, recognizing the growing power of emerging economies in low and medium levels of technology. Export trade flows are the most useful index to show how the world economies have changed over the past half-century. By measuring not only the total amount of exports but the structure by type of products, it is possible to show why and how relocation of industrial activity has taken place in the past and indicate a probable future path.

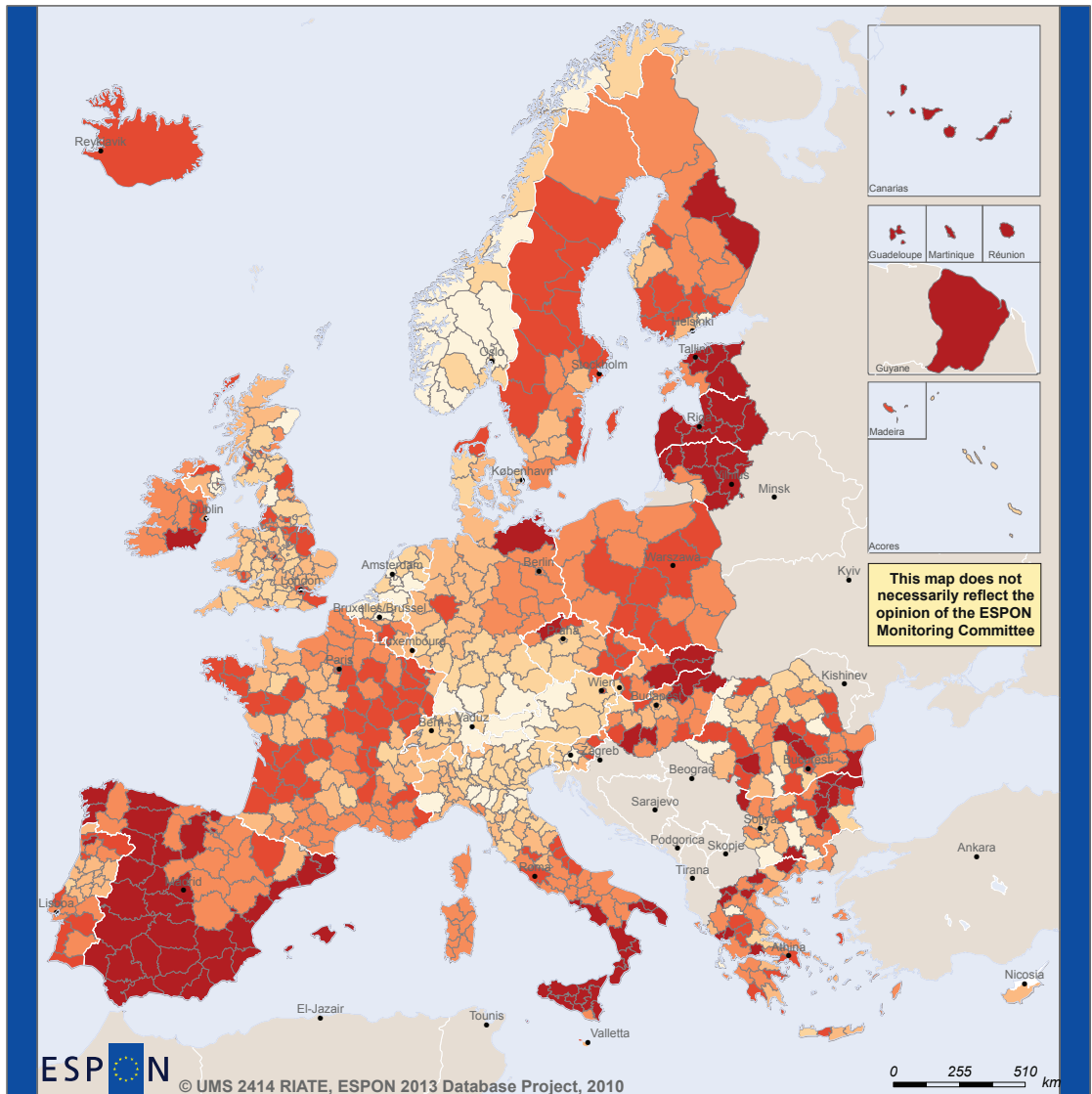
At the end of the 1960’s, the world was characterised by a clear distinction between a small number of countries with high technology (USA, Northwest Europe, Japan) and a majority of countries characterised by export of primary products. Very few countries belonged to the intermediate category of export of textile and electronics (Canada, India, East Central Europe).



The graph only looks at countries, not regions. It shows how unemployment changed between 2007 and 2010. While most countries are clustered as experiencing relatively modest deterioration, some have been much more badly hit, notably the Baltic republics but also Spain. In contrast Poland, Slovenia, Romania, Belgium, Malta, Austria and Liechtenstein have all performed favourably in this period compared with most European countries. Germany seems to be the only country where the employment situation improved from 2007-2010.

The map shows unemployment rates in Europe in March 2010, estimated on the basis of national sources. Most of Europe’s regions have unemployment rates of over 6%. Rates up to 10% are common, but there are regions where the rates are much higher. The darkest green band spans a range from just over 15% to almost 50%

Map 2. Unemployment in Europe, March 2010



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Regional level: NUTS 2-3 (version 2006)  
Source: ESPON 2013 Database Project (Regional values 2007 adjusted NUTS0 in March 2010)  
Origin of data: ESPON 2013 Database Project; 2009; Eurostat, 2010; Secrétariat d'Etat à l'économie suisse, 2010; Statistics Iceland, 2010; Landesverwaltung Liechtenstein, 2010  
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Looking at the pattern, Europe seems to be gripped by high unemployment zones in the east, south and west. The “U” shape of highest unemployment areas runs from Sweden and Finland through the Baltic States and Eastern Europe, taking in the Eastern Germany (though with a lot of regional variation in Bulgaria and Romania), then through Greece and southern Italy (though avoiding Cyprus and Malta) and back north through Spain and Portugal, France, Wallonia and Ireland. Inside this “horseshoe” are countries that have fared less badly so far. Overall unemployment seems to vary primarily by country: however there are some significant intra-country variations too.

By the middle of the 1980's, this picture had changed. There were fewer economies heavily tied to agriculture exports, but many more based on energy exports following the escalation in global energy prices in the 1970s. However, many countries with energy or mineral resources simply exported their resources, rather than building their industrial sector. On the other hand, some countries with fewer natural resources and big emerging countries (Brazil, China, India) started to develop their industry, firstly in textile industry and later in electronics branches.

By the beginning of the 21st century, there was a growing difference between the extended group of countries that mainly export energy or mineral resources, and the group of industrialized countries which is increasingly made up of newly developing countries. The industrial cores of the 1960's are now clearly in competition with new industrial economies that are also moving towards higher technological sectors. These new industrial countries are taking an increasing share of world trade and more and more they are exchanging together, and not necessary with the former centres of the world's industrial economy.

There is an interesting difference between EU27 and Japan or USA. In Asia as in America, the process of industrialization has spread toward neighbouring countries such as Mexico, Brazil, China, India, and Korea. Some of these neighbouring countries are today competitive global players. Even if these countries are competitors, they are also regional partners and support the growth of old cores.

In Europe the EU has integrated new member states into its economy: it has become stronger itself instead of seeing neighbours developing into new global players. At the same time, there are growing international players in the neighbourhood of the EU, notably Russia, Turkey, Tunisia, and Morocco.

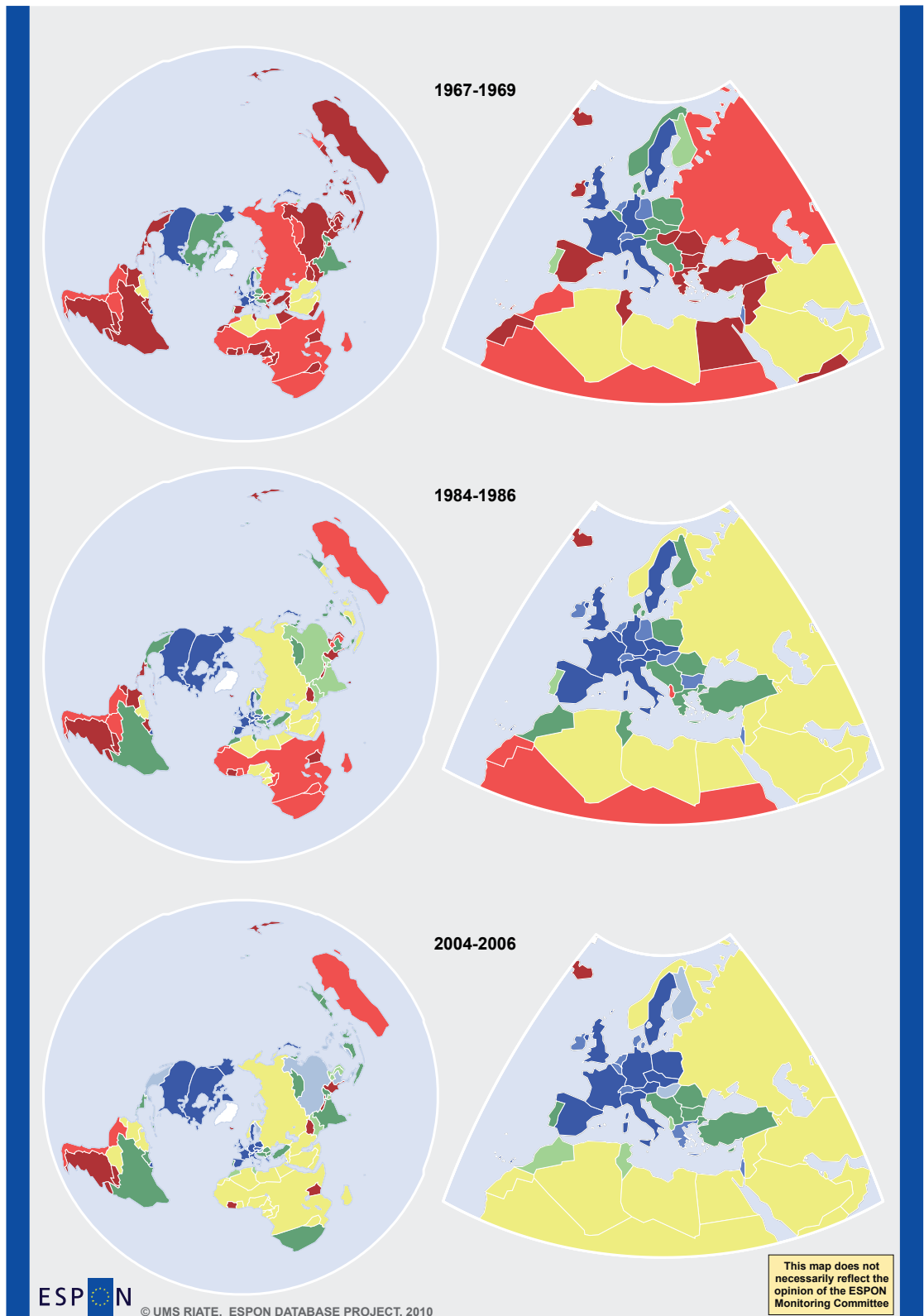
However, an outer ring of countries still have low levels of industrialisation that export mainly energy or primary products. This is true both to the east (Russia, Central Asia) and south (Africa). This specific situation is a real challenge for the EU because this area is not really integrated by industrial links.

Instead it is subject to influence of other centres from anywhere in the world who are looking for energy and primary resources. China, for example, is securing many contracts to gain long-term access to Africa's mineral wealth. Thus a smart growth strategy for the EU needs to look at territorial relationships and balance competitiveness and resilience, the short-term and the longer perspective.

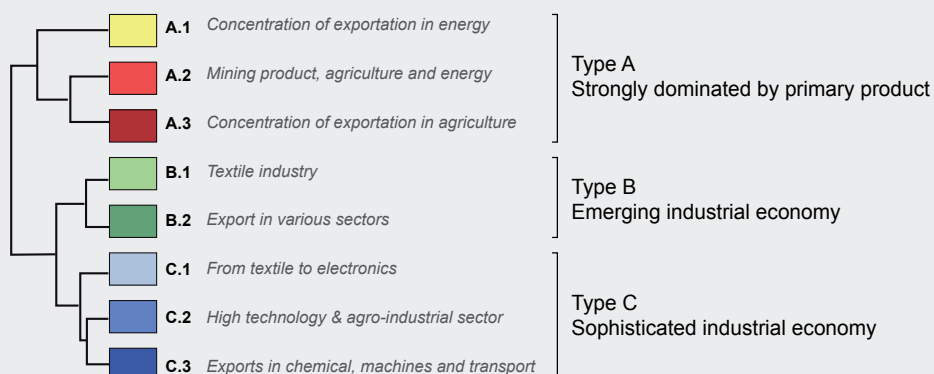
Europe's cities and metropolitan regions are strongly placed in the global economy. More than half of the total global links between multi-national companies and their subsidiaries occur inside Europe, either inside each country or between two European countries. This high proportion is explained by Europe's history of individual nation states. It means that the European industrial system is much more complex than the Asiatic or the North American ones. Faced with globalisation, strong networks have developed between the numerous European cities, from the smallest ones to the biggest metropolises.



Map 3. Typologies of countries' profiles for trade exports, 1967-2006



**Legend: Typology of countries' profiles for trade exports, 2004-2006**



	ENE	MIN	AGR	TEX	ELE	CHE	MAC	TRA
<b>A.1</b>	76%	6%	9%	4%	1%	3%	1%	1%
<b>A.2</b>	12%	42%	34%	5%	1%	3%	2%	1%
<b>A.3</b>	9%	8%	67%	9%	1%	4%	2%	1%
<b>B.1</b>	4%	5%	15%	58%	7%	5%	4%	1%
<b>B.2</b>	8%	17%	20%	24%	9%	8%	9%	7%
<b>C.2</b>	8%	5%	5%	14%	41%	9%	11%	7%
<b>C.2</b>	5%	8%	17%	12%	13%	23%	18%	4%
<b>C.3</b>	4%	10%	9%	14%	13%	12%	19%	17%

**Typology of products (derived from CHELEM)**

- (1) ENERGY (ENE) : Coals (IA), Crude oil (IB), Natural gas (IC), Coke (IG), Refined petroleum products (IH), Electricity (II)
- (2) MINERAL AND SEMI-PRODUCT (MIN) : Cement (BA), Ceramics (BB), Glass (BC), Iron Steel (CA), Tubes (CB), Non ferrous metals (CC), Iron ores (HA), Non ferrous ores (HB), Unprocessed minerals n.e.s. (HC)
- (3) AGRICULTURE AND FOOD (AGR) : Cereals (JA), Other edible agricultural prod (JB), Non-edible agricultural prod. (JC), Cereal products (KA), Fats (KB), Meat (KC), Preserved meat/fish (KD), Preserved fruits (KE), Sugar (KF), Animal food (KG), Beverages (KH), Manufactured tobaccos (KI)
- (4) TEXTILE AND CLOTHES (TEX) : Yarns fabrics (DA), Clothing (DB), Knitwear (DC), Carpets (DD), Leather (DE), Wood articles (EA), Furniture (EB), Paper (EC), Printing (ED), Miscellaneous manuf. articles (EE)
- (5) ELECTRIC & ELECTRONICS (ELE) : Electronic components (FL), Consumer electronics (FM), Telecommunications equipment (FN), Computer equipment (FO), Domestic electrical appliances (FP), Electrical equipment (FQ), Electrical apparatus (FR)
- (6) MACHINES & EQUIPMENTS (MAC) : Miscellaneous hardware (FB), Engines (FC), Agricultural equipment (FD), Machine tools (FE), Construction equipment (FF), Specialized machines (FG), Arms (FH), Precision instruments (FI), Clockmaking (FJ), Optics (FK)
- (7) TRANSPORT (TRA) : Vehicles components (FS), Cars and cycles (FT), Commercial vehicles (FU), Ships (FV), Aeronautics (FW)
- (8) CHEMICALS & BIOTECHNOLOGY (CHE) : Basic inorganic chemicals (GA), Fertilizers (GB), Basic organic chemicals (GC), Paints (GD), Toiletries (GE), Pharmaceuticals (GF), Plastics (GG), Plastic articles (GH), Rubber articles (incl. tyres) (GI)
- (9) MISCELLANEOUS (MIS) : Jewellery, works of art (NA), Non-monetary gold (NB), N.e.s. products (NV)



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The maps are built from data for 82 countries or aggregates of countries. Exports are classed into 8 broad groups of products and the changing composition of a country's exports is analysed. Statistical techniques are then used to group similar countries. The result is that the maps show when a country moved from one type of export composition to a different one. Overall the findings picked out 3 types and 8 sub-categories.

- Type A is characteristic of countries where exports are strongly dominated by primary products. Such economies are vulnerable to fluctuations in world commodity prices, and so are likely to experience highs and lows. Countries with a concentration of their exports in the energy sector (A.1) or in agriculture (A.3) are the most vulnerable to this price effect as the value of commodities boom or slump on world markets. Countries combining mining products with agriculture and energy (A.2) are less vulnerable, since if one sector slumps the other sector may still command good world prices. .
- Type B is characteristic of emerging industrial economies that focus on sectors with a low technological level. Countries without energy or mining resources typically develop a textile industry (B.1) as a first step to industrialisation. Countries with more natural resources can develop a more balanced pattern with exports in various sectors (B.2).
- Type C indicates more sophisticated industrial economies, which can jump from textiles to electronics (C.1) but also achieve full development of high technology with increasing exports in chemicals, machines and transport industries (C.3). In some cases, countries can combine high technology with an important agro-industrial sector (C.2).

The development of the EU fostered re-organisations and takeovers to enable companies to develop a critical mass to compete at European and global levels. This is especially evident in London and the UK. In London 64% of the subsidiaries are locally controlled, which means they are owned by enterprises that are themselves headquartered in London. The figure is even higher in cities in the north of England such as Leeds (75%) or Middlesbrough, a town based on chemicals (84%).

Such high levels of local dependency are sustainable as long as the local headquarters companies are thriving. Even in difficult times, the friction associated with relocation of international headquarters means that these regions may still be less vulnerable than city regions relying on subsidiaries controlled from elsewhere. This latter situation applies strongly in Northern Ireland, Ireland, Eastern Europe and many of the provincial city regions of Spain and France.

London is a financial centre of global significance. This could be interpreted as a very positive effect. A deep and complex set of economic linkages suggests multiple mechanisms through which to adapt to an external shock. There are also the benefits from the spill-overs of knowledge and ideas that drive innovations and are associated with big urban economies. This contrasts with the situation in Eastern Europe. There city regions have been catching up by increasing the complexity of their productive system through welcoming foreign subsidiaries, together with recent emergence of local enterprises. However, openness, interconnectivity and subsidiaries carry the risk of a domino effect in hard times, when shocks from outside can undermine local economies less able to influence their own fate. As Europe seeks to recover from the economic crisis there is a need to capture the opportunities of local and global connectivity while managing the risks.

The territorial dimension focuses on the idea of balanced and polycentric growth. This means in principle that no territorial concentration of economic assets should become too dominant in the European / national / regional economy as a whole. However, the clear message from the analysis of urban agglomerations and the competitive advantages they offer is that the inherent dynamism of the market economy works towards precisely such concentrations.

Regional development policies and EU Cohesion Policy therefore need to practice appropriate forms of intervention that can target territorial development opportunities and threats. As well as thinking about regional competitiveness and being attractive for investments, important as that remains, it is also prudent to consider regional risks, vulnerability and to design structures and mechanisms to create resilience. These are likely to include continuous diversification of the economic base, reducing drain from the local economy and positive policies for entrepreneurialism to stimulate and sustain the growth of local businesses.

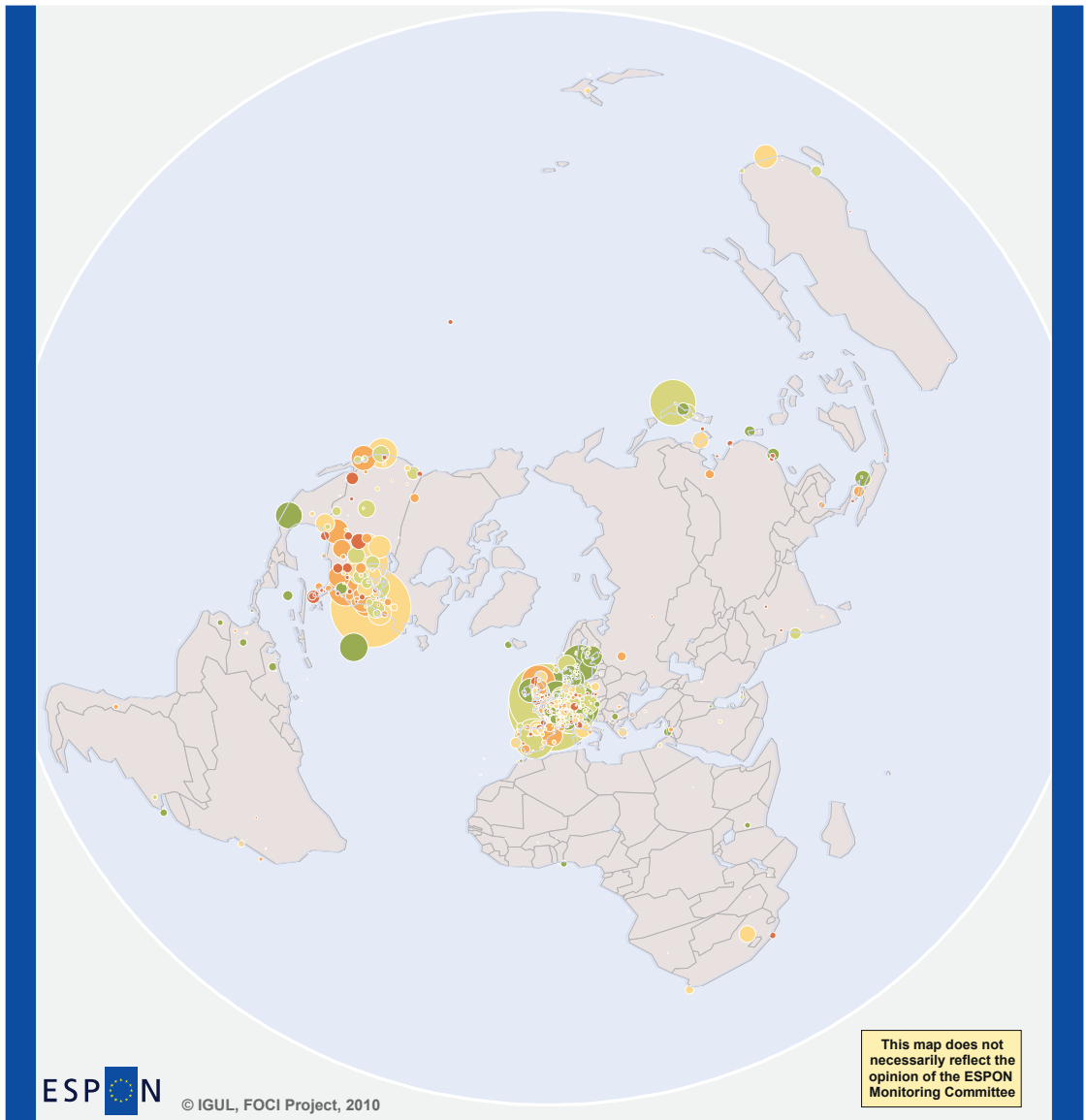
While construction can be a means of quick injection of investment into an economy, it is important that the construction is linked to long term infrastructure assets that will sustain growth and reduce environmental risks. An approach is needed that is both strategic and integrated so as to ensure that benefits of such investments are maximised and capitalised by interventions well tuned to the territorial assets of the city and region.

The following maps show a hierarchy of metropolitan regions based on locations of multinational corporations and their subsidiaries.

The world map excludes local links where the owner and its subsidiaries are in the same metropolitan area. So this is a map of where international power over economic decisions lies. Europe is one of three global regions with significant concentrations of enterprises able to determine the fate of their subsidiaries. The other two are USA and East Asia. The degree of territorial concentration is more marked in Europe. Nevertheless, the colours show that in Europe the foreign subsidiaries make up a lower proportion of all subsidiaries than in California, the US east coast or the main Asian hubs. Japan and the US are countries which house control functions over many firms.

The map on page 28 looks at the balance between subsidiaries controlled from a city and subsidiaries in that city but controlled from elsewhere. Places able to dominate are in shades of brown, while cities whose economy is characterised by subsidiary firms owned elsewhere are shown in green. London and Paris stand out in the sheer number of subsidiaries that they control elsewhere (shown by the size of the circles). Note the relatively dominant position (darker green shades) enjoyed by some relatively small border cities such as Geneva, Basel, Trieste and Arnhem. Other small, regional cities that have long been the headquarters base for global companies can be picked out – Lausanne / Nestle and Clermont Ferrand / Michelin. In contrast city regions in Ireland, Wales, Northern England, Portugal and eastern Europe look very dependent on subsidiaries.

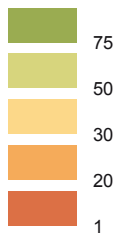
Map 4. Networks of multinational firms by Metropolitan Area, 1986-2006



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Source: Rozenblat, IGUL, Lausanne, 2010  
Origin of data: ORBIS, BVD 2007  
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Control of foreign subsidiaries, 1986-2006\*  
(in % of the total number of controlled subsidiaries, excepted the local controls)

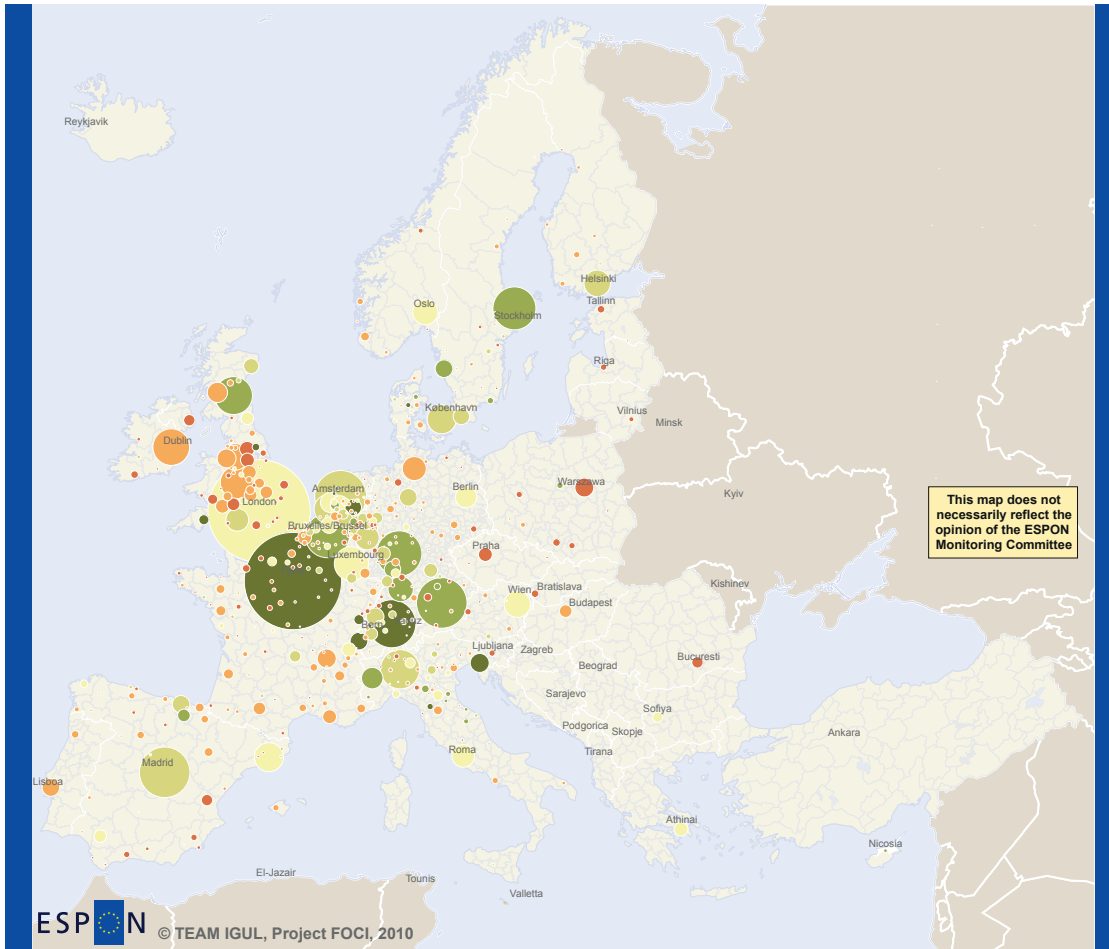


Total number of controlled subsidiaries (excepted the local controls) by metropolitan area



\* in the sample of the 600.000 direct or indirect subsidiaries in the world of the first 3.000 first worldwide multinational firms

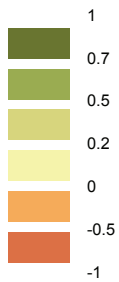
**Map 5. Balance of internal and external subsidiaries by Functional Urban Area, 1986-2006**



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Level: FUA  
Source: Rozenblat, IGUL, Lausanne, 2010  
Origin of data: ORBIS, BVD 2007  
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Controlled subsidiaries - subsidiaries from outside  
Controlled subsidiaries + subsidiaries from outside



Controlled subsidiaries + subsidiaries from outside\* by FUA (except local links)



\* in the sample of the 600.000 direct or indirect subsidiaries in the world of the first 3.000 first worldwide multinational firms

## 1.3 Territorial Cohesion

In Europe's development, competitiveness and cohesion are seen as complementary aims and territorial cohesion is both an end and a means. Inclusive growth encompasses not just economic and social cohesion, but also territorial cohesion. The Treaty on the Functioning of the EU said the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions (Article 174). Similarly the Territorial Agenda elaborated in 2007 through intergovernmental cooperation of the EU Member States stresses that territorial cohesion is a pre-requisite for achieving sustainable economic growth and implementing social and economic cohesion. This will be further emphasised in the revised Territorial Agenda to be presented in 2011.

In 2006 The Council adopted the Community Strategic Guidelines. These stated that “promotion of Territorial Cohesion should be part of the effort to ensure that all of Europe's territory has the opportunity to contribute to the jobs and growth agenda.” Similarly, the Community Strategic Guidelines on Rural Development highlight the contribution which EU rural development programmes can make to pursuing territorial cohesion. The economic conditions in 2010 make these sentiments even more important. Strength through diversity underpins the idea of territorial cohesion. It is not only recovery that is sought, but a more balanced and harmonious development path.

“More balanced and sustainable development, implicit in the notion of territorial cohesion, would achieve a more even and sustainable use of assets, bringing economic gains from less congestion and reduced pressure on costs, with benefits for both the environment and the quality of life.” Green Paper on Territorial Cohesion.

The Green Paper on Territorial Cohesion scoped three challenges where action was needed. These were characterised as “Concentration, Connection and Co-operation”. Concentration is about overcoming development challenges caused by differences in density. Europe is characterised by having many small and medium-sized towns besides larger urban agglomerations, rural and peripheral areas. Indeed this pattern underpins the quality of life for many citizens. In large parts of Europe town dwellers are not far from the countryside, which often includes high quality landscapes or other attractive opportunities for recreation. In turn, rural residents are able to enjoy the services and job opportunities of the cities. Development of functional regions strengthens these links.

Connection is fundamental in today's globalized world. Good transport links are a basic building block for territorial cohesion, overcoming the barriers of distance between regions. However, connection today means being on essential networks: broadband internet access; mobile phone coverage; knowledge networks linking universities, research centres and businesses across the globe; networks able to deliver secure supplies of energy when and where it is needed. Through every stage of their life cycle people need to be able to access the services of general interest – education, health, affordable housing, post offices, for example – that are an important part of cohesive and inclusive living in a shared territory.

As the Green Paper noted, “The problems of connectivity and concentration can only be effectively addressed with strong cooperation at various levels”. Rivers in flood do not stop at administrative boundaries; fish do not carry passports as they move through Europe's seas; volcanic ash can create havoc across airspace hundreds of kilometres away from its point of origin. Sometimes the level for effective co-operation will be between adjacent local authorities, even if they are either side of a national boundary. Sometimes it will be between the EU and countries from the Neighbourhood. The fundamental point is that co-operation is a midwife for territorial cohesion, and an essential tool for European recovery and resilience. It can create new efficiencies in delivery of services of general interest while also improving access to services and jobs for people. For enterprises it can increase the size of the labour market and create opportunities to access local suppliers and markets.



Territorial cohesion is also about grappling with Europe's geography and history. The continent is basically a huge peninsula, with a long coastline, plenty of offshore islands (some large, some small) and several mountain ranges. European development through history has led to the territorial structures that we know today. One of Europe's most important territorial structures is the European urban system with cities of different sizes and functionality that are hotspots of economic growth. Infrastructure networks provide accessibility and connectivity of places, with service levels often reflecting the volume of people present.

Although a European core is a reality, many jobs and people are in the river valleys and close to the coast in the more climatically favoured parts of the land mass. There are maritime borders on the west, north and south, while to the east there is land border that imposes its own barriers to commerce and the movement of people.

The islands and many border regions face problems of accessibility, limited markets, and higher costs for services and energy, a phenomenon both at national and European scale. Loss of biodiversity is becoming a general problem for all territories, while economic over-dependence on tourism is a typical feature of mountainous regions.

In some sparsely populated regions the challenge may be to sustain the basis of settlement itself in the face of out-migration and aging. Yet all these diverse regions are part of the whole that is Europe, and have their own distinctive contribution to make to the processes of growth, recovery and cohesion. A development strategy has to be tailored to local assets and institutions. Territorial data and analysis is fundamental to this process.

### 1.4 The territorial dimension in Europe 2020

Europe 2020 makes several references to the importance of territorial cohesion. Its seven Flagship initiatives in support of a smart, sustainable and inclusive growth for Europe are:

- Innovation Union;
- Youth on the move;
- A digital agenda for Europe;
- Resource efficient Europe;
- An industrial policy for a globalised era;
- An agenda for new skills and jobs;
- European platform against poverty.

A territorial dimension and a place-based approach is integral to the implementation of the strategy. The aims of Europe 2020 require that territorial diversity is acknowledged and that full advantage is taken of the distinctiveness of Europe's regions and municipalities. A territorial dimension is also needed to fully grasp the different types of challenges for regional development of the Europe 2020 strategy. Last but not least, acknowledging the territorial dimension and its richness also allows for better inclusion of the key public and private stakeholders at local and regional level. ESPON is an important resource for the Territorial Agenda, the development of territorial cohesion policy and the realisation of the Europe 2020 strategy.

## 2 – Polycentric Europe: smart, connected places

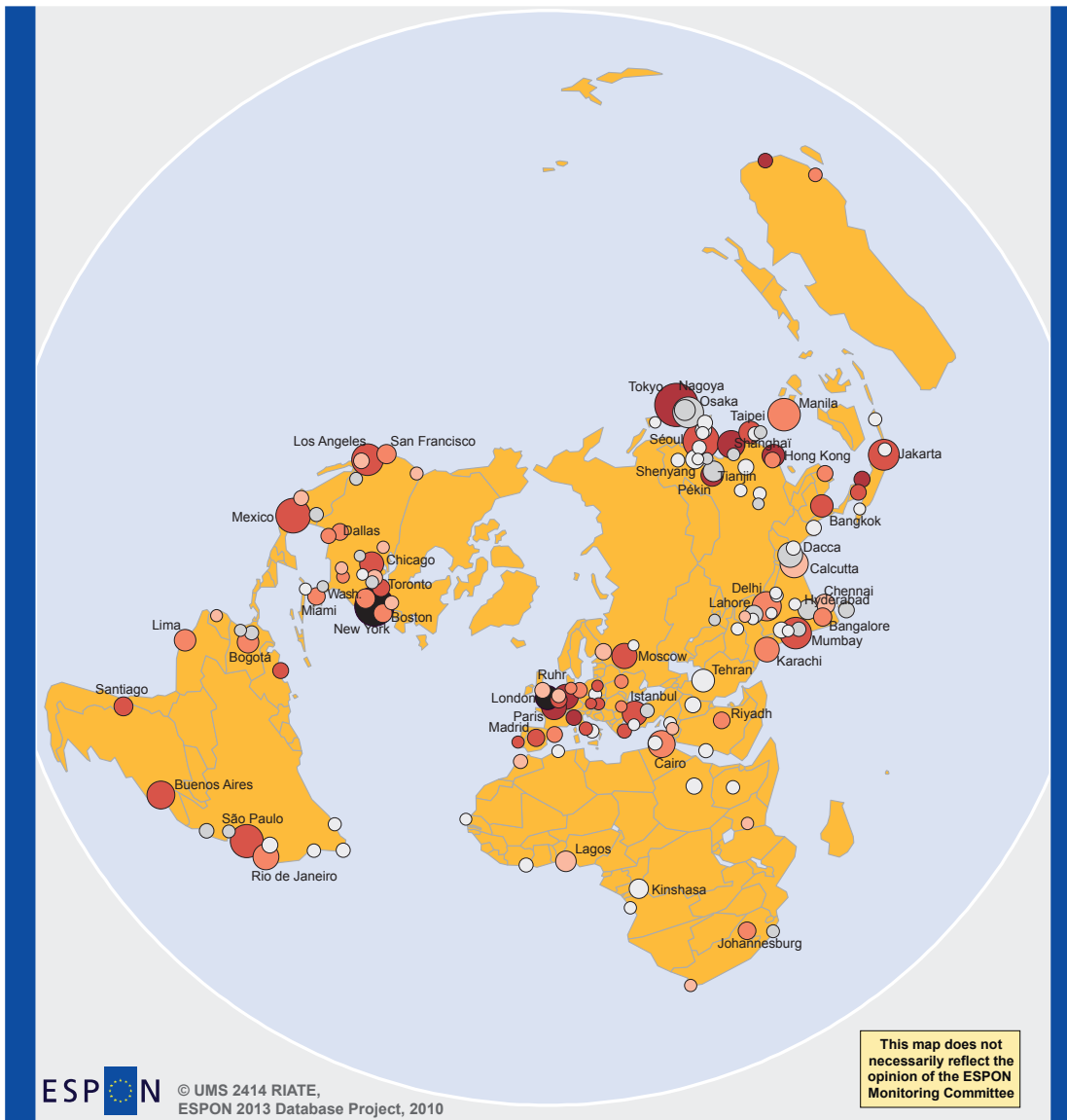
### Policy relevant key findings:

- At European scale, more can be done to stimulate decisions towards a polycentric Europe with stronger integration and better connection of European metropolitan places outside the core area of Europe.
- Nano-, bio-, information-technology and cognitive sciences are expected to drive future innovation waves. The locations and networks of this important sector, mainly in Europe's capitals and university cities, will become increasingly influential in the European urban system.
- Networks within transport, energy, business etc. are important development catalysts. Connection to functional networks can strengthen the development potential of places – in particular those outside the European core area. Accessibility and competitiveness often goes hand in hand.
- Places that can be reached for day-return business trips have an advantage in today's economy. The network of such places in Europe shows a clear centre-periphery pattern. Air is the prime transport mode for inter-metropolitan business trips. The national orientations of rail networks make high-speed less attractive than it could be for cross-border travel.
- Smart, connected places are not only urban. A wide range of rural areas belong to this group. Some benefit from high accessibility to urban centres, but some others combine unique local products or assets with high direct as well as virtual connectivity into the global economy.
- Many urban centres close to national borders have the potential to co-operate and so develop larger functional areas. The degree of cross-border integration differs substantially.
- Territorial impact assessments can provide important evidence about how and where sector policies will influence regional development. This can improve the coordination and synergies of public policies. Development of regions to increase their resilience is dependent on a smart policy mix involving various sector policies as well as policies at different scales - European, national, regional and even local level.

Global networks can be reached from virtually any place in the ESPON space. However, Europe's big cities are main gateways to the world. They are the transport hubs, the nodes in the global financial systems or the locus of research institutes in cutting-edge and international innovation networks. These are some of the smart places. Despite the rise of the internet, various types of physical connectivity remain and will remain of fundamental importance. Energy, water and transport are still the essential basis for regional development. Smart regions enjoy good, region-wide connections to these, but also plan for a future where energy is expensive, water less reliable, and transport links difficult to fund and maintain.

Europe 2020 identifies "smart growth" as a key component of economic recovery and development. It equates smart growth with "an economy based on knowledge and innovation". To achieve smart growth Europe will need smart places. Smart places attract people and firms from a wider area, even from outside Europe. Knowledge and innovation are key development factors in today's world. They are the ingredients of smart regional economic growth, and strategies for recovery from the economic and financial crisis. In a world that has become more networked, connectedness is more and more important. Thus a set of territorial factors, such as linkages, urbanisation advantages, attractive environments and co-operation in the processes of territorial governance, have become vital economic resources.

Map 6. World City Network, 2008



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Sources: Population - Moriconi-Ebrard F., 2001, *De Babylone à Tokyo*, Ophrys  
World cities classification - Taylor et al., 2010, *Measuring the World City Network: New Results and Developments*  
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City's integration into the world city network in 2008

- London and New York, clearly more integrated than all other cities
- Other highly integrated cities
- Very important world cities that link major economic regions and states into the world economy
- Important world cities that are instrumental in linking their region or state into the world economy
- World cities linking smaller regions or states into the world economy, or important world cities whose major global capacity is not in advanced producer services
- Cities that have sufficient services so as not to be overtly dependent on world cities (smaller capital cities, and traditional centres of manufacturing regions)
- Other cities

Classification of cities based upon their level of advanced producer services.  
Global service centres are identified and graded for accountancy, advertising, banking/finance and law

Population of Urban Areas  
(million of inhabitants in 2000)



The map shows global cities with regard to the number of people living in the urban area and integration into global business networks. The classification is based on the presence of advanced services in an urban area. For this purpose the locations of the 100 largest global service producing enterprises within six different branches (accountancy, advertising, banking/finance, insurance, law, and management consultancy) were charted. Using data from around the year 2000, the number of such offices within the extended ESPON space amounted to 2 548. Although it is just one indicator, the presence of the largest global service producing enterprises provides a good proxy on the global standing of a location.

Within Europe, London, Paris, and the Rhine-Ruhr area stand out as large and highly integrated metropolitan areas. They are followed by Madrid and some other capital cities. In the direct neighbourhood, Istanbul and Moscow are notable metropolitan areas which are not only of considerable size but also well integrated into the global business networks.

Smart and connected places are not necessarily all urban. Indeed, there are successful rural areas which are able to benefit from globalisation, because of their particular development assets and good links to other parts of the global economy.

### 2.1 Growth potentials in urban areas

An area's economic growth is still strongly influenced by the state of the national economy. Nevertheless, the evidence points to cities outperforming their national economies and theories of the advantages of agglomeration economies can explain why this is the case. There is a general process of concentration of wealth in the biggest cities, especially in Eastern Europe. However, this metropolitanisation trend was stronger in the 1990s than at present.

#### Box IV. Agglomeration advantages - Proximity of activities as a success factor

The success of urban areas and regions is influenced by the composition of the actors present in an area. Three factors in particular can be highlighted:

- Close proximity of private companies with similar profiles. “Localisation economies” refer to the advantages accruing to private companies because of location in an area where companies with similar profiles are in close proximity. This explanation underlies the idea of industrial districts or clusters.
- Close proximity of private companies with trading links. “Activity-complex economies” refer to the advantages that accrue to companies because of the close location of different types of activities which have substantial trading links.
- Close proximity of private companies with unrelated activities. “Urbanisation economies” refer to the range of advantages that accrue to companies because of their shared urban location with different and unrelated activities. Urbanisation economies tend to increase with the size of the urban concentration, and are typically advantages in access to ideas and other “soft” business assets.

Urban areas are generally doing better than non-urban areas because of the advantages that derive from the proximity of private actors - strengthening the competitiveness and economic performance of those firms. Whereas this may explain why in general metropolitan regions have development advantages, it does not explain the diversity of development paths and future potentials.

Regions and urban areas in Europe have different socio-economic profiles. Accordingly, the hot-spots of development vary depending on the economic activities in focus. Hotspots also change over time, as different economic activities become key factors of economic growth and competitiveness and the utilisation of development potentials of areas changes. For a territorial development strategy it is necessary to look not just at the patterns inherited from the past, but at what is likely to be the leading future technologies and where those sectors might grow.

There is diversity not just between regions but within regions, and a new regional economic geography can be identified. In general, the highest rates of economic growth – as measured by employment change – are found in relatively high value service sector activities at the core of conurbations. Some older manufacturing industries tend to survive in pockets of smaller urban centres on the metropolitan periphery. Higher manufacturing activity and some of the more routine service sector activities tend to cluster around key transport infrastructures, often on the fringe of the urban core.

### **Box V. Agglomeration advantages and territorial development patterns - The case of Manchester**

The Manchester conurbation is one of the major European urban areas, with key functions of European importance in various fields, including university research, service provision and transport. This urban region is an important secondary city within the UK. In the last decade it has strengthened its position in the national urban hierarchy.

Global economic development trends have impacted on the economic development of Greater Manchester in two ways. The urban region tends to be functionally divided between a growing core and south, and a northern part in decline. The challenge is now to find a governance model that is able to enable the unemployed in the north to benefit from the dynamics in the core and in the south

Within the region of Manchester, employment change figures show clear territorial patterns. High employment growth (1998-2008) could be observed in the regional centre and around Manchester's international airport at the southern tip of the conurbation. This reflects the functional division of the region with a concentration of financial and professional services in these areas, and also engineering jobs especially near the airport. Agglomeration advantages appear to accrue to service sector firms operating within the core of the conurbation and, to a lesser extent, near the airport. An important part of the regional development strategy is the fostering of a Media City cluster close to the core in the regenerated dock area now called Salford Quays.

Clustering of high value activity in these locations has resulted in the decentralisation or independent growth of lower value activity in more peripheral locations. Furthermore, the housing preferences of the high skilled labour force play a role in the development of specific locations: apartments for young professionals in the downtown core and family housing around the attractive villages and small towns particularly to the south of the conurbation.

The northern part on the other hand still suffers as from the early 1990s decline of manufacturing (measured in value added and employment). Due to globalization regional production systems have become less important. Important parts of the old production chains have been outsourced to other parts of Europe and the world. Also some new nodes of activity appear where less attractive economic activities that have been pushed out the city by the rising service sector come together.

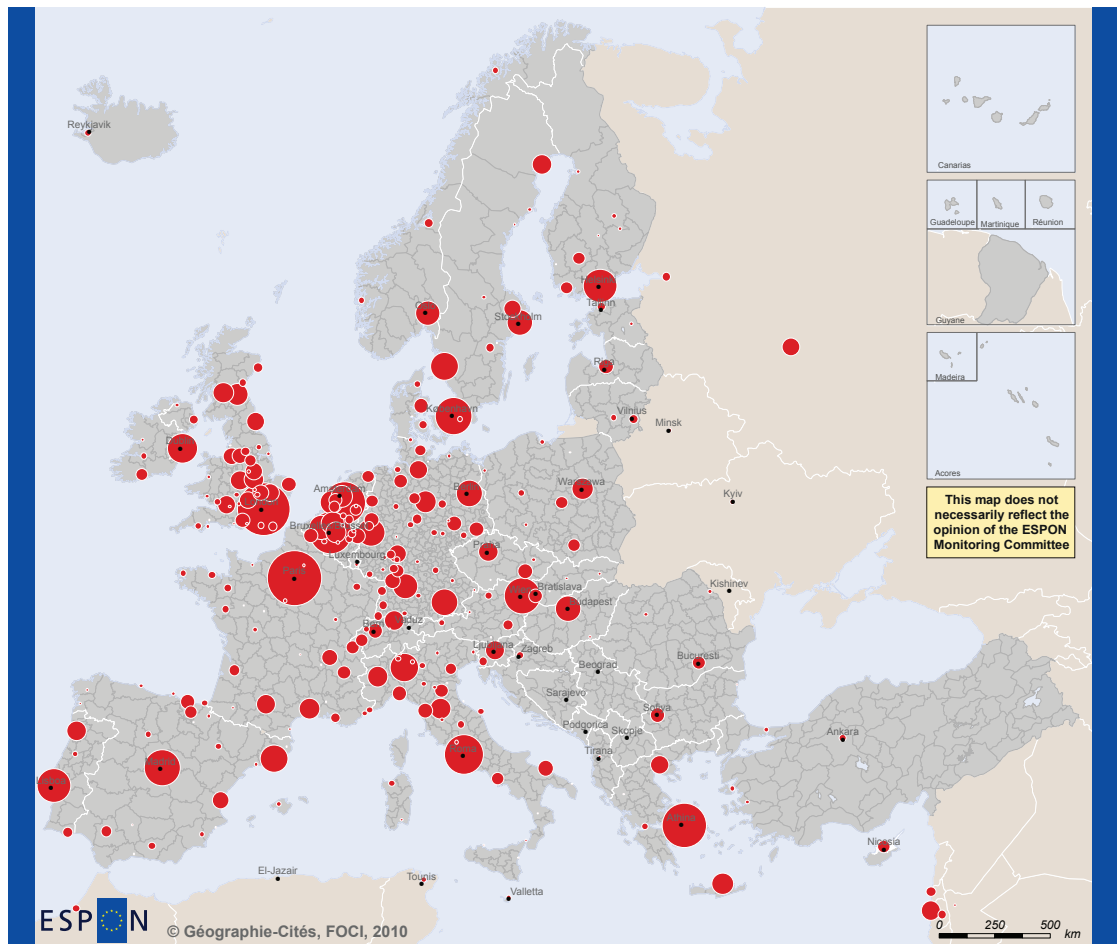
### **Potential future urban hotspots**

Technological innovation has acquired an increasing strategic importance for economic competitiveness, and so for Europe's positioning in a globalised world. It also plays a crucial role in the structuring dynamics of the settlement patterns. Within the knowledge economy, the evolution of urban systems seems to be significantly shaped by competition in the fields of knowledge and innovation.

"NBIC" stands for nanotechnology, biotechnology, information technology and cognitive science (also referred to as "converging technologies"). These sectors are expected to drive the next innovation wave which is expected to emerge by 2020. Accordingly, the location of NBIC centres may influence the future path of the European urban system.

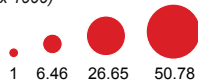
Paris and London, and more generally European national capital cities, have strategic positions within specific networks. These are places then with potential capacity to control the circulation of knowledge spill-overs that flow between European cities.

Map 7. Centrality within NBIC networks, 1986-2006



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**Betweenness centrality scores**  
measure of the centrality of a vertex within a graph  
(x 1000)



Source: ESPON Database, 2010  
Origin of data: combination of several FP programmes  
between 1986 and 2006; CORDIS website, 2009  
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The map presents a first picture on how well actors in different European urban areas are integrated into scientific and technological networks dedicated to NBIC. NBIC stands for nanotechnology, biotechnology, information technology and cognitive science. “Betweenness Centrality” measures the potential intermediary role of cities within a network: the more a node occurs on many shortest paths between other nodes, the higher is its “betweenness centrality”.

The pattern is clearly polycentric and not entirely determined by city size. National capitals in general seem to be strong centres, but there are other players far from the capitals, notably in the north of Sweden. There are what looks at European scale like clusters in England, Scotland, Belgium, Netherlands, Germany, Switzerland, Italy, Denmark, Sweden and Finland. At national level, the pattern in France, Greece, Norway, Cyprus and the smaller states in Eastern Europe are quite monocentric with capital cities in a dominant national position. The very limited representation in Estonia, Lithuania, Slovakia and Malta may mean that these countries are at risk of missing out on NBIC development.

Furthermore, there are two geographical patterns of the NBIC networks:

- The major centres are the largest European capitals and economic centres. Their role is to integrate almost all other European cities within networks that accompany the diffusion of knowledge and know-how.
- Other major centres with specific profiles regarding the knowledge economy appear as specialised nodes that could anchor further technological developments, since the next economic cycle is likely to be strongly associated with research activities. Examples for this are the urban regions of Barcelona, Glasgow, Edinburgh, Gothenburg, Hannover, Stuttgart, Munich or Milan.

The picture confirms that two main generic processes structure urban systems today. There is hierarchical differentiation, including metropolitanisation, but also a process of specialisation by some cities. The implications for policy are that if NBIC does indeed prove to be the driving force for economic and regional development it is likely to reinforce the dominance of the capital cities, especially in smaller countries. The risk is that part of the price of economic recovery will be a widening development gap between the capitals and rural regions in particular. Bulgaria, Romania, Slovakia and the Baltic States appear to be at risk of being left behind in these rapidly developing sectors. There is a case for a concerted effort in those countries to connect better to these networks. Regional co-operation may help: Finland, for example, is more strongly placed in these networks than might be expected for a country of its size. Poland and Hungary may be useful models for others to look at.

### 2.2 Gateways, polycentric development and accessibility

The high population density of the European core and the short distances between major urban areas in that part of Europe are an economic asset. It creates large labour markets and consumer markets and confers on a trans-national scale some of the urbanisation advantages of agglomeration economies. It has almost certainly facilitated some of the company strategies of mergers and consolidation to increase their European and global competitiveness that were discussed in Chapter 1. The ability to connect quickly and reliably with suppliers, clients and customers is vital in today's just-in-time economy. This can be measured in various ways, but the concept of potential accessibility is a very useful indicator. It shows how many people can be reached from a region weighted by the time needed to reach them.

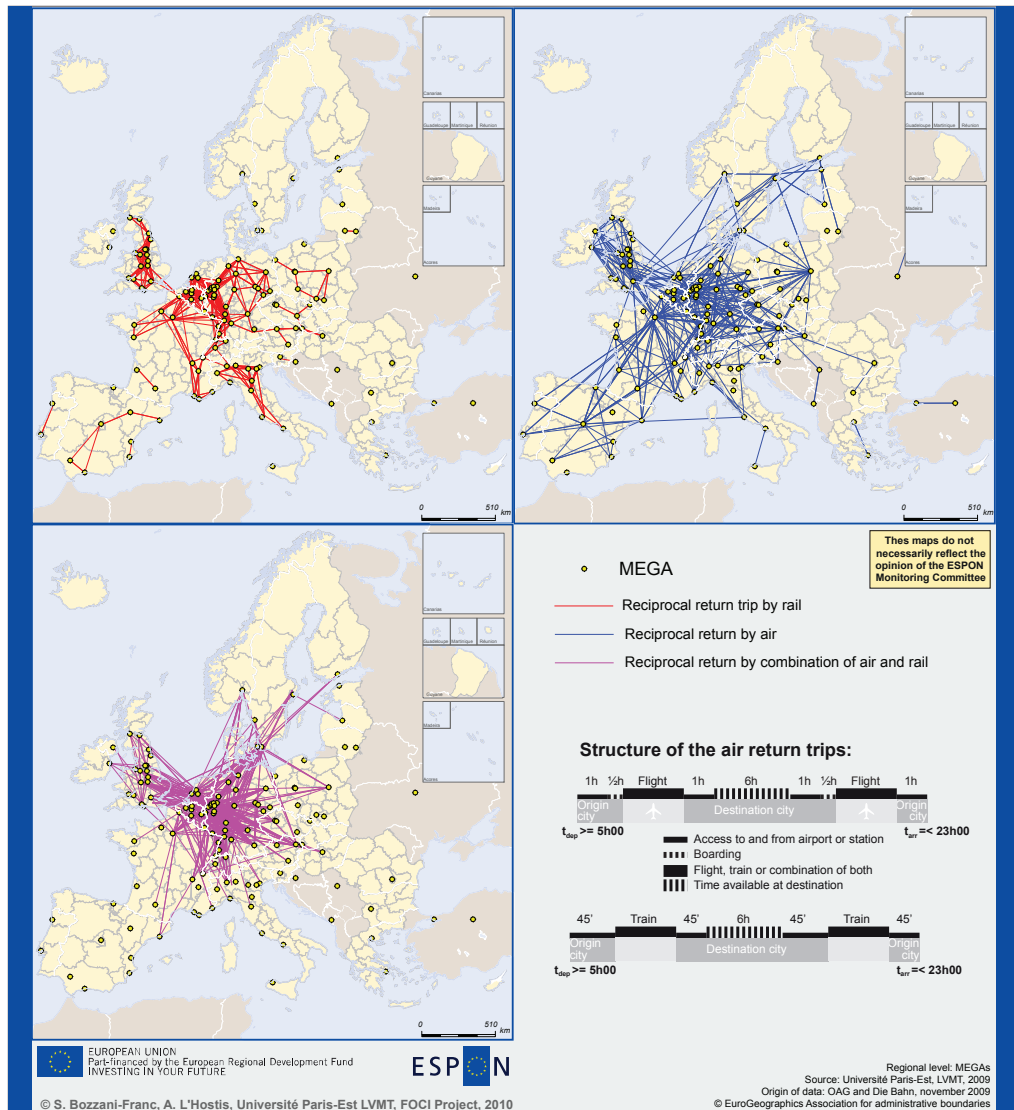
#### Web of one-day trip locations

Despite the growth of the internet and the capacity for conducting business through communications mechanisms like conference calls and internet telephony, face to face meetings remain an important business practice. They are particularly good for situations where trust and confidence has to be built and if brainstorming or co-operative working are priorities. Furthermore, the time of senior staff is expensive; few can be spared from their office for an extended period. In such situations especially there is a premium on locations that can be reached in a trip that can be contained to a single day, i.e. leaving early morning and being back home in the late evening.

The possibilities for one-day business trips, based on actual travel times and allowing for at least 6 hours at the destination, show clearly the European core-periphery pattern as well as the importance of rail for inter-metropolitan relations. The overall pattern shows a high level of integration within the European core, including also large parts of the UK. The Iberian peninsula is linked to the core, and also the links between the core and eastern countries like Poland and Hungary are clearly visible, but in all these cases the intensity is much lower than what can be seen inside the core. In other words there are fewer flights and less choice for business persons from those parts of Europe. The possibilities for one-day trips from or to Estonia, Latvia, Lithuania, Romania, Bulgaria, Greece, and Turkey do not exist. Of course this pattern is no surprise: distance remains a barrier and crossing it takes resources of time and money. As the theory of agglomeration economies explains, proximity does indeed confer some relative advantages.



Map 8. City network for one-day business trips, 2009



The maps show the possibilities for one-day business trips from selected urban regions. A one-day business trip means having at least 6 hours available at the destination while leaving home after 5 a.m. and being back home before 11 p.m. on the same day. The transport modes considered are rail, air or a combination of rail and air, based on actual timetables.

The rail connections highlight the importance to national inter-urban connections within some countries, for example, Italy, Spain, Portugal and the UK. However in much of the European core, rail also provides a viable international business option as shown by the density of red lines linking cities in Germany, France and Benelux. The connectivity by a combination of rail and air is shown in pink. It is of particular importance for metropolitan regions on the fringe of the core of Europe, such as the Øresundregion, various major cities in the UK, or Prague. The map with blue lines, showing air links, reveal the huge dependence of peripheral Europe on its air links for international connections. The Iberian peninsula, Scandinavia, the Baltic States, Ireland and Northern Ireland and also Sicily are only able to connect to the core through an airport. There are some key hubs evident for such countries: Madrid, Copenhagen, Warsaw, Rome in particular. In more peripheral countries and regions day return business trips to foreign cities are simply not possible.

Thinking in terms of regional resilience and capacity to ride out external shocks three quite different “Europes” can be seen on the map. In the core there is plenty of redundancy built into the system. There is a choice between rail and air and the sheer number of options means that even if services were cut back there would still be some that could be accessed. At the other extreme are the very peripheral areas not connected at all, or with minimal connectivity. Their development strategies are usually not tied to day-return business trips, so their economies are not as vulnerable to shocks affecting the day-trip business.

The most vulnerable regions are those in the third category, those in-between the core and the periphery. These are places that have some connectivity but it is limited and dependent on a few air connections whose disruption or cost escalation (through rising oil prices or fiscal policies seeking to help Europe reach its emissions targets) could mean that businesses from them cannot reach partners in other countries, and that businesses located in the core would no longer be able to reach these more peripheral urban centres and get back home the same day. This precarious dependence on a few connections is a theme that a territorial strategy for building resilience would address.

Rail is very important for national inter-metropolitan relations. Trains are able to compete with planes for a large set of proximity relations. However, the map shows also the strong national logic of (high-speed) railway systems, providing first class links between cities located in the same country but being less useful for cross-border contacts. For instance, the high-speed railway link between Naples and Milan opened recently allows for an integration of the national urban network via rail – nevertheless Italian cross-border links rely mostly on air travel.

Furthermore the map shows that the combination of rail and air plays a decisive role in the integration of the networks. Several major urban areas such as Lille, and the agglomeration areas along the Rhine and Ruhr benefit from high levels of accessibility by the combination of high-speed and classical rail and good airport connections. For such arrangements to work more widely high quality integration between the transport modes – in terms of hubs and also timetables- is necessary.

Despite the importance of the rail network, for most metropolitan areas, air is the main transport mode for inter-metropolitan links. However, those metropolitan areas that do not possess a strong international airport, do not necessarily have poor accessibility levels. It is possible to build high levels of inter-metropolitan accessibility without relying only on airports.

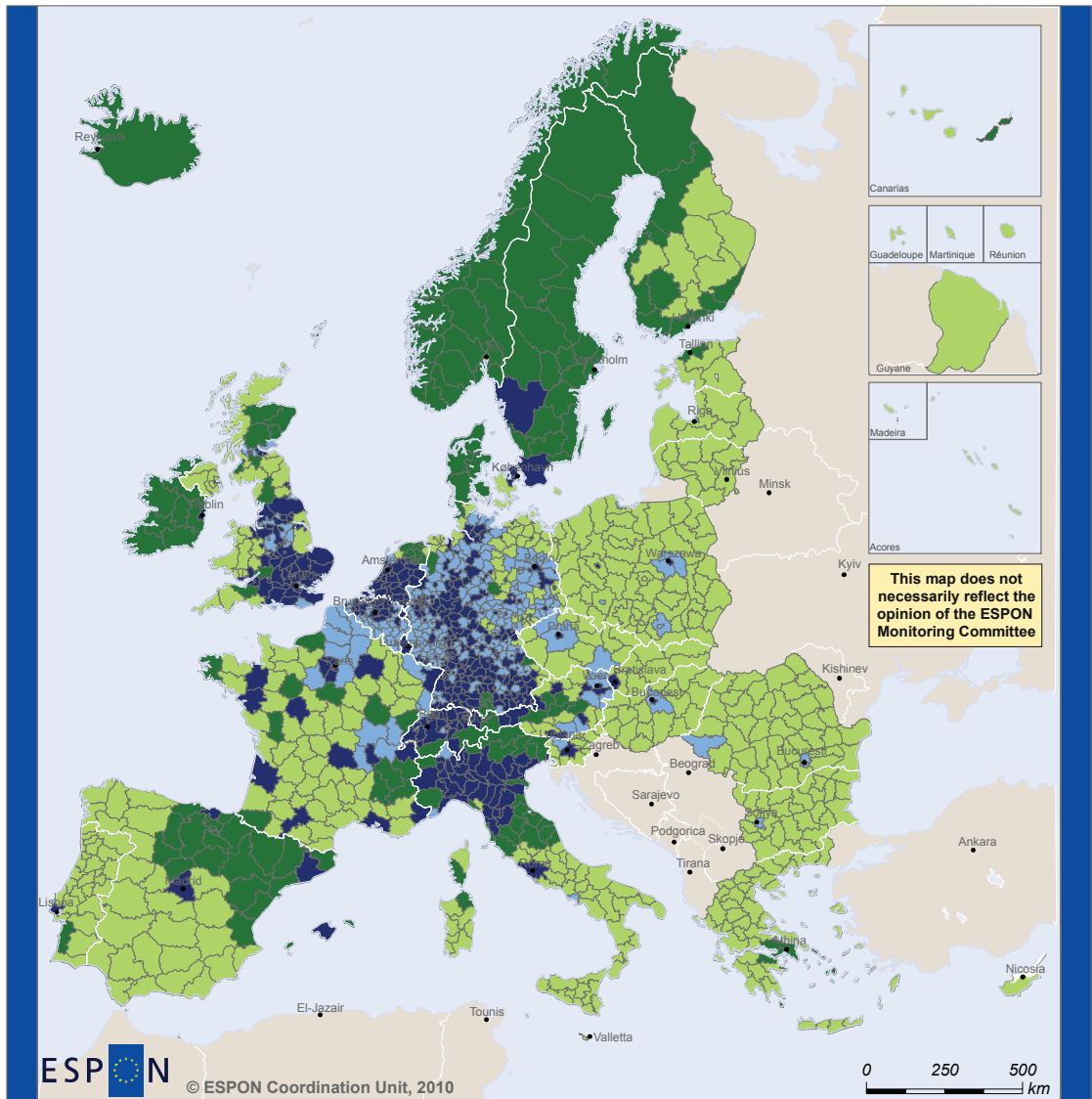
### **Accessibility as a factor in economic development**

In European policies good transport infrastructure is a key to regional development. The degree to which the potential to reach people in other areas of the ESPON space is important for a region's economic performance has been tested by cross-analysing ESPON accessibility data and GDP.

Accessibility describes how easily people in one region can reach people in other regions. It shows how well a region is connected to potential markets and cooperation partners in other parts of Europe. Regions with better accessibility to raw materials, suppliers and markets enjoy generally more competitive market positions.

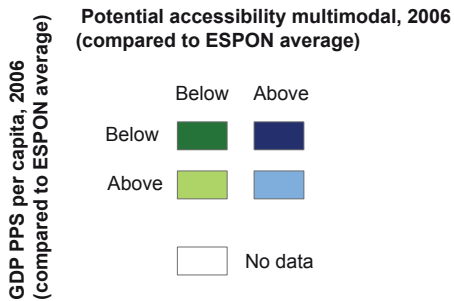
The map shows the relation between multimodal accessibility and economic development in 2006. In relation to potential accessibility and GDP per capita in PPS, 69% of the regions are in a double positive or double negative situation, i.e. have both GDP and accessibility above, or both below, European average. The link between those two factors is also underlined by a correlation analysis. However, the analysis shows also that accessibility is not the only factor explaining the economic development of a region.

Map 9. GDP per capita versus potential multimodal accessibility, 2006



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Regional level: NUTS 3  
Source: ESPON 2013 Database  
Origin of data: Eurostat, 2006 (GDP); S&W Accessibility model (Accessibility)  
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### Box VI. Understanding potential multimodal accessibility

Potential accessibility describes how easily people in one region can reach people located in other regions. Within the accessibility model used by ESPON, potential accessibility is based on two elements: (a) population in NUTS 3 regions, and (b) effort in time to reach them.

The accessibility model measures the minimum travel time between all NUTS 3 regions for rail, road and air separately. For multimodal accessibility they are integrated into one indicator expressing the combined effects for these modes for each NUTS 3 region.

The potential accessibility of a NUTS 3 region is calculated by summing up the population in all other European regions, weighted by the travel time to go there. In order to avoid “edge” effects, European regions outside the territory covered by ESPON (e.g. St. Petersburg) are also included in this calculation.

About a third of the ESPON space has both above average GDP and above average accessibility. These are often larger urban agglomerations which serve as transport hubs for a larger area. The map shows that these areas are mainly located in the core of Europe. Most capital city regions, and a wide range of urban regions in France and Northern England are characterised by average performance with regard to both indicators. Usually these regions are surrounded by regions with below average GDP per capita. This may be seen as an indicator that the surrounding regions dispose underused potentials which could be exploited in order to increase their economic welfare. Vicinity to neighbouring regions with high GDP could be a development opportunity as well.

Perhaps most interesting of all are the economically successful regions with below average accessibility. Often they are sparsely populated and remote. They can be found in the Nordic Countries, north-east of Spain, Scotland, Ireland and in and around northern Italy. Apparently, accessibility is not a decisive factor for the economic development of these regions. Regions in the Nordic Countries, for example, have overcome their peripheral location by capitalising on current strengths in relation to ICT, research, educational and environmental opportunities and less on improving their accessibility.

### 2.3 Connected rural regions

Smart rural or remote areas often have a level of connectivity which is not fully displayed in accessibility maps. There are two very different forms of connectivity in rural and remote areas. Firstly, there is the connectivity to the nearest urban centre. This gives access to services and hub functions. Secondly, some rural areas have well developed global connections and are well integrated into global flows. This is often closely tied to a particular characteristic of the rural area, such as a tourist attraction or a worldwide branded local product. In such situations effective regulation of development is an important part of smart growth. It ensures that long-term assets are protected from short-term exploitation.

Another important type of proximity is the one between neighbouring regions. Co-operation between adjacent rural regions can enhance their position, for example in marketing their assets or accessing urban services.

Urban areas and their hinterland are today not two discrete spaces; they overlap and interlink in a complex system of economic and social interactions. Examples are commuting, service provision, leisure and recreation activities. These linkages result in development patterns which underlie trends and changes over time. Urbanisation, counter-urbanisation and commuting are key drivers in rural-urban development. As a result of these flows, many accessible rural areas are well integrated into a wider functional urban area, with the advantages this brings in terms of access to jobs and higher order services

Rural-urban linkages within a functional region can support the overall economic development of the rural hinterland. However, there are also situations where the urban area grows but leaves the rural hinterland behind. People leave the countryside for the city, services are rationalised and concentrated, and villages cease to be fully viable. The risk of such an internal divergence appears to be particularly strong in areas with fast economic growth. At the same time it is also linked to different phases of urbanisation, sub-urbanisation and re-urbanisation processes which vary between the European countries.

### **Connected smart rural areas**

For rural and small remote places good accessibility to the nearest centre is a vital development factor. The presence of effective rural-urban transport links and cooperation involving the public, private and voluntary sectors has potentially great significance for rural development.

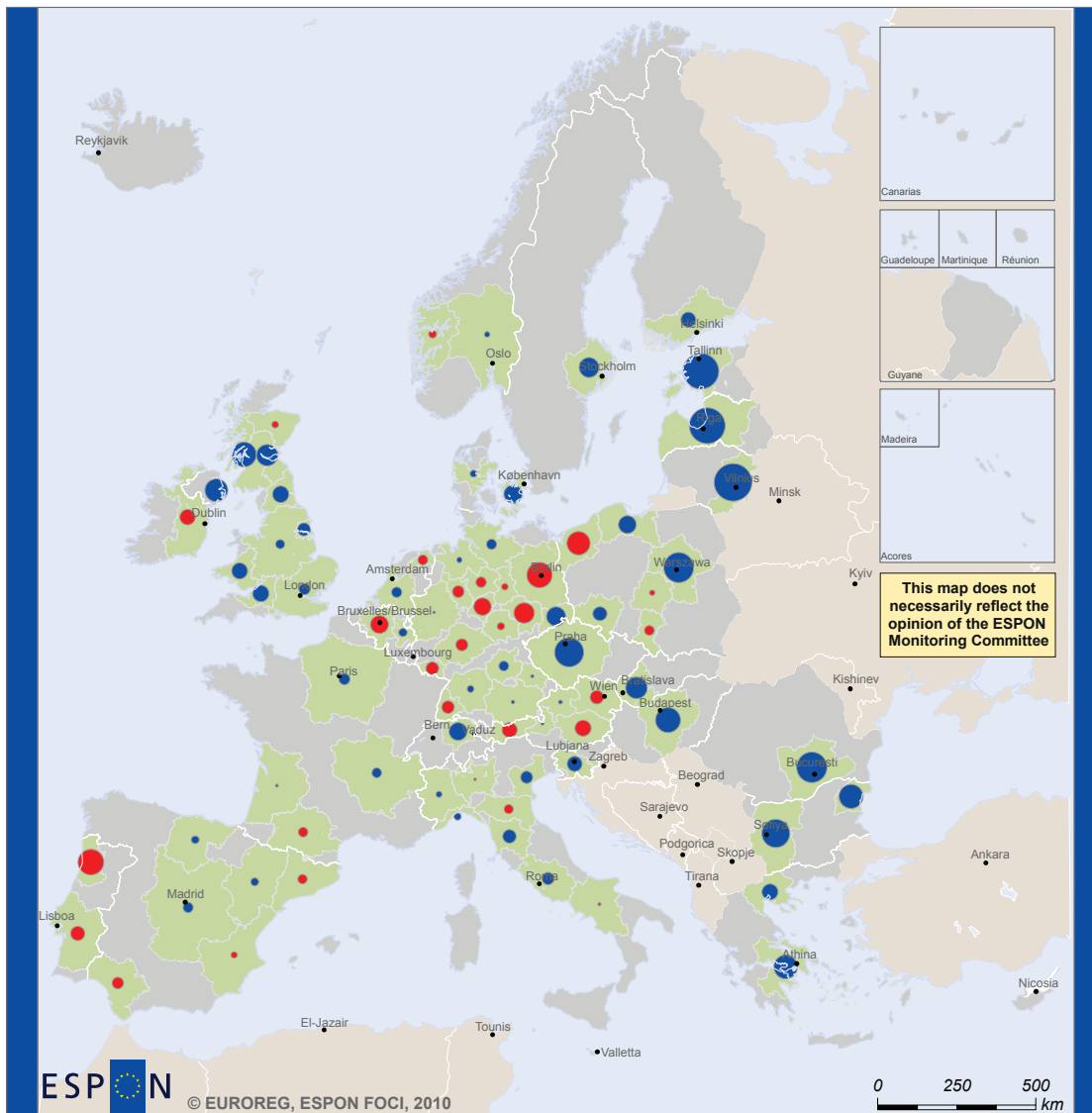
The benefits that can be achieved by rural-urban partnerships are highly dependent on local, and ultimately unique, contextual factors. The structures (both territorial and organisational) of governance, organisational support for rural businesses, and the quality and effectiveness of local and strategic level economic development provide a broad differentiator of rural areas. As drivers of rural differentiation they are by no means straightforward as their impacts will not be felt uniformly across rural areas. Among the influencing factors are:

- Connectivity to urban centres for commuting and service provision
- Rural centres and small town networks as local hubs for service, trade and administration
- Local tourism including the reframing of farming practice and their implications for the countryside as a place for consumption (of leisure, culture etc.) rather than production.

It is also important to recognise that closer integration of town and country within a functional region produces many challenges for policy makers. In the UK for example, there are many accessible rural regions that appear to benefit from their linkage to a local urban centre. Although there are pockets where retirement migration has created unbalanced age structures, the population of many accessible, intermediate or rural areas is relatively young, due to in-migration of young families in pursuit of a “rural lifestyle”. In those regions the structure of the economy is increasingly urban in character and similar to that to which Europe 2020 aspires. There is a strong tertiary sector, growth of knowledge-based secondary activities, while primary industries and resource-based manufacturing have become less important to the regional economy.

The influx of “incomers” to such regions may indeed see a growing rather than a declining population. However, it does not follow that this necessarily enhances local living conditions. Typically the in-migration causes house prices to rise out of the reach of long-term residents and especially young people employed in more traditional (and low paid) rural occupations. Some rural services, especially retailing and financial services are in decline as the majority of the population commute, and access those services close to their workplace. Public transport is in decline as the majority of the new rural households have at least one car. These developments place non-commuting and long-term residents (especially the elderly) at a further disadvantage, and raise concerns about social cohesion.

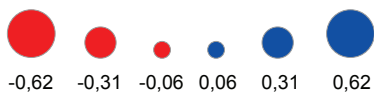
Map 10. Disparity levels between Metropolises and the surrounding region, 1995-2004



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Regional level: NUTS 3  
Source: ESPON 2013 Database  
Origin of data: ESPON Project FOCI  
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Change in GDP per capita ratio 1995-2004



This map shows how disparities in GDP per capita between urban areas and their rural hinterland changed between 1995 and 2004. The functional regions in the eastern parts of the ESPON space show a marked increase of disparities. Also in the UK substantial increases of disparities can be noted. In contrast in Portugal, Germany, Belgium and Austria, disparities have decreased in most cases.



It appears that the change of disparities in eastern Europe is linked to the overall economic development of the regions. Strong economic growth in the cities has created opportunities which rural areas that are often still very agricultural cannot match. Growing disparities are the result. However, different phases in urbanisation processes may also play a role. In the UK, for example, there has been a strong attempt to regenerate urban centres and to attract and hold higher-income groups there.

### Box VII. EXAMPLES OF CONNECTED RURAL REGIONS

#### **North Yorkshire, UK**

North Yorkshire, in the North of England, has two towns of more than 50,000 population, but more important for accessibility is its closeness and connections to a number of significant cities. This accessibility, however, is not uniform, and the more upland areas and coastal parts of the region are poorly connected and suffer from poor services and limited economic opportunities, even though North Yorkshire as a whole is relatively affluent. The two upland areas are protected for their environmental and landscape quality, and traditional farming practices contribute to the conservation of these areas and the attraction of visitors and tourists, an example of the consumption of countryside.

Aspects of counter-urbanisation are important for the accessible parts of the region: particularly out-commuting, and in-migration from the cities. In the accessible areas agricultural employment is not significant, but in the uplands it can be very important, though small in absolute numbers. Tourism is an important employer across the region; the public sector and services also employ many staff.

#### **Chelmsko-Zamojski, Poland**

Chelmsko-Zamojski is situated on the eastern border of Poland with strong connections between the towns in the region. It includes two major urban centres – Chelm and Zamosc – and numerous small towns. The polycentric nature of the region is important, with numerous small towns providing service, market and administration functions, and the continuing dominance of semi-subsistence agriculture (55% of the region's population is employed in agriculture). Cross-border co-operation and trade with Ukraine has become more difficult since accession to the EU. The region is currently depopulating through out-migration, particularly of the 20-40 age groups, and through natural decline exacerbated by the relatively low number of women. However, strategic programmes and foreign investment are beginning to have an impact: there is some development of larger, more commercial farms, and the attractiveness of the landscape and cultural heritage have been identified as the basis for tourism development.

#### **Jönköping, Sweden**

Jönköping County in the South of Sweden, is situated within a triangle formed by three major cities. It is this proximity to major cities that means that the region is classified as “accessible”, although for those living in the centre of the region this is not the case, and the comparatively deprived nature of the lives of these people is emphasised. Regional government is attempting to address the processes of rural depopulation and the centralisation of services by developing a hierarchy of service centres at different scales. There is also a policy emphasis on linking the rural areas more effectively to the urban areas, enabling commuting and flexible work/life patterns for rural residents, but also more easy access to the countryside for urban dwellers. The economy is now mixed, with many small, entrepreneurial businesses; the primary sector industries only employ 4% of the region's population. The open countryside is valued as a public good: for access, recreation and conservation.



### **Rural globalisation and rural business networks**

Smart and globally connected places in rural areas have a role to play in delivery of the recovery envisaged in Europe 2020. Just as in the urban areas, networks are a crucial organisational form for business and for regional development. There are vertical networks that link businesses across geographical scales (local to global) via different stages in the production chain, and there are horizontal networks that connect locally based producers, institutions and consumers. Understanding such networks, and facilitating them is important in the nurturing of regional resilience. Through the vertical networks rural regions can tap into additional resources of capital and knowledge. The networks provide channels for information flow and become factors promoting or inhibiting business innovation. Business networks can bond actors in a specific locality and concurrently can bridge actors with the non-local environment.

Strong local networks facilitate transmission of information (on new technology, potential demand, matching partners, etc.), and decrease transaction costs through prevailing trust and loyalty. They facilitate collective action or even lobbying. Horizontal business networks may support an innovative milieu and advance a lagging area to a “learning region” where regional competitiveness is bound up with the local business network’s ability to absorb, disseminate and effectively utilize technical and market intelligence. On the other hand, very strong local networks may also discourage economic agents from seeking new opportunities, drive individuals to have low incentives and be exclusionary.

In this context, a rural area’s success is a function of its ability to participate in the more profitable elements of globalised economic activities, and to avoid the exploitation associated with flexibility, and secondary segment employment. This means implanting the knowledge economy and building a “new rural economy”, which is nowadays the dominant source of rural employment and incomes, except in Southern and Eastern Europe.

The rural areas in the east remain vulnerable in this respect for reasons associated with their recent political and institutional history. More widely, the comparatively small size of most rural-based enterprises, and their lack of agglomerated critical mass, renders many sparsely populated regions relatively weak in the face of global competition. A common compensation strategy is based upon the idea that local rather than global capital may underpin successful local economies, seeking to develop products, which depend upon a local identity for their market niche, so “selling local to the global”.

There are different types of global connections of rural areas. Among them are:

- **Rural innovation regions**  
Innovative and high-tech companies with worldwide trading and collaboration links can be found in rural areas. Indeed, examples from Finland, Norway but also southern Germany and other parts of Europe prove that there is innovation and global trade in rural areas. Innovation is not an exclusively urban issue.
- **Worldwide trade with natural resources**  
Natural resources with a worldwide market are also found in rural areas. These can comprise very different types of products ranging from wood or peat to iron ore products. In many cases the trading links are mainly with companies in closer proximity which then put the products on the global market. However, there are also cases where the companies in the rural areas interact directly with their clients around the world. This is the case with iron ore pallets produced in Northern Sweden.
- **Worldwide branded agricultural products**  
Rioja, Tokaji, Champagne, Gruyère cheese, Scotch whisky are just some high-end agricultural products which come from specific rural areas and are known worldwide. The global branding of local products shows smart rural areas being directly linked into the global market.

- Rural tourist destinations known worldwide  
Whereas some rural areas produce goods which are consumed or used all over the world, others attract visitors from around the globe. Both are examples of smart rural areas well interlinked with the rest of the world. The beauty of the natural landscape and cultural heritage can position rural areas as tourist destinations all over the world. Examples for this are the castle of Neuschwanstein in Germany, Kleinwalsertal in Austria, the Icehotel in Sweden or the Blue Lagoon on Iceland.

### Box VIII. La Rioja, Spain

A well known example of a rural area well integrated into the global market is La Rioja. Here, there was a long history of significant trading in wine not only with adjacent urban areas, but also with France. More recently, there have been significant increases in the production and sales of wine to new overseas markets.

La Rioja region is split into an accessible and densely populated lowland area in the north, and a southern mountainous area of low and depleting population. Agriculture and industry are the most important economic activities. The main agricultural activities are viticulture and some horticulture. Wine production (from the grape crop to the bottle) has been important in the region since the mid-1800s, and much of the wine has been exported to France ever since. Significant modernisation processes have taken place during the last 20 years, and EU accession and global capital penetration have contributed to the development of a high quality product for an international market. The accessible part of the region has also experienced substantial counter-urbanisation and also significant international immigration (mainly from Morocco and Romania), in contrast to the depleting and ageing population of the more mountainous part.

Rural business clusters provide a new model of economic development for rural areas in which development is a collaborative process involving government at multiple levels, companies, teaching and research institutions and institutions for collaboration. As such, competitiveness is a bottom-up process in which individuals, firms, and institutions take and share responsibility to address the specific barriers faced by their region and companies in a given market and not just the general challenges. In delivering the Europe 2020 strategy, local and regional governments and development agencies across rural Europe will need to look at their own specific situations and see how they might work with other partners to develop rural business clusters.

Clusters stimulate and enable innovations in several ways. They increase the likelihood of spotting innovation opportunities, assist knowledge creation, facilitate experimentation and provide a strong incentive to strategic differentiation that is often the result of incremental innovations. Finally, clusters support entrepreneurship because they provide opportunities for new companies, encourages spinoffs and start-ups and the commercialization of new products from new companies.

The operation of rural tourism clusters is a vivid example of successful rural clusters where businesses from the primary, secondary and tertiary sectors can benefit by utilizing common natural and environmental resources. Farms provide local food, manufacturing firms process local products or produce artisan goods while small hotels, restaurants, tour operators, recreational agents etc, provide services that reaffirm and enhance the rural tourism experience. With careful management the risks of depleting or devaluing natural and cultural assets through over-exploitation can be avoided. Similarly, the risk of growing dependence of a region's economic development on a single sector can be avoided by monitoring trends and benchmarking with similar regions.

## 2.4 Cross-border links

Cross-border areas are another type of territory where the smart development of links can capitalise on development potentials. Enlargement of the EU has led to a number of border regions setting up dynamic functional relationships with their neighbours. The focus is on the smart use of the diversity which border regions have; diversity in terms of culture, lifestyles, quality of life, housing costs, wage differentials, labour supplies, economic performance or national fiscal systems.

The close proximity of diverse actors within a region is a development potential even within a country. As national borders imply an additional level of diversity, this can be turned into a comparative advantage. It requires, however that both sides of the border are well connected in transport terms and that there is a mutual interest to pursue the potential of the cross-border diversity.

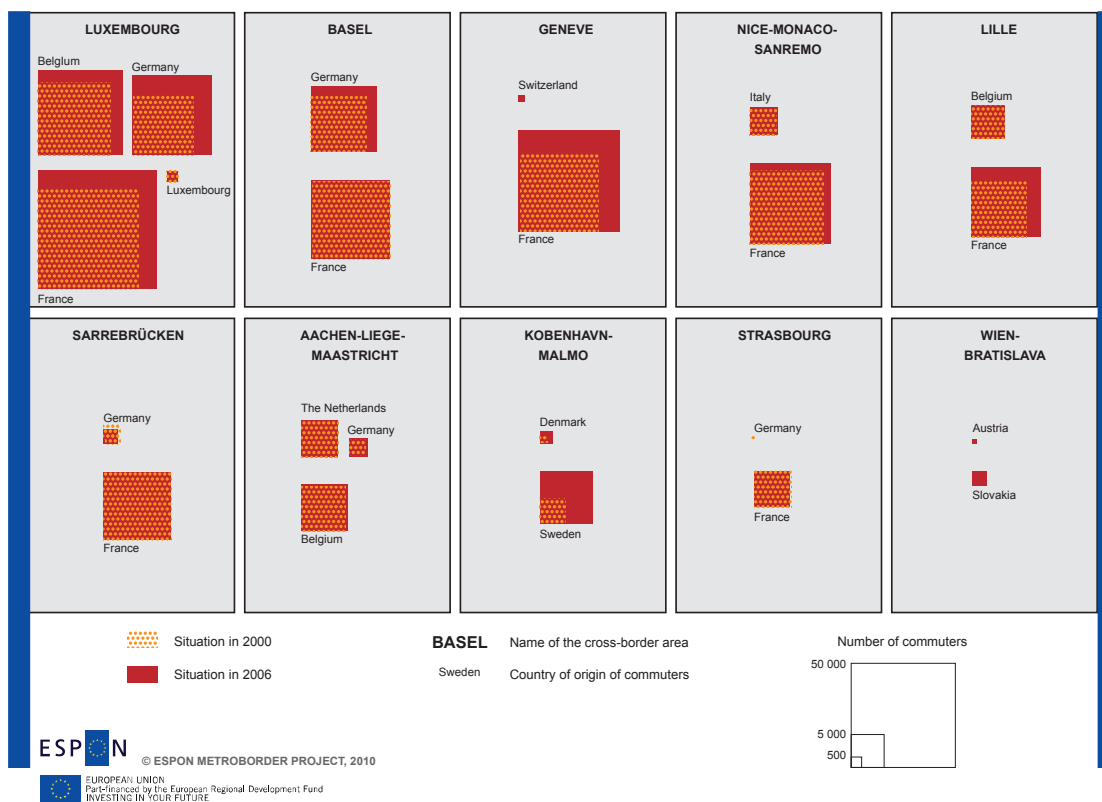
Within the ESPON space 23% of cities have the potential to build cross-border metropolitan regions by linking up with cities on the other side of the border which are within commuting distance. These regions are mainly concentrated along borders stretching from the Benelux countries to Northern Italy, but also along those situated between Slovenia, Hungary, Slovakia and Poland.

There are some notable differences in patterns of commuting and “cross-border living” amongst the cross-border regions.

### Cross-border commuters

Cross-border commuters contribute to cross-border integration and exploitation of cross-border diversity as development potential. Thus, they make cross-border regions smart connected places.

Cross-border commuters in metropolitan areas, 2000 and 2006



Cross-border commuting is an indicator to measure the intensity of the home-work flows across a national border. In the ESPON space, the number of cross-border commuters amounted to 778,500 in 2007, which is a rather low volume given the number of potential cross-border functional regions. In the 1990s, Switzerland, Germany and Luxembourg were the first destinations for cross-border commuters. Since then flows to Switzerland, Luxembourg, Austria and the Netherlands increased (coming primarily from France, Germany and Belgium), while flows to Germany declined.

### **Cross-border residents**

Cross-border residents (citizens holding the passport of the one country but living across the border in the other country) go one step further than cross-border commuters in the utilisation of the diversity of cross-border regions. They contribute to developing smart connected places into integrated places.

This attractiveness is influenced by jobs, living standards and costs, and reduced commuting times. However, there are also barriers to cross-border living: cultural or linguistic differences and fiscal systems. Analysis of the ten case study areas – presented above – shows some cases with significant shares of cross-border living, in particular in Geneva and Luxembourg. In both cases, the language barriers are comparably low. In the German-speaking city of Basel, the most important foreign resident community is the German one, whereas there are more cross-border commuters coming from France. This illustrates the importance of linguistic barriers in residential dynamics.

The graphic illustrates that the commuting intensity varies considerably between the different cross-border regions, depending on the different size, average annual economic growth and its distribution among the regions. With more than 127,000 cross-border workers in 2006, the Greater Luxembourg is undoubtedly the border area where the greatest number of people commute every day over a national border. It is followed with some distance by Basel (49,000), Geneva (47,500), Nice-Monaco-Sanremo (34,000) and Lille (27,500). Saarbrücken (21,500), Aachen-Liège-Maastricht (17,500) and Copenhagen-Malmö (13,500) have lower numbers of cross-border workers, while Strasbourg (6,000) and Vienna-Bratislava (1,000) have considerably less cross-border commuters. During the period 2000 to 2006, the largest changes in absolute numbers were in the cross-border regions of Geneva, Lille and Copenhagen-Malmö.

In most cases, the distribution of cross-border workers by country of origin is extremely asymmetric. This is particularly true for the cross-border regions of Luxembourg, Geneva, Nice, Saarbrücken, Copenhagen-Malmö and Strasbourg, where 90% of the flows are moving from one country to the other. Even though the figures are not weighted by regional population they give a first idea on the level of cross-border connection.

The exceptions worth mentioning are the cross-border regions of Lille and Aachen-Liège-Maastricht, which show a more balanced pattern of cross-border commuting. This reflects the dynamic economic development in the urban centres on both sides of the border, including rather similar levels of salaries, taxation, and real estate prices. Furthermore, there is a polycentric urban structure which is also underlined by the public transport networks in the regions.

### Box IX. Concentration, Connection, Co-operation: Cross-Border Regions

Active co-operation to improve connections can help to create new cross-border metropolitan areas that then have the scale and concentration of functions to improve their economic capacity. For example, they are able to offer a larger pool of labour and for workers access to a wider range of job opportunities. A knowledge-intensive economy driven by an international financial centre can create significant opportunities for cross-border employment, as happens in the case of Luxembourg, Geneva and Monaco. The high-technology industries in Basel have a similar effect. Co-operation can also create the kind of concentration required to host major international events. For example, Luxembourg and its cross-border partners in the Greater Region undertook the role of European Capital of Culture in 2007. The international architecture exhibition, IBA Basel 2020, is another example. Switzerland and Austria jointly hosted the European national football championships finals in 2008.

Co-operation across borders could also help to improve access to hospitals and to emergency services (where time-distance can be critical) in some rural regions, for example along the Belgian-German border. Indeed there is evidence that trans-national scale planning of these essential services can be more effective than just looking across borders. Other possible themes for cross-border co-operation are spatial planning, culture, training, economic development and tourism and the integration of public transport networks. The latter are especially important for connecting a cross-border region. For example numerous public transport services enable many people from Lorraine, Wallonia, Rhineland-Palatinate and Saarland to work in Luxembourg. There are similar public transport success stories in Vienna-Bratislava and Copenhagen-Malmö.

Institutionally, cross-border co-operation can take various forms: informal charters, a non-profit association as in the Eurodistricts in Basel, Saarbrücken and Strasbourg, or the Øresund Committee. The European Groupings of Territorial Co-operation has enabled some border local governments to form cross-border bodies with legal status.

## 2.5 Territorial impact assessments for smart place development

The development of smart places requires knowledge about how different policies – and their combination – affect the development of the region.

A wide range of sector policies at European and national level have territorial impacts. This has already been shown by a number of previous ESPON studies.

Sector policies have their own budget lines and instruments to achieve their aims, and usually they are not asked to consider their territorial context and impacts. Territorial concerns are normally not among their aims and priorities, although they have the potential to assist the realisation of territorial cohesion and competitiveness. Even if unintentionally they can shape the development possibilities for places.

### Box X. Finding the right policy mix

Aims of policies are normally best achieved through the creation of a “policy mix” including support from several policy areas or sectors. Even in its own sector, a single policy cannot achieve as much as the smart mix of different policies and their instruments. Furthermore, there are considerable costs of non-coordination where different policies affect each other in a negative or counter-productive way.

Greater awareness of territorial impacts of sector policies could promote better understanding and use of synergies amongst different policies by policy makers, and thus make better use of limited public resources and contribute to more competitiveness and territorial cohesion. Smart policy-making means not only maximising benefits within one sector, but also achieving helpful spin-offs to other EU priorities. Such win-win outcomes give best value for public money, while ignorance can be costly.

Territorial impact assessments can contribute to a better judgement of how a policy affects development in different regions. Evidence of the effects of policies can be a first step towards identifying possible synergies – or the opposite - between policies and starting a constructive dialogue across policy fields. ESPON is developing approaches to territorial impact assessments and also the number of EU policy areas for which territorial impact assessments are conducted.

### Box XI. ESPON Territorial Impact Assessments

#### Finalised

- EU Transport Policy (ESPON 2013 – TIPTAP)
- EU Agricultural Policy (ESPON 2013 – TIPTAP)
- EU Transport and TEN policies (ESPON 2006 – project 2.1.1)
- EU Research and Development policy (ESPON 2006 – project 2.1.2)
- EU Common Agricultural & Rural Development Policy (ESPON 2006 – project 2.1.3)
- EU Energy Policy (ESPON 2006 – project 2.1.4)
- EU Fishery Policies (ESPON 2006 – project 2.1.5)
- EU Structural Funds (ESPON 2006 – projects 2.2.1 and 2.2.3)
- EU Aquis Communautaire and Pre-Accession Aid (ESPON 2006 – project 2.2.2)
- EU Environmental Policy (ESPON 2006 – project 2.4.1)

#### Forthcoming

- EU Directives (ESPON 2013 – ARTS)
- Targeted analysis of territorial impact assessments (ESPON 2013 – ESPON TIA)

EU transport policies are one example showcasing what a territorial impact assessment may look like. The territorial effects of EU transport policy by 2030 have been investigated. Different scenarios have been studied with regard to a wide range of different indicators addressing territorial efficiency, territorial quality and territorial identity, which are seen as the elements of territorial cohesion in the applied research conducted.

Results show:

- Economic growth. Overall, the territorial impact assessment of transport policies confirms the general economic benefit of ongoing infrastructure investments. The scenarios show an increase in the productivity of the transport networks adding to the competitiveness of the regions and increasing market potentials and economic wealth (GDP per capita). Furthermore, they show the emergence of a new economic growth area in central Europe described by the cornerstones Prague, Krakow, Budapest and Vienna.
- Intra-regional integration. Increasing intra-regional integration through the improvement of secondary networks is expected to happen up to 2030 in the countries particularly engaged in ongoing infrastructure investments (e.g. Spain). Increasing infrastructure investments in the east may also contribute to improved secondary networks and intra-regional integration in these countries. This is important as it allows developments to spread from the major centres towards cities of second and third rank.
- Congestion and emissions. On the downside, transport congestion and emissions are likely to increase to unacceptable levels in some regions. In large parts of Europe the infrastructure appears to be insufficient to accommodate the forecast traffic increases. Congestion is therefore expected to increase substantially, and show particularly bad impacts in the UK, Denmark, Romania and Bulgaria. Furthermore, second and third rank airports may substitute to give increased inland mobility. However, one of the scenarios shows that when proactive counter measures are taken in the form of pricing and regulation, the picture changes significantly. The predictions under this scenario are that emissions are kept below existing levels, though problems do persist mainly in the eastern parts of the continent.

As compared to previous territorial impact assessments, a new and innovative element has been introduced in the latest ESPON research work. This is the FLAG model. This combats the risk that the combination of scores for different indicators may provide a “satisfactory” picture overall of the future, despite the fact that one or more of the indicators exceeds critical thresholds. To avoid a result where positive developments for some indicators can balance out unacceptable negative developments of another indicator, e.g. levels of emissions, warning flags have been introduced. When the expected impact of one indicator exceeds a certain threshold, a “warning flag” is raised.

The three maps show the territorial impact of three transport policy scenarios in terms of greenhouse gas emissions. They use the Flag Model to identify regions where emissions are expected to exceed the acceptable threshold, which is set as the present level of emissions.

These scenarios analyse and forecast traffic development on TEN-T corridors up to the year 2030 based on work of the European Commission.

There is a Baseline scenario for 2030. This includes all road and rail investments already implemented or already planned for construction. It sees widespread emission problems, with the concentration particularly high in the core. However, the degree to which the threshold is exceeded is actually greater in the more peripheral regions of eastern Europe in Poland, the Baltic States, Bulgaria and Romania as well as the south of Ireland, south-western Sweden and northern Greece.

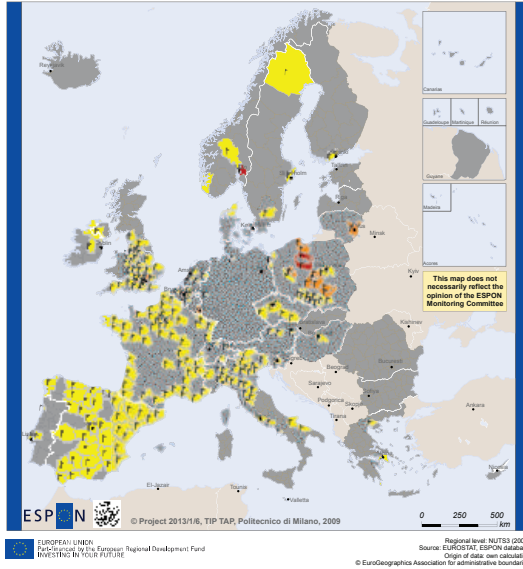
The Enhanced Infrastructure scenario anticipates higher economic growth than the Baseline scenario and therefore encompasses additional and more comprehensive infrastructure links. Under this scenario, the problems in the core are much less, but those on the periphery look much the same. On this scenario, as in the previous one, emissions levels in many peripheral eastern regions look set to double or more.

In the Pricing scenario new regulatory tools such as rules on safety and road pricing come into play, with rather dramatic impact. These measures succeed in containing emissions across much of Europe to at or below current levels. In particular in the eastern parts of the continent, the intensity of the emissions is substantially reduced.

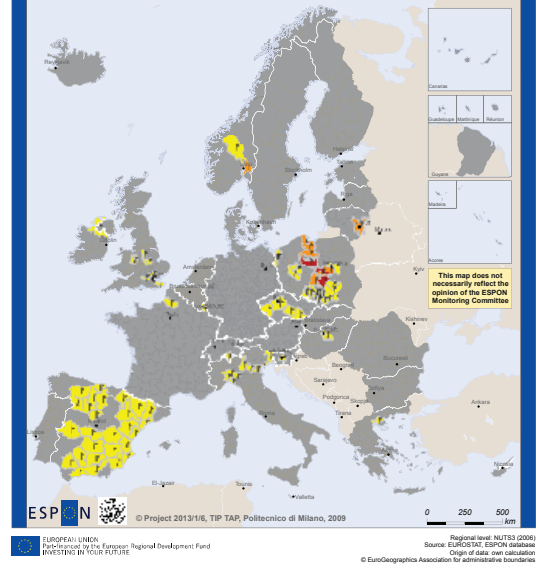


Map 11. Transport policy options and their implications for emissions, 2005

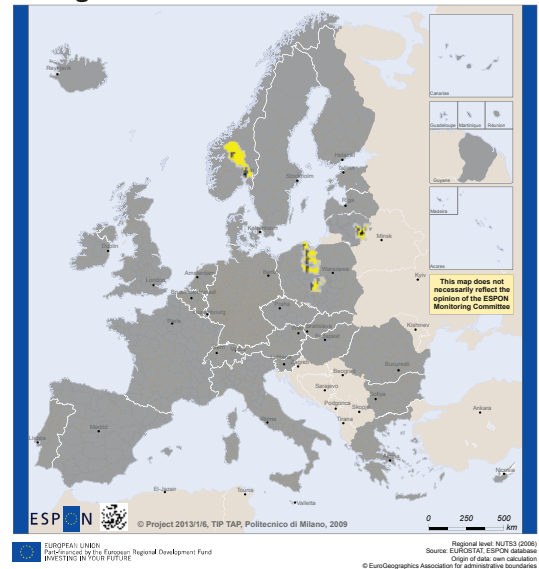
**Baseline Scenario**



**Enhanced Infrastructure**



**Pricing Scenario**



**Emissions level 2005 > EU average  
 and increase in emissions 2005-2030 > 0**

- ↑ Flagged Regions
- Over the threshold (some risk)
- More than 50% (high risk)
- More than 100% (very high risk)

### 2.6 European macro-regions – paths for synergies?

Developing a polycentric Europe with connected smart places needs team work. Various development potentials and challenges can only be solved in cooperation between different stakeholders. Cooperation in transnational areas, as well as macro-regional development strategies that bring together stakeholders from different countries and sectors can be one way forward. Their main aim is to support the development of smart and connected places to the benefit of Europeans and so contribute to the overall development and competitiveness of Europe.

The EU Strategy for the Baltic Sea Region, and also the forthcoming EU Strategy for the Danube Region, are recent examples for such macro-regional strategies. Both the selection of development challenges for the macro regions and the governance arrangements underline a strong place-based development approach. The focus is on common development challenges and potentials. Evidence on the development potentials and challenges at macro-regional level, as well as on governance mechanisms in a macro-region, are key inputs for exploring in full the added value of a place-based macro-regional strategy.

The focus of the macro-regional strategy for the Baltic Sea Region is on environmental sustainability (e.g. reducing pollution in the sea), prosperity (e.g. promoting innovation in small and medium enterprises), accessibility and attractiveness (e.g. better transport links) and safety and security (e.g. improving accident response).

To deliver on these themes, develop target measures and monitor the success, detailed knowledge about territorial development in the Baltic Sea Region is needed. ESPON provides insights which can be used for making the strategy a success and also allow for regional monitoring. The implementation of the strategy needs to take into account territorial diversity and potentials within the Baltic Sea Region, e.g. as regards the location of economic developments, the functional specialisations within the urban system, rural-urban settings, patterns of accessibility, connectivity provisions and environmental conditions as well as governance.

While the imbalanced economic wealth and urban systems in the Baltic Sea Region are widely known, other facets of its territorial diversity are often neglected – albeit they are crucial for understanding the development processes. One example is the interplay between (a) rural-urban settings, (b) economic structures, and (c) accumulation & depletion.

In the Baltic Sea Region, the rural-urban settings differ considerably. In a European perspective Estonian, Latvian and Lithuanian regions are mainly characterised as regions that are “intermediate close to a city”. Most regions in Poland and northern East German have predominantly rural settlement structures yet are close to a city. The same is true for some Nordic regions. However, in the Nordic Countries a large number of regions are in a European perspective remote. Even when it comes to local accessibility to the nearest urban centre they are much more remote than the southern parts of the Baltic Sea Region.

There are also clear differences with regard to the economic structures in the rural areas that may call for diversified actions. Whereas Latvia, Lithuania and Poland have mainly agrarian rural regions, the rural regions in north-eastern Germany, the Nordic Countries and also most of Estonia are characterised as consumption countryside, where recreation and tourism are particularly important.

While the rural regions south of the Baltic Sea are mostly depleting, the disparities in economic wealth between the urban areas and their hinterland are increasing strongly in particular in Estonia, Latvia and Lithuania. On the other hand north of the Baltic Sea, the rural regions enjoy economic wealth above the European average and differences between the urban areas and their hinterland are only increasing slightly. Furthermore, it has to be noted that in absolute terms the urban areas north of the Baltic Sea region have a higher economic performance and are better integrated into global networks.

All of this implies that the implementation of the aims of the Baltic Sea Strategy needs to be tuned to these complex realities. What cities in the macro-region should play what role in the development? Can the metropolitan strength of the macro-region in global competition be reinforced through co-operation arrangements involving metropolitan regions? How can the rural regions in the south and east learn from those in the north and west and make the transition to the new rural economy? What are the opportunities from proximity to urban areas and how could they be realised? Could public transport improvements make them attractive to commuters? What and where are the potential rural business clusters and how can they be supported and networked?

Another type of territorial division within the Baltic Sea Region can be observed in the energy field. The Nordic Countries and Baltic States have considerably higher shares of employees in sectors with higher energy spending than the Polish and German regions along the Baltic Sea. At the same time, they have a higher wind power potential which can be further developed. What kind of energy balances do the countries have, and is there scope for connecting networks to increase security and resilience?

These are just a few flashlights stemming from ESPON findings which can be relevant for the implementation and further development of the Baltic Sea Strategy. Together they allow for a nuanced discussion of territorial capital that could contribute to the EU Strategy for the Baltic Sea Region.

Similarly ESPON has discussed with a number of regional stakeholders development scenarios for the Latin Arc – stretching from southern Portugal to southern Italy along the Mediterranean coast. Based on ESPON results four types of territorial capital were discussed:

- Infrastructure capital and settlement structure, encompassing also the characteristics of the urban system and the quality of the environment.
- Cognitive capital, in the form of knowledge, competence, capabilities, educational and research structures, embedded in both productive capital and human capital.
- Cultural and identity capital, encompassing cultural heritage, landscape and natural capital.
- Social and relational capital, in the form of both civil society and associative capabilities.

The opportunities mentioned by using a territorial or place-based approach in relation to the European Union Strategy for the Baltic Sea Region and the scenarios for the Latin Arc are examples of how ESPON results can be used to inform the development of macro-regional strategies and scenarios.

### **Governance matters**

In addition to territorial knowledge, good governance processes are needed for macro-regional strategies and also more generally for the development of smart connected places. In addition, development strategies also need to consider the limitations of public policy influences:

1. The locational behaviour of firms is the outcome of a myriad of individual firm-level decisions taken for a variety of reasons and not as a result of the designs or preferences of public policy makers.
2. In general, the public sector can only influence location decisions indirectly. Examples of factors of significant influence shaped by the policy sector are major communication infrastructure, training and housing of labour, international connectivity through a globally connected hub airports, clarity, decisiveness and speed of economic development, planning and decision making.
3. The capacity to influence the geography of economic change is distributed vertically, across different levels of government. It is also separated horizontally into different policy areas in which decision-making criteria rarely consider the territorial dimension of policy choices and investments.
4. Understanding about the nature and likely future implications of agglomeration economies remains relatively undeveloped – or at least poorly articulated – within many public policy communities and is not a factor in many policy or funding decisions.

However, smart regulation remains a key responsibility. As seen with traffic congestion and emissions there is a strong business case for use of pricing mechanisms to limit damage that no individual firm can address in isolation without ceding advantages to business rivals. Similarly public sector employment is a key source of skilled and creative jobs in many sparsely populated regions, and public spending and wages support local businesses. The public sector is therefore likely to be an important stakeholder in any territorial development partnerships or co-operation activities.

### Further reading:

Further information on the issues addressed in this chapter can be mainly found in the reports of the ESPON projects on cities (FOCI), rural areas (EDORA), cross-border regions (METRO-BORDER), agglomeration economies (CAEE), territorial impact assessments (TIPTAP), and spatial scenarios (SS-LR).

### 3 – Diverse Europe: cohesion challenges

#### Policy relevant key findings:

- Demographic change and especially migration trends will foster territorial imbalances and polarisations between the richer and poorer areas. More prosperous cities and regions need to anticipate further in-migration.
- Energy dependency of some regional industries will pose substantial challenges with regard to the effects of carbon leakage, i.e. the possibility that companies decide to relocate their production facilities if production costs rise as a result of carbon taxes. Rising energy prices will particularly impact on peripheral regions and those regions and cities with extensive commuting patterns, energy intensive industries and housing stock.
- Links to the nearest central nodes are often very important in remote and sparsely populated regions. For these regions local accessibility is more important than European accessibility.
- Challenged regions can develop into economically vital development areas. To a large degree the success of such convergences is related to governance structures capable of delivering results.
- Scenarios of labour force development until 2050 show that a lot of regions will be hit by a shrinking labour force. Overall the future labour force figures in Europe show a clear East-West divide.

All parts of the ESPON space are increasingly linked into global networks and have to position their comparative advantages and disadvantages in a global perspective. These globalisation trends seem to reinforce territorial divisions and imbalances. European policies underline the need to develop all parts of Europe and not just some islands of wealth. Inclusive growth, balanced development and territorial cohesion have some major principles in common:

Firstly, to strengthen the competitiveness of Europe, the development potential of all regions needs to be utilised. It is not sufficient to rely on the strength of cities and regions that are successful already. Realising development potentials elsewhere makes Europe more competitive and resilient.

Secondly, important imbalances or transfer payments corrode a sense of solidarity and challenge the unity of Europe. Partly they may be seen as hampering the further development of the strong areas, and partly they discourage the less successful areas.

Consequently, development strategies for Europe need to be inclusive. Cohesion and competitiveness measures can and shall support each other.

What is perceived as a challenged territory is very much a question of perspective and the geographical scale of analysis. Article 174 of the Treaty on the Functioning of the EU provides some indications on different categories of territories that need particular attention. However, ESPON results show that other types of territories are also facing difficult situations, and that some areas with specific geographical features (such as islands, mountainous regions or sparsely populated areas) belong to the most prosperous areas in Europe, such as urban centres in the Alps or peripheral areas in the Nordic countries.

### **Treaty on the Functioning of the EU Art. 174:**

“In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions. Among the regions concerned, particular attention shall be paid to rural areas, areas affected by industrial transition, and regions which suffer from severe and permanent natural or demographic handicaps such as the northernmost regions with very low population density and island, cross-border and mountain regions.”

### **3.1 Territorial differences in wealth**

Territorial imbalances can be observed at many different geographical levels. Usually they relate to economic wealth and performance, but increasingly also to demographic patterns or to factors such as innovation, creativity and integration in global networks.

At the global and neighbourhood level, a distinct dividing line can be observed between the ESPON space and the neighbouring countries. However, there are also dividing lines within the ESPON space of 31 countries. Prior to the economic crisis there was increasing economic cohesion at European level, but disparities within countries were growing, for example with increasing differences between wealthy urban areas and their immediate surroundings.

#### **European level divisions in wealth**

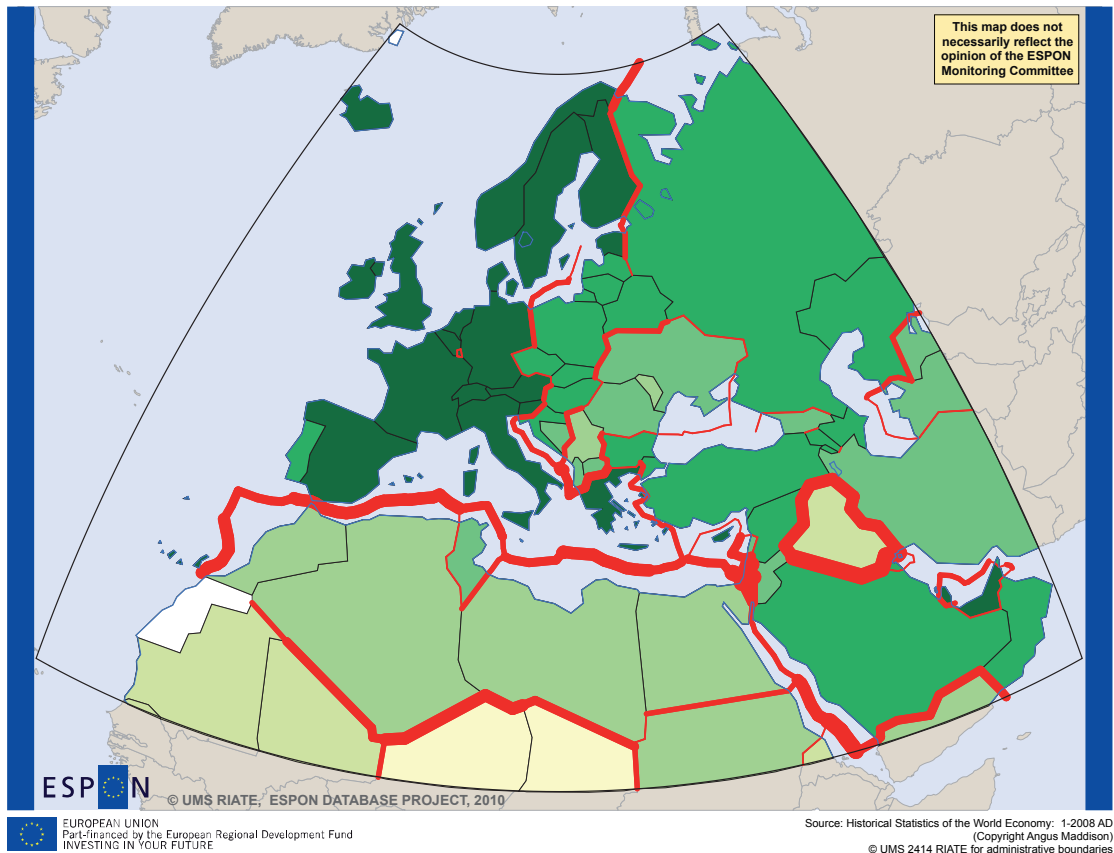
At a European level, currently two major economic divides or discontinuities can be noted.

Looking at national level data, there is a difference between east and west. In broad terms the discontinuity line runs from the Finnish-Russian border in the north to the maritime border between Italy and Albania in the south. In general, those countries that joined the EU during the latest EU accession rounds have lower levels of wealth than older EU member states, though they tend also to have higher levels of wealth than neighbouring non-EU countries.

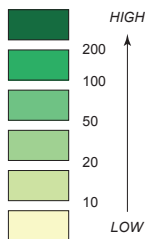
When considering regional data a more nuanced picture emerges which illustrates that there are considerable differences in wealth among a country's regions.

There is also discontinuity in wealth between north and south underlining the differences between EU and non-EU members and also that proximity to Europe plays a role. The strongest dividing line goes between EU and non-EU member states in the Mediterranean. However, another major discontinuity is located in the Sahara, between Northern Africa and the Sub-Saharan countries. This double line of discontinuities demonstrates the significance of territorial relationships. This territorial pattern structures the flow of international migration (from south to north) or of investments and aid (from north to south), with the intermediate area of Northern Africa strategically positioned as an interfacing territory. It also highlights the challenges that Malta faces as a small island state that is geographically Africa's stepping stone into the EU.

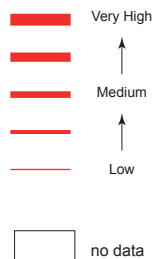
Map 12. Discontinuities of GDP per capita, 2008



**GDP Per Capita 2008**  
(1990 International Geary-Khamis dollars)  
index 100 = World



**Discontinuities**  
(relatives)



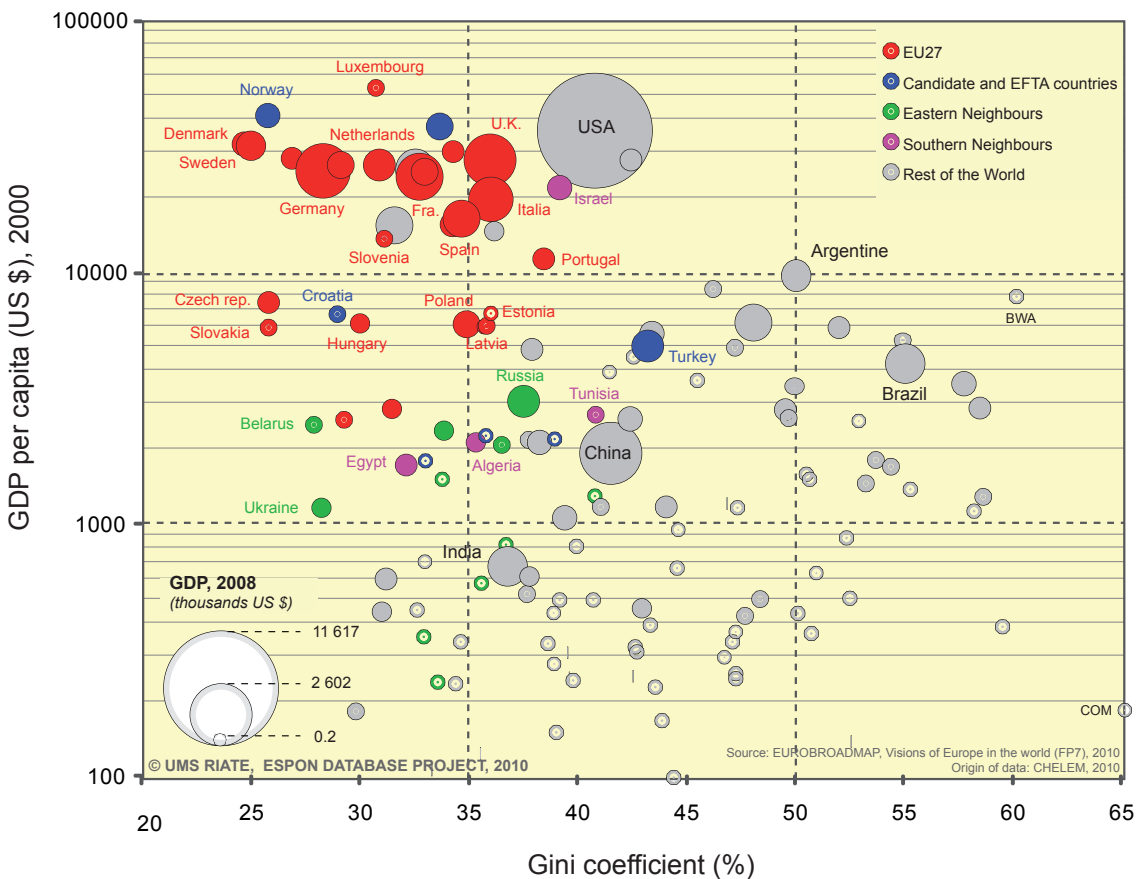
The map shows the differences in GDP per capita in PPS at national level. Based on that, the main cross-border discontinuities have been identified by the red lines: the thicker the line the greater the gap between the countries. The sharpest divides are between Europe (including Turkey) and North Africa, and between Finland and Russia. However there is also an economic division within Europe between west and east, a gap that also separates off Greece and Cyprus. It is also notable that the discontinuity between the Neighbourhood countries of North Africa and those to the south of them across the Sahara is as great again as the Europe / North Africa disparity.



Given the different actual wealth levels, some of the neighbouring countries will achieve higher GDP growth rates than the EU, because any increments are to a lower base figure. Together with the considerably higher growth figures in other parts of the world, this implies that the EU's share of the world GDP will continue to decline. This is a continuation of the developments over the past 50 years, and shows that in terms of growth rates and its relative economic standing in the world then Europe as a whole is challenged.

These divisions in economic wealth are paralleled by divisions in demographic profiles. Whereas the demographic perspectives largely follow the wealth divisions between east and west, they show a reverse picture for the north-south dimension. The southern neighbours are expected to experience a population increase between 2000 and 2030 which goes well beyond the increases expected within the ESPON space. Further south in Africa, beyond Europe's immediate neighbours, there is another group of countries whose annual population increases are expected to be even higher.

**Economic performances and social inequalities, 2000**



A high level of GDP per capita does not necessarily imply high social welfare as the latter depends also on the level of economic inequalities between inhabitants. To measure the dispersion of wealth in a country, the Gini coefficient is used. This is a measure of the inequality of a distribution, a value of 0 expressing total equality and a value of 1 maximal inequality. The graph illustrates the relation between wealth (expressed in GDP) and social disparities (expressed by the Gini coefficient). It shows that the wealthiest countries are generally characterised by the lowest levels of social disparities. At the same time it highlights the European social model: the countries of the ESPON space are generally characterised by lower levels of inequalities than other countries of the World.

Going into further detail three different groups can be identified:

- EU15, Switzerland, Norway and Slovenia are all characterised by high level of GDP (above 10,000 EUR per inhabitant) and moderate levels of inequality as compared to e.g. the USA or Singapore. Nevertheless, there are noticeable variations of social disparities, with low Gini coefficients in the Nordic Countries and much higher ones in the UK, Ireland, Spain, Italy, Greece and Portugal.
- EU10 (the countries that joined the EU in 2004) and some candidate countries like Turkey and Croatia are characterised by medium levels of GDP (6,000 – 9,000 EUR per inhabitant). However, they have considerably lower levels of inequalities than other countries with comparable levels of wealth. Within this group Hungary, the Czech Republic, Slovakia, and Croatia have rather limited disparities whereas Poland, the Baltic States and Turkey have higher levels of social inequalities.
- Romania, Bulgaria and the EU neighbouring countries have lower levels of GDP (less than 3,000 EUR per inhabitant). However, as in the cases above, they have moderate levels of disparities as compared to countries with comparable levels of wealth elsewhere on the globe.

#### **Dispersing core-periphery patterns in Europe**

The idea of a polycentric Europe, using the metaphor of “a bunch of grapes”, was developed as a counter-model to increasing core-periphery divides. Polycentric development is a means to balanced territorial development and in many regards also to the aim of territorial cohesion.

The core-periphery differences in Europe are still evident on many indicators. However, from the 1990s the European core was extending along a number of development corridors. One such corridor stretches in the UK through the West Midlands towards Manchester. Another reaches into Central and Eastern Europe, and a third heads into Southern Italy.

The expansion or dispersal is most notable in the urban agglomerations. Connections into global networks vary, and some cities are hubs and gateways linking Europe to other parts of the world, e.g. Madrid to Latin-America. Larger functional urban areas as well as small and medium sized towns outside the European core are gaining ground as important nodes for European development. Many of them are important economic engines for their areas and some even outperform urban areas within the core. Among the strong urban nodes outside the European core area are Madrid, Barcelona, Dublin, Stockholm, Helsinki, Oslo, Warsaw and Budapest.

Europe’s “powerhouse” in the core expands, but not all areas within this central part of Europe show the positive characteristics normally attributed to the European core. While the growth of urban centres makes Europe more polycentric, that same growth may widen disparities between these main centres and the rest of their national urban systems. Thus, as the European core is taking a new shape, also the shape of the periphery changes. Even places that are quite central within the core can be, in effect “inner peripheries”. Examples here include places in Northern France and Wallonia in Belgium.

Basically, Europe’s territorial imbalances are the results of historical patterns of investment that have created their own momentum and will persist in the long term. However, the dispersing core, strong international hubs all over Europe, liveable smaller and medium-sized towns which are international centres of excellence in specialised functions, along with the diverse and attractive rural areas of Europe, show that it is feasible to achieve a more balanced spread of growth and opportunities. However, market trends towards increased territorial concentration must also be recognised. Providing a supportive environment to encourages private investment and business growth that furthers territorial balance and cohesion is a key economic development task.

Many of the main territorial discontinuities exist at geographical levels below the European level. Often they are related to particular types of development challenges, which will require supporting action from national, regional and sometimes local level to reduce the gaps.

### 3.2 Demographic challenges

Over the last decade new awareness has grown of the significance of demographic change and discontinuities, as demographic and economic developments have a mutual relationship. Today's demographic trends are complex but central to making progress towards territorial cohesion.

#### **The regional dimension of demographic change**

Population growth in Europe has slowed down and many regions already face a demographic decline. In only a few years the overall European population figures are expected to peak and thereafter Europe will experience an overall population decline. On some projections this could be up to 40 million by 2050.

The fall in population goes along with a substantial ageing of European society. People not only live longer; birth rates have fallen substantially over the past decades. So the median age of society increases. This has substantial consequences for the health care and pension systems. However, the growing number of elderly people also offers potentials for the development of the European society.

The changing age structure has direct implications for labour supply. Fertility and migration flows lead to differences in the growth and aging of the labour force, while in turn differences in economic developments affect fertility and migration.

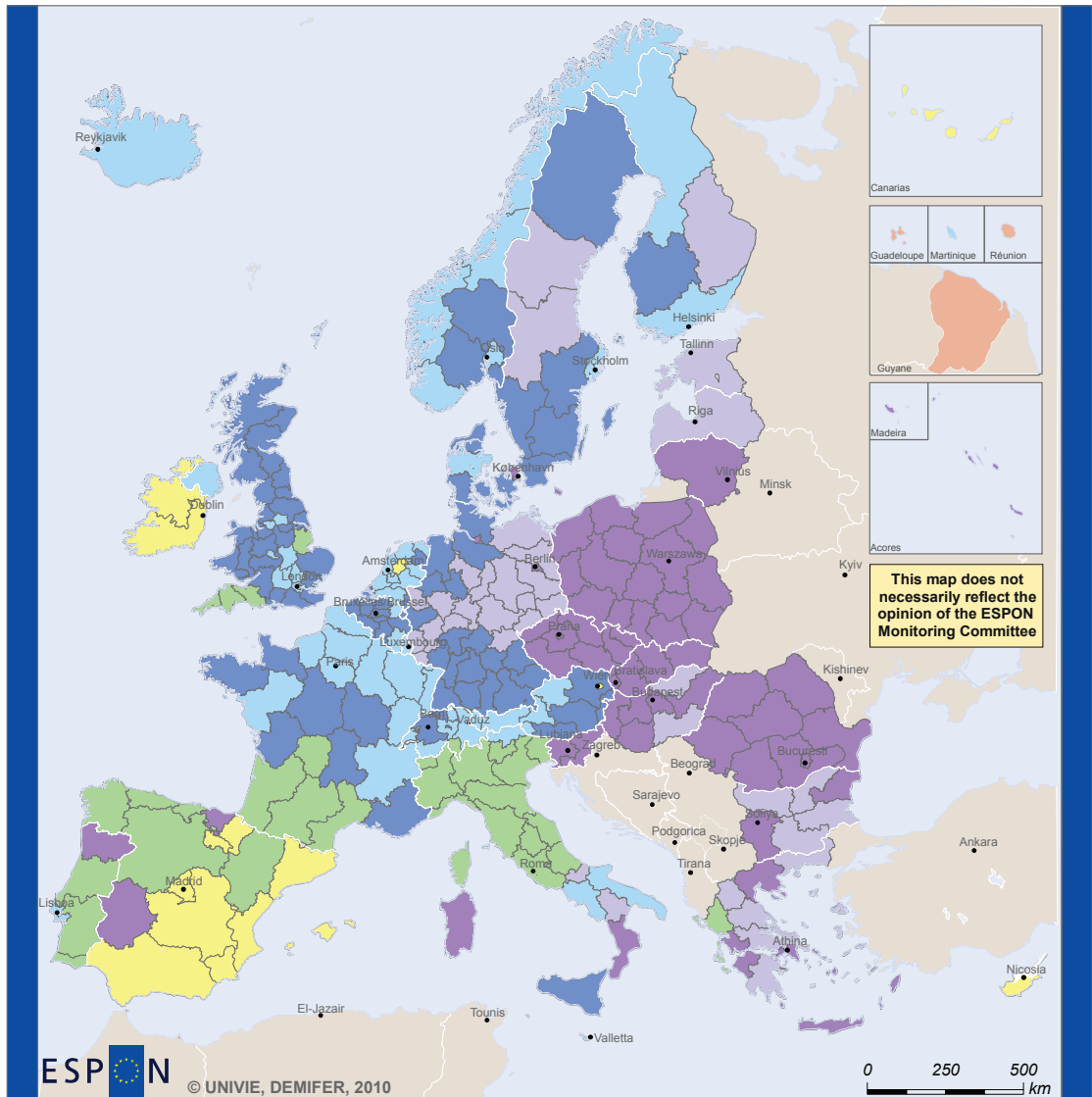
It goes without saying that there are substantial differences in demographic profiles between countries and regions. Considerable challenges are expected for three types of regions:

- The “Challenge of Ageing” regions experience positive population development driven by a positive net migration rate. Therefore they have increasing population numbers, but, the proportion of the older age groups is significantly higher than in others parts of the ESPON space. Education attainment levels are relatively low, but so are unemployment rates (although the gender gap in economic activity is the widest in Europe). A high share of elderly people and low education levels could impair the functioning of regional labour markets and constrain development of the regional economy.
- The “Challenge of Labour Force” regions are characterised by a rather high share of young people, but there is a mismatch between their numbers and aspirations and the employment opportunities in the region. Thus, despite a large potential work force, this type of region is losing population, both through a negative natural population balance and through migration. A low total fertility rate exacerbates the out-migration and population decline.
- The “Challenge of Decline” regions have a negative population development, due both to low total fertility rates and negative net migration. These are some of the shrinking regions of Europe. The proportion of older workers (above 55 years) is significantly higher than in the rest of the ESPON space and the share of younger adults (20-39 years) is below average, thus leading to a potential problem in maintaining sufficient workforce to sustain social welfare systems.

The last two types of regions are distinctive to the EU-12 and the eastern part of Europe, as well as shrinking regions in peripheral areas of northern and southern Europe and in Germany. In general their GDP per capita is below average. The share of migrants as well as labour force participation is also below average. In most of these regions (especially the Challenge of Ageing) the proportion of highly educated people is lower than the ESPON space average.

European level analysis obscures the intra-regional variations and dynamics. On top of the European level trends, there are also local demographic development trends which often may imply growing intra-regional disparities in demographic patterns. Even in regions facing demographic difficulties attractive urban centres and commuter areas may experience positive developments. In contrast within less attractive areas the situation in some parts is even more problematic than it appears on a European map.

Map 13. Typology of the demographic status, 2005



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Regional level: NUTS 2 except UK1, NUTS1  
Source: ESPON 2013 Database, 2010  
Origin of data: Eurostat, NSI, 2008-2009  
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Type	Classification	Cases	Population		Age group 20-39 (%)			Age group 65+ (%)			Natural population increase (per 1000)			Net migration (per 1000)		
			Thousands	%	avg	min	max	avg	min	max	avg	min	max	avg	min	max
1	Euro Standard	79	127 915	25,41	25,68	22,57	28,72	17,46	15,33	20,30	0,01	-2,67	2,47	3,43	-2,11	9,36
2	Challenge of Labour Force	61	116 768	23,20	30,43	28,33	33,84	14,51	10,60	18,96	-0,78	-4,76	2,89	0,08	-7,35	9,19
3	Family Potential	55	104 557	20,77	28,15	24,80	36,32	14,57	11,13	16,96	3,72	1,06	9,00	2,12	-3,51	9,59
4	Challenge of ageing	33	63 838	12,68	26,87	21,52	31,19	20,83	18,51	26,51	-1,74	-6,19	1,43	9,42	4,14	16,99
5	Challenge of decline	38	50 167	9,97	26,32	21,47	30,04	19,49	15,89	22,55	-3,39	-10,35	-0,59	-1,20	-11,25	3,70
6	Young potential	15	38 543	7,66	32,26	29,36	35,86	14,45	8,70	19,03	3,61	-0,15	9,78	17,10	9,96	26,30
7	Overseas	5	1 555	0,31	30,40	27,02	32,55	9,04	3,71	11,81	13,56	8,40	25,28	-1,78	-8,18	9,07
<b>EU27+4 ESPON Space</b>		<b>286</b>	<b>503 342</b>	<b>100</b>	<b>27,82</b>	<b>21,47</b>	<b>36,32</b>	<b>16,63</b>	<b>3,71</b>	<b>26,51</b>	<b>0,33</b>	<b>-10,35</b>	<b>25,28</b>	<b>3,16</b>	<b>-11,25</b>	<b>26,30</b>

In 2005

Average 2001-2005

The map distinguishes seven types of regions which are affected differently by demographic and migratory flows. The work is based on four indicators (share of people aged 20-39, share of people aged 65+, natural population increase and net migration). The seven types are:

- Euro standard is close to the overall average of the ESPON space. A stagnating natural population balance, but a positive net migration rate is prevalent.
- Challenge of labour force features a high share of population in young working ages and a slight population decline, driven by a negative natural population development.
- Family potentials has a slightly younger than average age structure and high natural population increase, as well as a positive migration rate.
- Challenge of ageing is characterised by older population and natural population decreases. Nevertheless, the overall population size is still increasing due to a strong net migration surplus.
- Challenge of decline is shaped by a negative natural population balance, as well as a negative migratory balance. In consequence, this leads to depopulation accompanied by demographic aging.
- Young potentials feature a young age structure, a positive natural population increase, as well as a strong migratory balance.
- Overseas is typified by high proportions of young people and by far the lowest share of the elderly. Thus strong natural population increase is more than counterbalancing the negative migratory balance.

#### **International European migration**

Free movement of people is one of the cornerstones of European integration. The analysis of migration flows between the countries of the ESPON space in 2006/07 reveals the main migration routes. Almost 2 million people a year moved from one ESPON country to another.

The main axis of migration flows is between Germany and Poland. Between these two countries the highest level of gross-migration has been registered. This is followed at some considerable distance by the migration flows between Romania-Spain and Romania-Italy. Furthermore, there are considerable migration flows between the UK and Spain and the UK and Poland.

There are also remarkable differences in the diversity of migration. Of all the bilateral flows, the im- and emigration between Poland and Germany and between the Czech Republic and Germany are over 50% of all intra-ESPON migration flows for both Poland and the Czech Republic. In contrast, in the Netherlands, Latvia, France, the UK and especially in Sweden the intra-ESPON im- and emigration pattern is more geographically spread and no singular main flows can be identified.

In addition to the intra-European migration illustrated, there is also a considerable immigration to the ESPON space from other parts of the world. At the national level 51% of all international migration flows occurred between two ESPON countries, and 49% of the flows were to/from non-ESPON countries. There are some remarkable differences between the countries. For example in the Czech Republic and Spain over 60% of all immigrants and emigrants came from outside ESPON countries. In contrast only a minor share, namely less than 10%, of immigrants and emigrants to/from Luxembourg are non-ESPON ones.

The age structure and demographic perspectives of the EU neighbouring countries may imply increasing immigration pressure in the EU. Population forecasts up to 2030 project significant demographic differences, with declining population figures for the ESPON space and high rates of population increase in the South-Mediterranean regions (Maghreb and Turkey), and with even higher rates south of the Sahara and in the Persian Gulf. Egypt, Turkey and Iran are all expected to have considerably more inhabitants than Germany by 2030. Whereas the population numbers in Germany are expected to be more or less stable, Egypt is expected to grow by 50 million people, Turkey by 27 million and the Iran by 26 million – just to give a few examples. Assuming persistent differences in wealth between the ESPON space and its neighbouring countries, there will be a growing immigration potential next door.

#### **Internal migration**

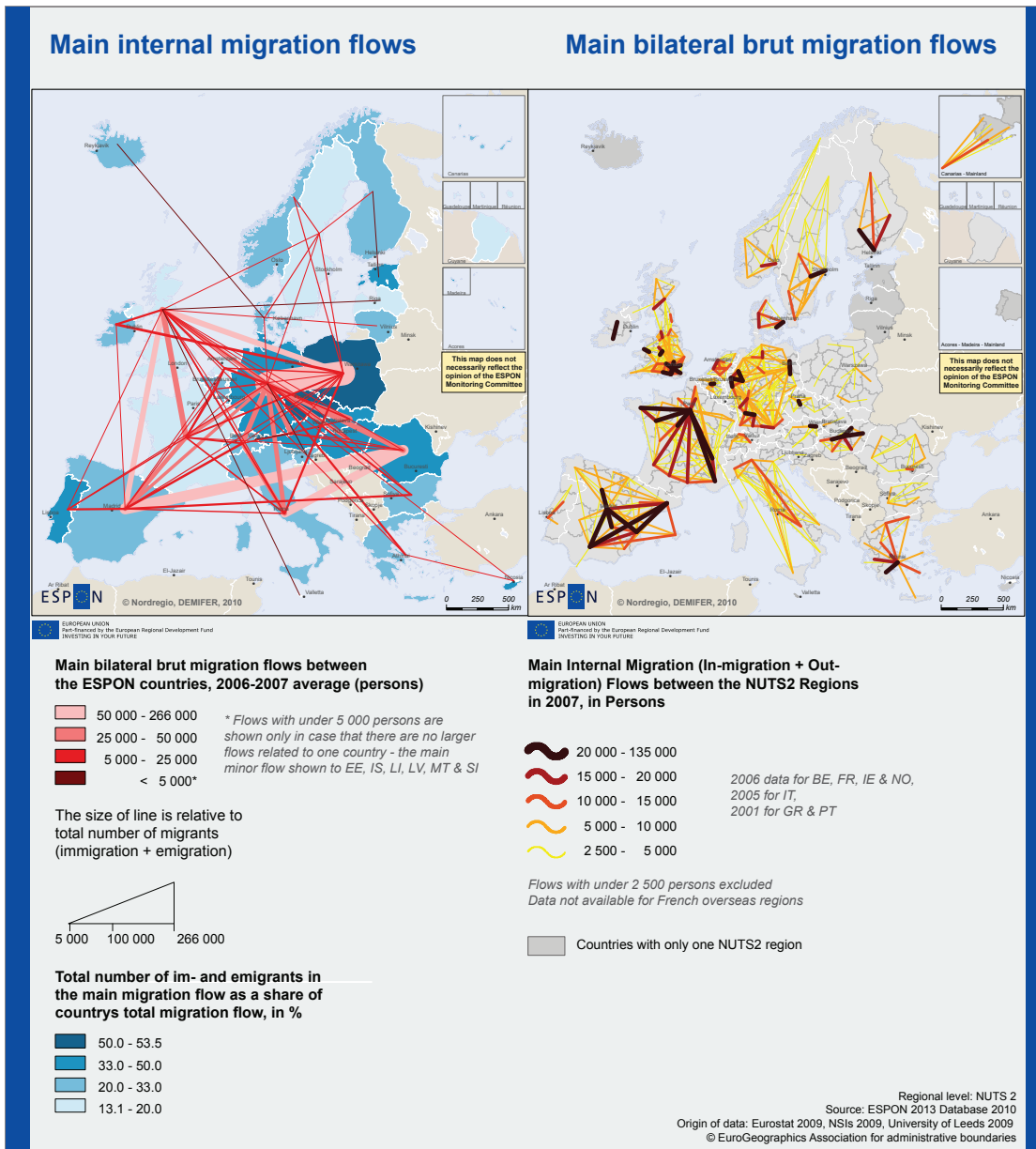
In the ESPON space 6.5 million people moved from one NUTS2 region to another within the same country in 2006. Looking at migration flows within countries, once again the dominance of the capital cities and larger metropolitan areas is visible. This is, for example, particularly evident in the case of Paris, London, Madrid, Barcelona, Budapest and Helsinki.

Furthermore, differences between countries can be observed:

- Some countries have only very limited domestic migration flows, e.g. Poland which on the other hand is prominent in intra-European migration. The reasons for this are manifold. Partly this can be explained due to slow urbanization which blocked the movement of people from rural to urban regions, so international migration substituted for internal migration.
- Some countries have large internal migration flows mainly between neighbouring regions. Examples for this are the Czech Republic and Austria. Also in Germany and the UK the migration flows over short distances dominate. These migration flows are mainly the effects of urbanisation and sub-urbanisation processes, i.e. migration between the urban centre and its wider hinterland.
- In some countries the main domestic migration flows are all directed to one city, e.g. Paris in France, Athens in Greece, Budapest in Hungary, or Helsinki in Finland. These migration patterns very clearly testify to the strong dominance of the capital cities in the countries and the monocentric urban systems becoming even more dominated by the capital city.
- Other countries show rather polycentric webs of domestic migration flows with several cities being main receiving nodes. Examples for this are Spain, Italy and Germany. These migration patterns reinforce the polycentric urban systems in the countries.

At regional level, the differences go along lines of wealth and accessibility: affluent regions, including large agglomerations in Central and Eastern Europe, gain from migration whereas more peripheral and poor regions lose. At the same time, the domestic migration trends seem to reinforce the national urban systems and thus strengthen monocentric developments in countries dominated by the capital city, but support trends to more polycentric developments in countries which have several strong urban nodes. In the long run, these reinforcements of national urban systems also influence the structure the European urban system.

Map 14. Migration flows, 2006-2007





Net migratory trends at the national and regional level in the ESPON space give the picture of regions either gaining or losing population. This image can however be nuanced both in terms of the actual flows that occur and geographical patterns. In general the net migratory trends are showing just a minor part of the much larger constant circulation of people and networks between all countries and regions.

In the map on main bilateral gross migration flows all the 79 intra-ESPON flows with over 5 000 persons are shown. In addition six minor flows are shown in order to present the highest flow also to/from small countries where none of the flows were over 5000 persons. In absolute numbers the largest bilateral migration flows occurred between Germany and Poland (223 000 persons) and between Spain and Romania (102 000 persons). Also flows between Italy and Romania (76 000), Spain and the UK (52 000) and Poland and the UK (52 000) were notable.

When looking at the main flows with over 2 500 persons, like in the map on main internal migration flows 658 main internal gross migration (in- and outmigration) flows between the NUTS2 regions can be identified. In 38 of those regions the total number of migrants were over 20 000 persons. Major European cities, London, Paris and Madrid, dominate these flows, but high concentrations can also be found in many other capital regions and especially to/from Budapest. Outside the capital regions high mobility can be identified in the Ruhr region and to/from Barcelona. In absolute numbers the highest migration flows can be identified between Inner - and Outer London (135 000) and between Madrid and Castilla La Mancha (57 000).

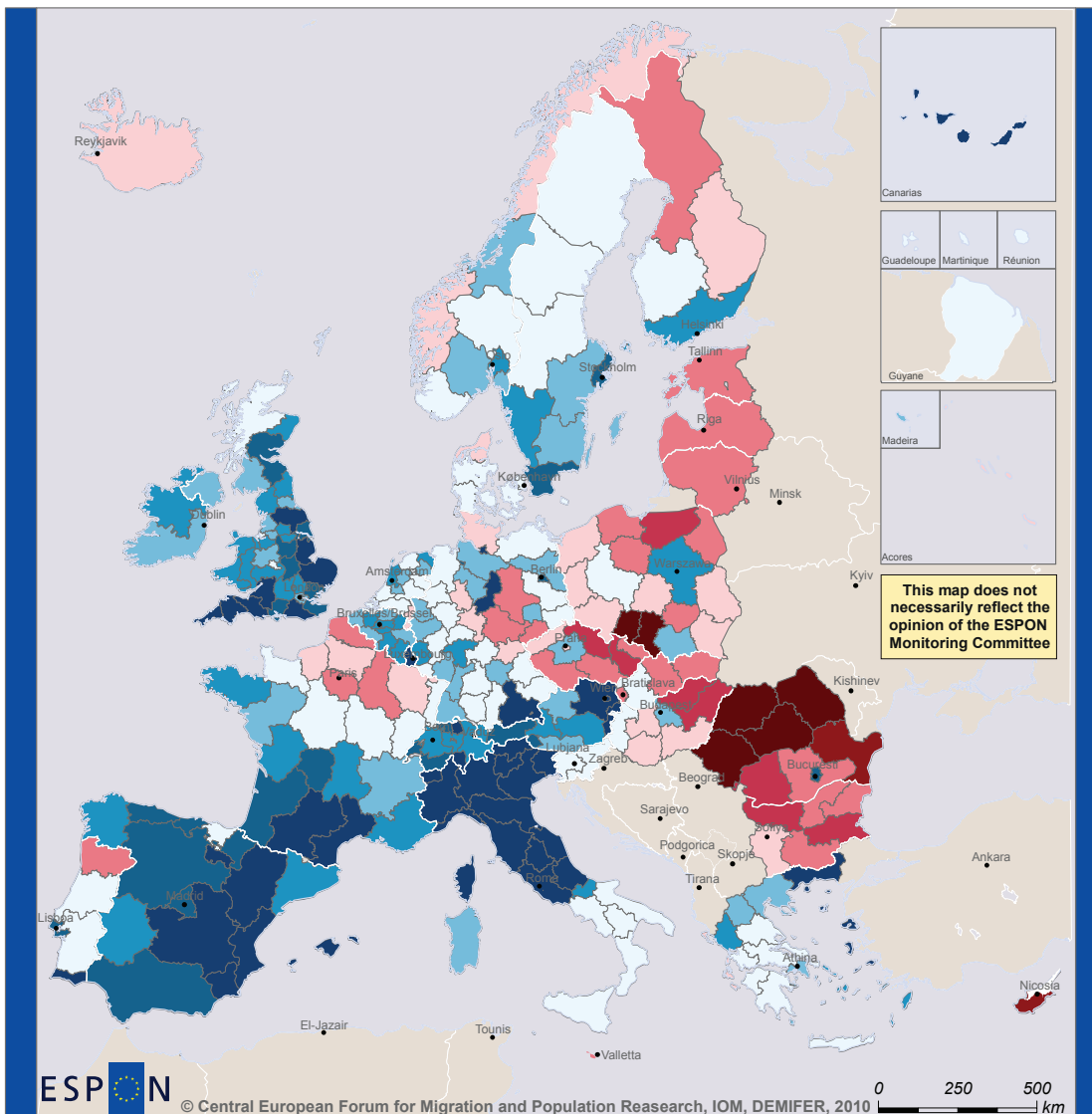
#### **Expected territorial migration effects**

In many European regions demographic growth or decline is strongly influenced by migration flows. Taking into account the different migration flows and their impact on population developments, the overall change of population because of migration has been calculated at regional level for the year 2050.

A vast majority of the regions gain population because of migration. In 24% of the regions, 2050 population would be higher by 30% or more compared to a no-migration scenario. In the EU15 almost all regions, except those in north-eastern France, north-eastern Finland and in Sachsen-Anhalt and Thuringia profit from migration. The most profound gains would take place in Italy north of Naples, some south-eastern regions of Spain and southern France (all forming a broad Mediterranean crescent), and the east and west England. They will be fed from three sources, extra-European migration, international intra-European migration and internal migration. The European regions which would pay for these gains are located in the east, especially in Romania and Poland. Internal migration also plays a role and would fuel for example the increase of Bucharest, Mazowsze and the hinterland of Prague.

Reading the map one needs to remember that it only reflects the gains and losses caused by migration. For the total picture on population development the natural population development also needs to be considered. In contrast to the migration picture, these tend to be negative in large parts of the ESPON space.

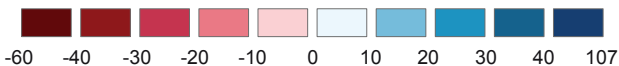
Map 15. Impact of migration on population in 2050



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Regional level: NUTS 2  
Source: ESPON 2013 Database, 2010  
Origin of data: Eurostat, NSIs, estimations, 2010  
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**Impact of migration on population in 2050\***  
**Difference in population in %**



\*Impact of migration on population in 2050. Calculated as the difference in population in the Status Quo and No Migration scenarios in % of the population in the No Migration scenario

To assess the impact of migration on the population and labour force in the period 2005-2050, three reference scenarios have been calculated.

1. Status Quo: what would happen if the demographic regimes of year 2005 continued unchanged until 2050?
2. No Migration: population of the regions changes due to births and deaths only.
3. No-extra Europe migration: population changes naturally and due to internal and international intra-ESPON space migration.

Under the Status Quo scenario the population of Europe would decline by 40 million over the 45 years and migration would have a significant impact on demographic and labour force development as well as on the age structure of regions. Without changes in demographic and migratory flows, one third of the regions will face considerable population decline (more than 20 per cent by 2050).

The map shows the impact of migration calculated as the difference in population in the Status Quo and the No Migration scenarios. The figures are in percent of the population in the No Migration scenario.

### 3.3 Energy challenges

Energy shapes many different aspects of territorial development, and many territorial indicators can be directly or indirectly linked to energy issues. Future access to energy supplies is a growing concern, with Europe's economy and society in general remaining highly dependent on energy, while at the same time fossil energy resources are becoming scarcer and more expensive. In addition, energy has an important environmental dimension, a theme explored in Chapter 4. The possibilities to secure future energy supplies and also the importance of energy prices for economic development vary across the ESPON space.

As a whole, Europe has become less dependent on imported energy over the past two decades. This is however significantly influenced by the contribution of Norway, which produces 9 times more energy than it consumes. In contrast the smaller European countries have severe levels of energy dependence (for example, Luxembourg, Cyprus and Malta produce less than 2% of their energy needs through their own domestic resources). A further five European countries (Belgium, Spain, Ireland, Italy and Portugal) have resources sufficient only to produce barely 25% of their energy needs.

Sensitivity to changes in energy prices depends on how efficiently energy is used. EU15 uses 50% more energy per capita than EU12, but in relation to GDP producing one Euro of income in EU15 takes only 30% of the energy needed to do so in EU12. Accordingly, EU12 countries are, in general, more liable to suffer negative impacts from a rise in energy prices. This is mainly because of the high energy intensity of their industrial processes and the low energy conservation levels of their building stock. Germany, Austria, Ireland and Greece seem to be well placed regarding possible energy price shocks, though the reasons for this may be substantially different: basically, favourable climate and light industries in Greece, and energy efficient use in the others.

In case of high and volatile energy prices, a pattern already experienced, access to energy would become a critical aspect of regional development, with important consequences for economic structures and physical mobility. All regions, but especially those with high energy dependency, would need to find ways to manage a transition towards resilience.

Territorial differences exist both in energy supply conditions and in energy consumption. For end-users, energy prices vary from country to country and more significantly from region to region. Territorial differences in energy consumption are related to both the energy intensity of national economies and to the welfare level of countries. More developed countries generally have lower energy intensity per unit of GDP produced, but higher energy consumption per capita. Higher energy prices manifested through increasing transport costs have most severe impacts on the accessibility of more remote and peripheral regions. Road and air transport modes are most affected.

In addition to the direct consequences, the risk for relocations of industries because of differences in energy prices has been studied. Particular attention has been given to the idea of “carbon leakage”. This refers to the possibility that companies decide to transfer their production facilities to countries outside the ESPON space if production costs rise as a result of carbon taxes. Regional employment in sectors at risk for carbon leakage provides a first indication of where the possible future picture.

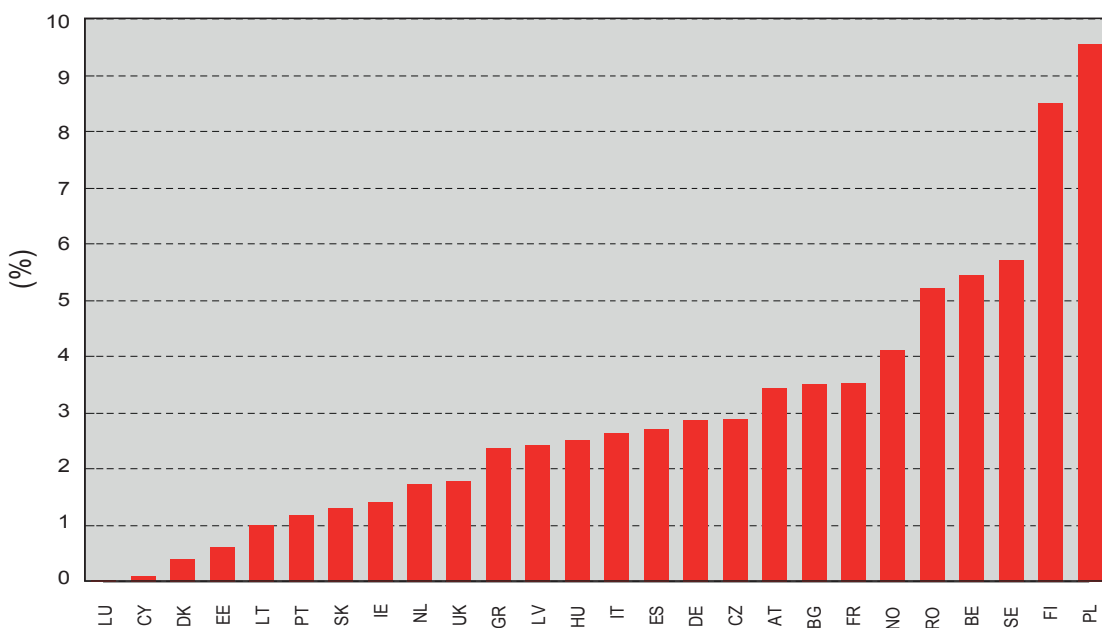
Carbon leakage seems to be a major concern for the Belgian provinces of Brabant Wallon and Antwerpen. This is because of the high employment figures in manufacture of other organic basic chemicals and manufacture of fertilizers and nitrogen compound, since these spend more than the EU average on energy purchases. The British regions of East Yorkshire and Northern Lincolnshire also might be exposed to the risk of carbon leakage by companies manufacturing other inorganic basic chemicals, which do not perform well with regard to the subsector’s average energy expenditure.

Antwerpen, East Yorkshire and Northern Lincolnshire are among the regions, which might face the greatest challenges in terms of competitiveness in a situation of rising energy prices. They have most challenging industrial structure, due to their high levels of energy spending.

In addition to energy-intensive regions, such as regions with industries with high energy purchases, there are other types of regions which could be concerned in particular with the social impact of expensive energy. Energy poverty is a threat in regions with high unemployment rates and/or low disposable income. Furthermore, regions dependent on long-distance freight transport (including islands and remote areas), regions relying on high levels of commuting, as well as tourism-dependent regions could all face economic turbulence should energy prices again rise steeply.

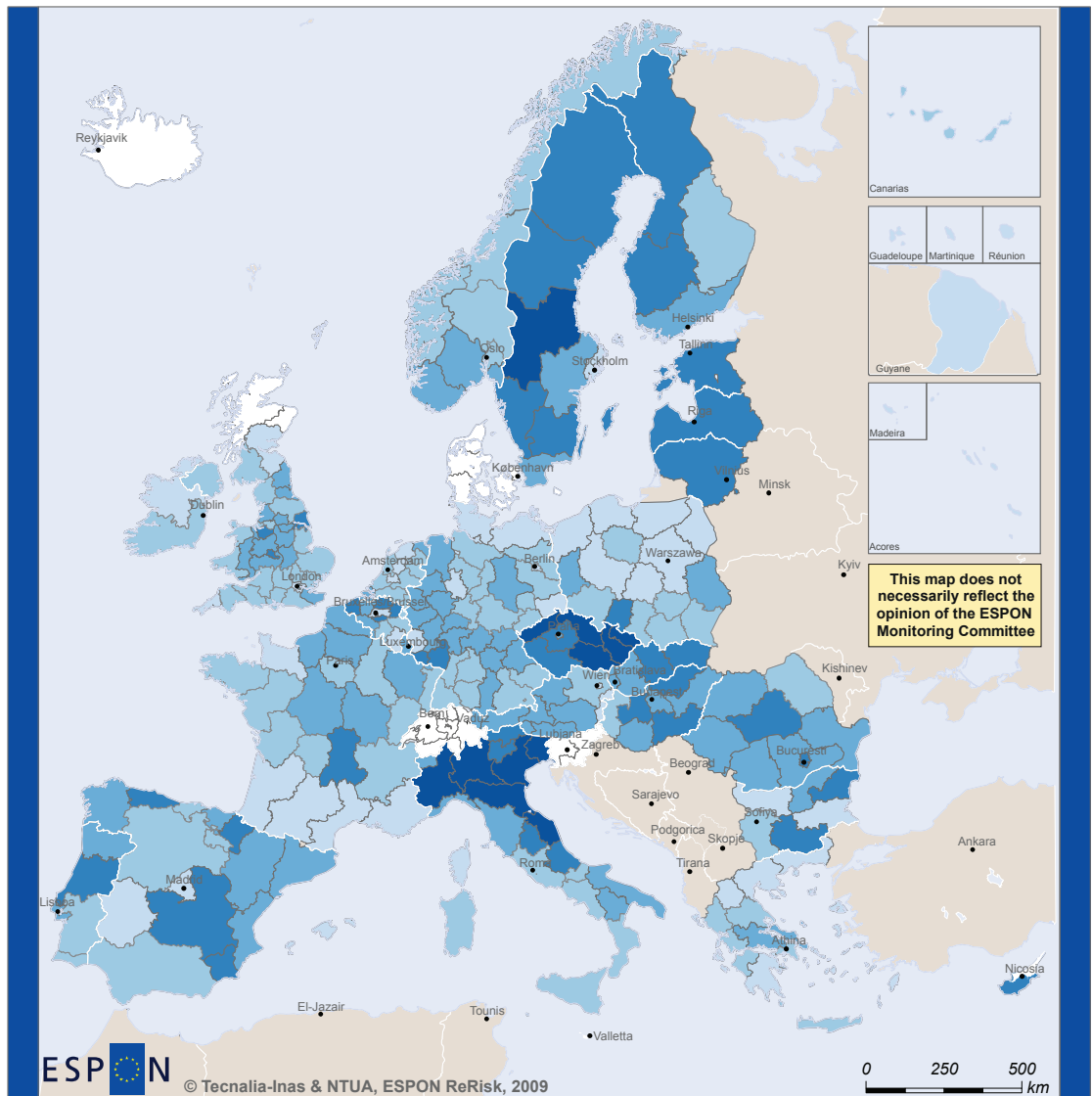
However, changes in relative energy prices can also open development opportunities for regions able to capitalise on their potential for renewable energy production and/or to nurture innovative energy related industries.

**Employment in sectors at risk of carbon leakage as percentage of industrial employment, 2005**



Source: ESPON 2013 Database, 2010  
 Origin of data: Directive 2003/87/EC, Eurostat Regional Statistics, 2005  
 © ESPON ReRisk, 2009

Map 16. Proportion of employment in industries with high energy purchases, 2005



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Regional level: NUTS 2  
 Source: ESPON 2013 Database, 2010  
 Origin of data: Eurostat, 2010  
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**Share of employees in industries with high energy purchases in 2005 (%)**



No data

Due to the reliability and quality of the datasets behind this map, the Lead Partner of the ReRisk Project decided not to include data collected from other sources than Eurostat

The map shows the share of a region's total labour force which is employed in industries demanding a lot of energy. Thus it gives a picture of regional dependence on industries with high energy spending. The regions with the most unfavourable position in terms of economic vulnerability (> 10% of employment in industries with high energy spending) are located in the Czech Republic and in Italy. In the latter case, the highly vulnerable regions combined represent more than 50% of industrial employment. However, the Italian industries do not perform badly in the EU comparison with regard to energy spending, despite of the relatively high energy prices in the country.

### 3.4 Geographical challenges

Some development challenges can derive from geographical location, including e.g. rural areas, and regions which suffer from severe and permanent natural handicaps such as the northernmost regions with very low population density, island, cross-border or mountain regions.

ESPON's research reveals some common features although the detailed situations vary greatly. Most importantly, the perceived challenge depends on the geographical level of analysis. Islands, mountainous and peripheral regions are all characterised by relative smallness and remoteness, but also by internal diversities. When research is focused on the local scale it quickly encounters wide territorial and socio-economic diversity within the regions. Similarly, the potential for development that these regions have is also diverse, both within a category like "island regions" and then within an island itself.

#### **Low accessibility and small markets**

Smallness and remoteness combined create an economic disadvantage compared to other regions; firms in remote regions that have a small number of inhabitants cannot draw on economies of scale for labour and consumers in the way that competitors in a big city can. Low accessibility is strongly linked to small internal markets. Although there is a considerable diversity of settlement patterns in remote regions with sparse populations they all are characterised by territorial unbalances and low connectivity to larger cities.

ESPON case studies found that in the Nordic Countries, low accessibility to large markets and poor possibility for regional enlargement were explicitly identified as disadvantages for specific territories. In Switzerland, the fact that the mountainous and rural communities are often small isolated communities was highlighted. In the case of Gozo (Malta), there is a double territorial constraint – it is an island off an island. This geography both limits the possibility of movements of resources and imposes additional transaction costs on the local economy. In Cyprus also, the island geography translates into relatively high operational costs. In peripheral Romania, the poor state of basic infrastructure (notably roads, water supply, and health care) and the high costs of operations of services are barriers to development.

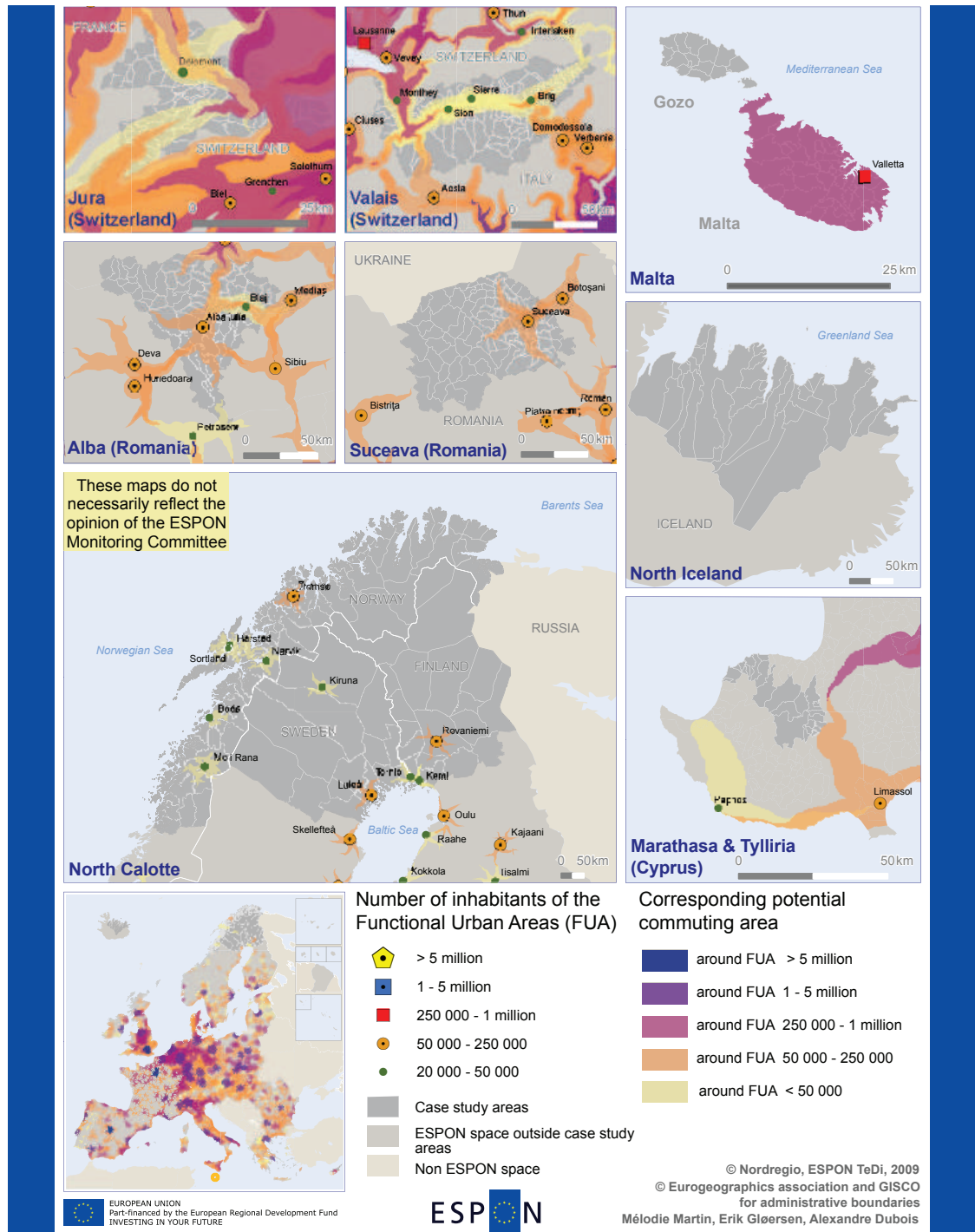
#### **Importance of rural-urban linkages**

Overall, the challenge for these areas is not accessibility as such, but the identification and tackling of obstacles to balanced and harmonious territorial development in terms of infrastructure. This is closely related to the connectivity to the nearest urban centres and hubs. Better urban-rural connections and easier commuting over wider distances are seen as strategic measures to create wider, more robust labour market areas and to facilitate access to services.

These issues of internal coherence are however quite different depending on the scale of the case study areas. In the North Calotte, the lack of air connections between the Finnish, Norwegian and Swedish parts as well as the potential for developing east-west connections from Russia to the Norwegian Sea. In most of the other case study regions, the focus was on insufficient connections between urban and rural areas. At the other end of the scale, in Marathasa and Tylliria, the local connections that could boost the economy extend out beyond the study area itself.



Map 17. Access to urban nodes - Case Study on areas with geographical challenges





The maps look at regional settlement structures based on access to urban centres. They show areas within 45 minutes travel time to the centres of the functional urban area with more than 20,000 inhabitants (defined in previous ESPON studies).

The canton of Jura in Switzerland is a medium altitude mountain area, with relatively good connections to the neighbouring metropolitan region of Basel, to Berne and to Belfort in France. However, within the Jura, Delémont is the only urban centre. It has just over 20,000 inhabitants, but the canton has access to numerous external centres of major difference. The main challenge is therefore the positioning of this predominately rural region that is in close proximity to urban poles.

The canton of Valais in Switzerland is central in a European context. It is inside the Pentagon, but because of the topography it is separated both from the neighbouring Italian cities to the south and from the dynamic Swiss Mittelland plateau to the North. The Valais has a series of small urban centres which are the centres of regional development, with all the industrial and tourist assets associated with high altitude mountain regions.

Malta offers an example of an insular nation state, which with its small size and high population densities faces particular development challenges. Despite being situated only 25 minutes by boat from Malta, Gozo has distinctly lower levels of economic performance. The difference between Malta and Gozo is quite obvious. All of Malta is within daily commuting distance from Valetta, whereas Gozo remains outside and suffers from a “double insularity”.

The county of Alba in Romania lies in the extensive human settlements at high altitudes (above 1000 m). Household incomes are sustained by multi-activity combining agriculture, the production of handicrafts and tourism. It also offers examples of conflicts in environmentally sensitive mountain areas, e.g. between mining, tourism and conservation.

The county of Suceava in Romania is an example of a traditional agricultural region. It is also a border region, as part of the historic region of Bucovina which extends into the Ukrainian oblast of Chernivtsi. The lack of infrastructure and the absence of basic public and private services raises the question of the relevance of a focus on geographic specificities in territorial policies in areas with major structural challenges.

North Iceland is also peripheral and has low population density, but within an insular national context. As part of a country particularly hard hit by the global financial crisis, it also offers some evidence on the role a remote area specialised in primary activities (fisheries) has had to adopt.

The North Calotte, grouping the northernmost regions of Finland (Lappi), Norway (Nordland, Troms and Finnmark) and Sweden (Norrbotten), is an example of an extremely sparsely populated region with abundant natural resources, high living standards and satisfactory to high economic performance levels from a European point of view. However, only a minor proportion of the area is within commuting distance of an urban centre.

Marathasa and Tylliria are sparsely populated and poorly connected areas of northwest Cyprus, whose relative isolation has been accentuated by the Turkish occupation. Part of their specificity derives from being beyond commuting distance from Nicosia, Limassol and Paphos. As sub-regional entities with no separate administrative status, these areas illustrate the need to look below the level of statistical regions to identify geographic specificities.

#### **Access to services**

In all the countries investigated by this targeted ESPON analysis, the specific territorial characteristics seems to have substantial impact on the capacity of the nation-states to deliver the same level of access to services in all parts of the national territory. This has an impact on both private persons and businesses.

In the Swiss cases, the high costs related to the provision of services (health care and education) are particularly emphasized. In addition, the business structure (SMEs) and remoteness from higher education centres (universities, polytechnics) engenders a chronic lack of public and private R&D and innovation capacity. Difficult access to essential services is also an issue in Gozo. However, there are situations where private investors spot an opportunity and successfully provide services to a widely dispersed population. The most notable example is the Haparanda-Tornio shopping centre on the Swedish/Finnish border in North Calotte. Situated in a town with a labour market area of only 34 000 inhabitants, the IKEA shop of this shopping area alone attracted over 2 million visitors during its first year of operation in 2005 from all over the North Calotte. This implies that many visitors were prepared to travel up to 7 or 8 hours one-way to reach such a shopping centre.

#### **Limited potentials for economic diversification**

In all cases studied, the regional economies of the “specific territories” imply limited potential for diversification of the economic base.

In the Swiss cases there is little alternative to the tourism industry in mountainous areas. Similarly, the dependence on agricultural activities in Gozo and the fragility of this sector poses a problem. In Cyprus as well, the low incomes generated by agriculture, along with a lack of employment opportunities outside the agriculture sector, make the rural territories more vulnerable. Climatic constraints (drought in the south and cold in the north) also affect the capacity to sustainably develop activities based on the exploitation of the land. In Romanian mountainous areas (belonging to the category rural areas), agricultural activities, essentially consisting of small subsistence or semi-subsistence farming, are an important source of employment, though diversification of economic activities remains difficult.

#### **Demographic/labour-markets challenges**

In the case studies, depopulation and concentration of the population within the specific territories was considered a source of insecurity, not just for the present but also for their future development. In Cyprus and the Nordic Countries, the trend is out-migration to cities. In Romania, the combined effects of aging and depopulation are especially felt in rural and mountainous areas.

#### **Are all rural areas challenged areas?**

In Europe, there are some wealthy rural regions and some urban regions with poverty, high unemployment and land poisoned by past industrial activity. Thus rurality by itself is not necessarily a problem of development. Too often thinking and policy about rural Europe has been shaped by stereotypes, which seems to overstate the significance of agriculture in a rural region’s economy, or understate the accessibility to major urban centres that many rural regions now enjoy. Therefore, different types of rural regions need to be distinguished.

- Rural regions in which the primary sector plays a major role in the local economy are mainly concentrated in an arc stretching around the eastern and southern rims of the ESPON space.
- Some other rural areas have an economy where tourism is more important than agriculture. In such places the countryside is less about production and more about consumption, where people come to access natural areas. These Consumption Countryside regions typically have diversified small scale infrastructure. They are most prominent in Northern Europe and also Germany, Austria, Slovakia and Italy.
- The rest of the ESPON space is characterised by a patchwork of rural areas: (a) diversified regions with a focus on secondary sector services (again contrary to the stereotype, there are rural regions with quite a lot of manufacturing, not all of it about processing local farm produce) and (b) and diversified regions with an economic focus on private sector services, in other words with an employment structure not very different than that found in urban regions. This latter group is especially strong in France and not surprisingly it is most common in the most accessible rural areas which an urban economy can most easily penetrate.

Rural regions characterised as consumption countryside regions and diversified regions with a focus on private sector services usually achieve a good level of economic performance and are likely to continue to do well in the immediate future. This new typology enhances the ability to distinguish between non-urban regions in terms of their economic performance. This represents a distinct step forward from relying on outdated assumptions about the nature of rurality, and shows how evidence and analysis could support reshaping development policy.

Although these generalised statements can be challenged by local variations within rural areas, they show why the diversity of rural areas makes it essential to look beyond the old stereotypes that emphasise rural disadvantage. Thus it is necessary to look beyond just agriculture and other primary sectors activities like forestry, and to focus instead on potentials inherent in an integrated rural development approach. Latent territorial capital in different types of rural regions can be a basis for bottom-up growth that contributes to regional, national and European recovery.

Traditionally the assets for rural development are discussed along the lines of (a) soft and hard assets ranging from infrastructure to human capital and environmental amenities, (b) private and public goods differentiating the ownership structure from the assets (e.g. hotels from landscapes). However, what is actually needed is the smart combination of these assets e.g. with regard to innovative milieus, business networks and place marketing.

Rural development support requires an evidence-informed mix of a wide range of policies from different sectors, not just agriculture, and different levels of decision making. Overall, to successfully support the development of rural areas these policies need to acknowledge the importance of a number of key factors:

- Policy mixes that differentiate between different types of rural areas.
- Rural-global links which are of increasing importance.
- Consideration of the local development context and environments.
- Links and good accessibility to the nearest urban centres
- Recognition of the trajectory of economic restructuring in rural areas.

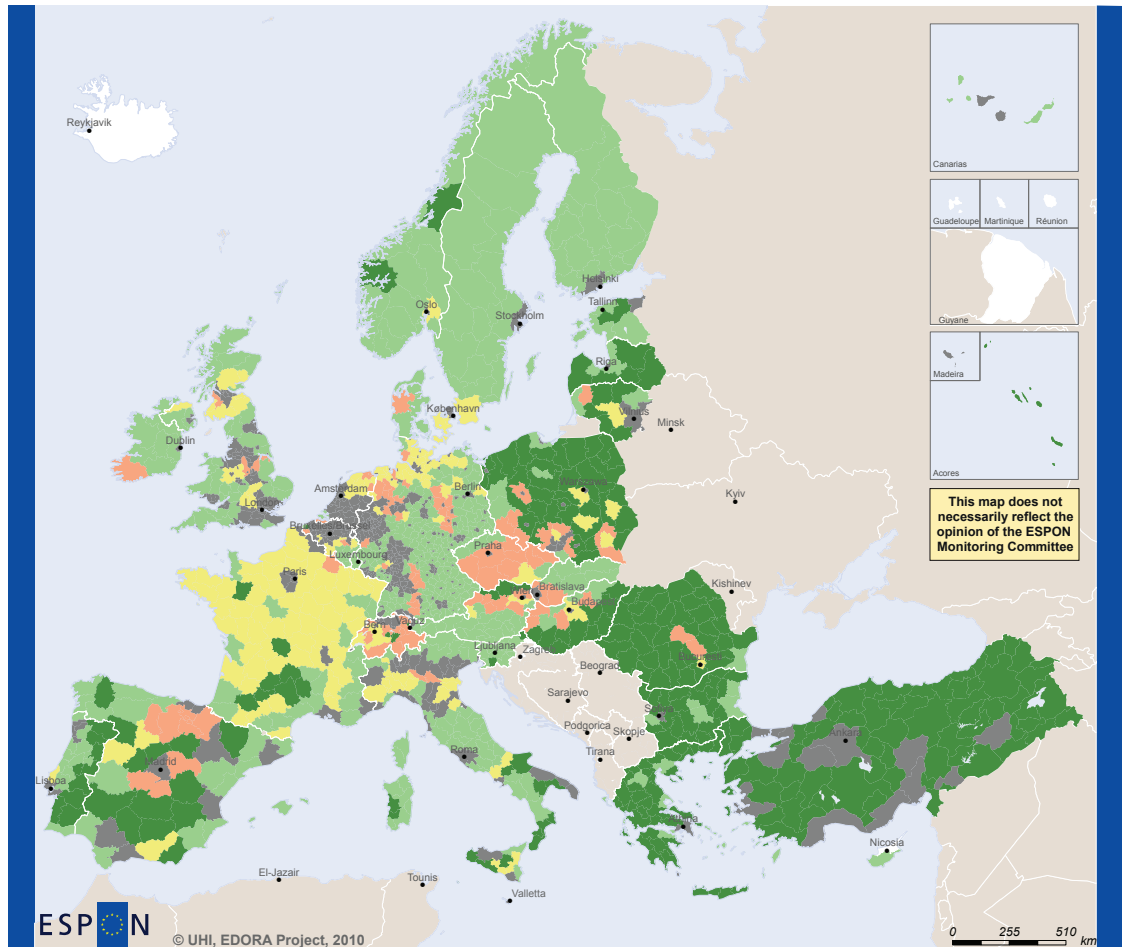
Moreover, the local drive for change seeing new potentials for economic development and job creation should be encouraged. In particular, the diversification of their economic base would be a lever for these specific territories. Here the expansion of global markets and climate changes should also be considered as offering new development opportunities.

The development of the structural types reflects the importance of countryside public goods and the concept of the consumption countryside. The maps shows the regions' rural characteristics, however, many of the regions have urban economies which are not necessarily reflected in the rural characteristics presented.

Agrarian regions are those in which all three indicators of the relative importance of agriculture (% employment in primary sector, % of GVA from primary sector, and Agricultural Work Unit as share of total employment) exceed the EU27 non-urban region mean. These are regions where agriculture is still significant economically. They tend to be losing people and economic vitality, though there are exceptions to this generalisation.

Consumption countryside regions are defined by eight indicators, in three groups relating to tourism capacity and intensity, access to natural areas, and small scale and diversified agriculture. They tend to be high performers that have potentials to grow both demographically and economically.

Map 18. Structural types of rural areas, 2006



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Regional level: NUTS 3  
Source: EDORA Database, 2010  
Origin of data: Eurostat Regio Database and other sources, various years (centred on 2008)  
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**Structural types  
(intermediate and predominantly rural NUTS 3 regions)**

- Predominantly urban regions
- Agrarian
- Consumption countryside
- Diversified (strong secondary sector)
- Diversified (strong private services sector)
- No data

Note: A simplified classification procedure was necessary in Switzerland and Turkey due to missing data. However it is anticipated that acquisition of a wider range of indicator would not materially change the outcome.

Crucially, the remaining regions are not only diversified but also need to be separated on the basis of the ratio of the GVA derived from secondary activities to that from market services. Those in which secondary activities are dominant are found in the Czech Republic, Hungary, Slovenia, around Madrid and in the north of Spain, in parts of Germany and the English Midlands. Diversified (market services) regions are conspicuous in northern and central France, but are also scattered across northern Germany, northern Italy, parts of the UK, and close to national capitals in the east of the ESPON space.

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### 3.5 Challenged areas turning into success stories

Challenges are meant to be mastered. Challenged areas are not bound to endless development struggles, once their particular development objectives and comparative advantages and disadvantages have been identified. There are many cases where challenged areas developed into success stories. Common ingredients of such success stories are well managed governance processes and flagship projects which were able to break the downwards trend and act as leverage for other initiatives.

Barcelona and Valencia are among those frequently discussed prior to the economic and financial crises. These Spanish examples benefitted from the positive economic development Spain experienced until the crisis. The question is to what degree their success was shaped by this national economic development, and in particular by the boom in the Spanish construction sector that proved short-lived? The degree to which their progress can be maintained through the economic crisis remains to be seen.

However, when comparing the experience of Valencia with other convergence regions (e.g. East Macedonia-Trace in Greece, Podlaskie in Poland and Campania in Italy) it seems that the huge investments in Valencia's construction sector had considerable effects on the rest of the economy. One determining investment (which entailed many others) may have been the major infrastructure project to relocate the Turia river, which had flooded Valencia in the 1950s. After the relocation, the former riverbed was transformed into a huge park for the citizens, who decided against using the land for a city highway and instead opted for a green lung within the city. The 20-year-long park project has not only been important in regard to the financial investments but also improved the attractiveness of the city and quality of life for people. Nevertheless, the economic boost from this capital investment project was bolstered by the exploitation of other regional resources at the same time. Furthermore, Valencia invested in training for public sector officials, and this contributed to the success.

Targeted analyses performed by ESPON reveal several factors or preconditions which are important for the development of convergence regions. These are in order, accessibility, innovation and knowledge economy, economic structure and policies, quality of regional administration, quality of life, social aspects and political stability.

One could assume that it would only need one enabling spark, like the investment in the construction sector, coupled with good monetary and non-monetary incentives to escape a negative circle and enter into a positive helix of economic success. However, to find the “right spark” is not always easy.

### 3.6 Future perspectives – labour force scenarios

Future oriented policies not only need evidence about current territorial structures and developments. Future scenarios are increasingly used as a tool for territorial policy development. This is perhaps because scenarios can encompass discontinuities with past trends, and so help us to anticipate “shocks” and build resilient cities and regions.

Demography and migration prospects are normally a basic element in scenario processes. Natural population development is one important factor where a long term prognoses can be done with reliable and accurate quantitative results. However, migration is much more difficult to predict with confidence.

Among possible demographic scenarios including migration for the period up until 2050 at European level are:

- Growing social Europe shaped by growth enabled by technical and social innovation and increasing collectivism, with a moderate increase in inter-state migration and moderate levels of extra-European immigration and an increasing labour force participation rate.
- Expanding market Europe based on growth enabled by technical and social innovation and growing individualism, with a high increase in inter-state migration and also high levels of extra-European migration and an increasing labour market participation.
- Limited social Europe focusing on growth limited by environmental constraints and growing collectivism, with a moderate decrease of inter-state migration, low extra-European integration and decreasing labour force participation.
- Challenged Market Europe based on growth limited by environmental constraints and increasing individualism, with a low increase of inter-state migration, moderate extra-European immigration and decreasing labour force participation.

As noted earlier, under the status quo the population of the ESPON space looks set to decline by 40 million between 2005 and 2050. However, in all these four scenarios the total ESPON population remains steady or increases. The regional effects are still dramatic and all scenarios project increasing imbalances and concentration with a shift of the population from the poorest to the richest areas.

The Expanding Market scenario projects population increases for a wide range of regions. It sees most regions in Scandinavia, the UK, France, north and central Italy and south and east Spain in the top growth classes. Most of the eastern regions are projected to lose population but in the capital city regions of Warsaw, Prague, Budapest and Bucharest this loss is small. Also in the regions of western Germany, parts of northern France and western Spain the population decline is small. In the Growing Social scenario the effects are more even with fewer regions declining or growing heavily. In the Challenged Market scenario most regions show losses in population, while in the Limited Social scenario the variations shrink so that there are fewer regions losing dramatically.

Looking at the regional variation of population aging, the most hot spots of growth in working ages occur in the Expanding Market scenario, particularly in southern England, Ireland, north and central Italy, and south central Spain, and with lesser growth in France, Austria, other regions in Spain and the southern areas of the Nordic Countries. Regions in central and eastern Europe are projected to see declining numbers of people in working age. These declines expand in extent as one moves from the Expanding Market to the Growing Social scenario, to the Challenged Market to the Limited Social scenario. Indeed, they are most pronounced in the status quo scenario.

The situation with regard to the change of labour force figures is particularly striking. By 2050, a lot of regions will be having to cope with a shrinking labour force. Depending on the scenario the decline of the labour force will be less or more serious. There are some territorial patterns in common for the labour force development in all scenarios. Overall, Portugal and some neighbouring Spanish regions, southern Italy, Greece, East Germany and most regions in the countries which joined the EU during the last two accession rounds will face serious declines in the labour force. On the other hand Ireland, large parts of the UK, some regions in France, northern Italy and Spain will see a growing labour force. As for the other regions, the development differs depending on the scenario chosen, and in reality the picture will depend on how well or otherwise territories recover from the recession.

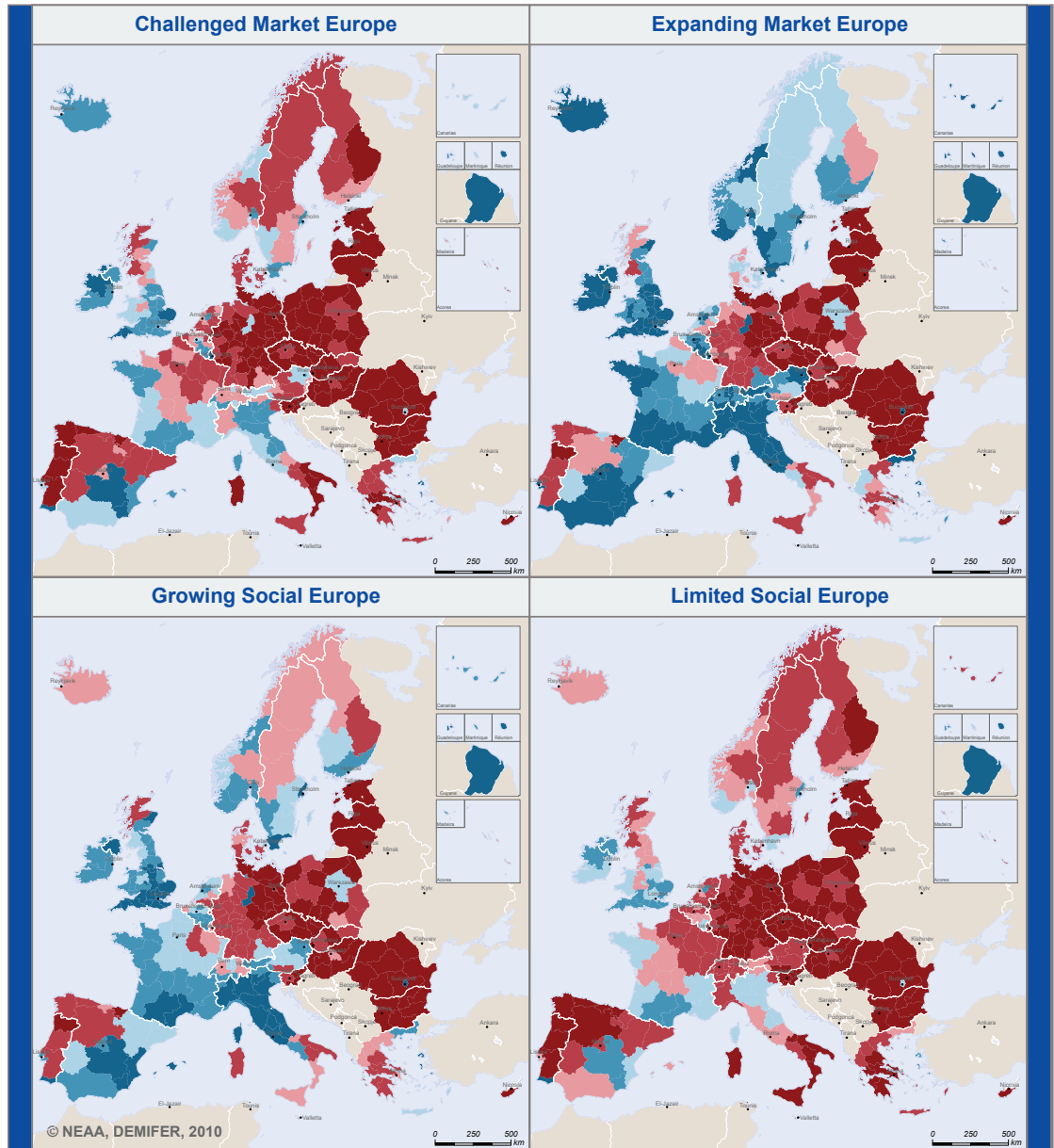
The overall picture indicates that the ESPON space faces a territorially diversified but nevertheless serious decline in labour force with all its challenges for the European social model and economy.

Between 2000 and 2007, the share of the population in working age (20-64 years) has decreased in some parts of the ESPON space and increased in most others. The areas that had the highest decreases are located in Bulgaria and East Germany, whereas the areas with the strongest increase in the share of working population are mainly in Spain, Ireland, Iceland, some regions in western France, and single regions in Portugal, Poland, Switzerland, the Benelux countries, Czech Republic, Slovakia, Scotland and Norway.

Whereas the present developments provide a rather positive picture for most parts of Europe, the expected future developments are less optimistic. In the Expanding Market scenario a minority of the regions will be facing a declining labour force. The labour force is expected to shrink by more than 10% between 2005 and 2050 in only 35% of the ESPON regions.



Map 19. Change in labour force 2005-2050



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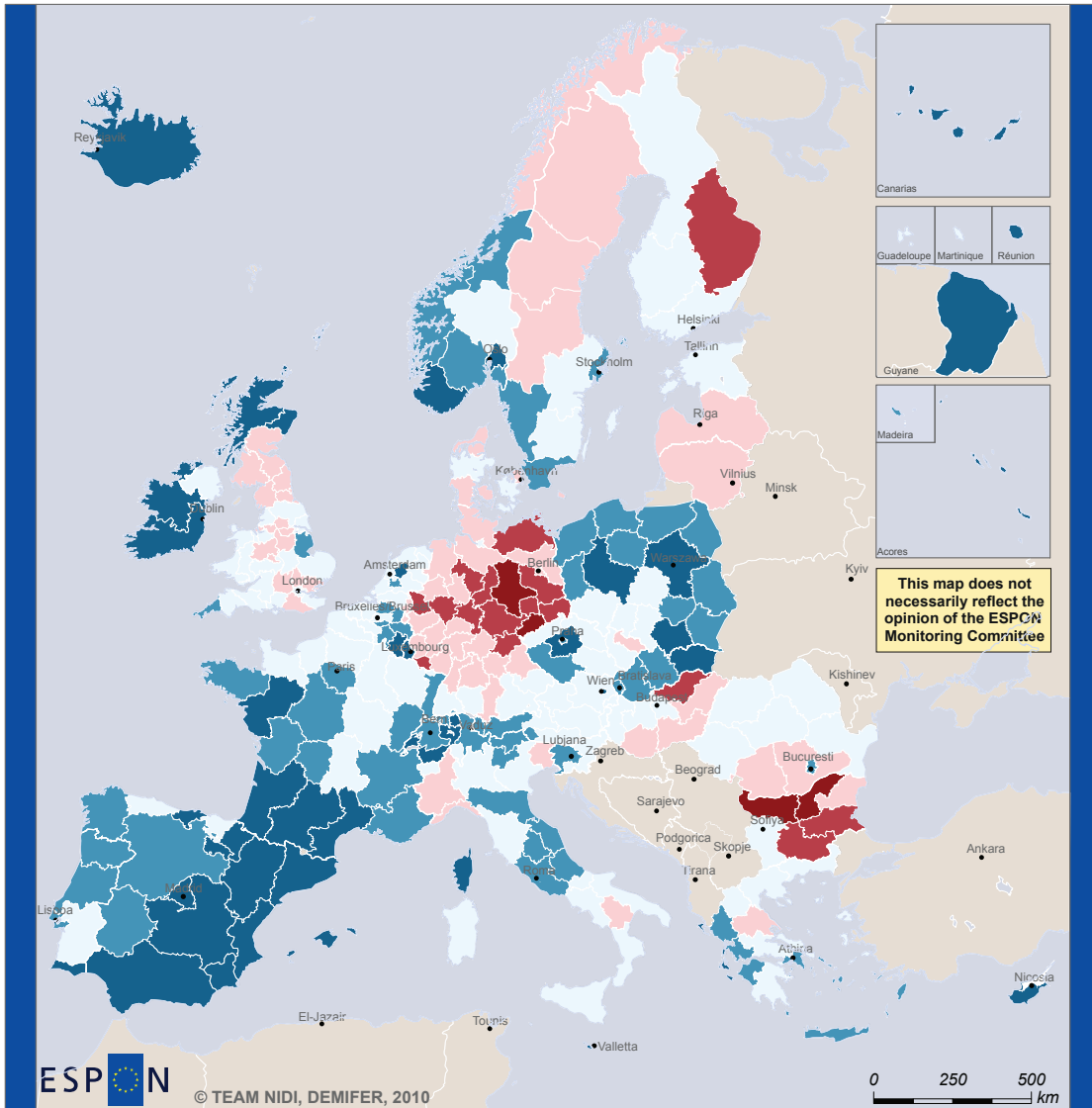
Regional level: NUTS 2  
Source: ESPON 2013 Database, 2010  
Origin of data: Eurostat, NSIs, Estimations, 2010  
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**Change in number of Persons in Labour Force  
in 2005-2050, in % after Different DEMIFER Scenarios**



These maps do not necessarily reflect the opinion of the ESPON Monitoring Committee

Map 20. Change in Working Age Population, 2000-2007

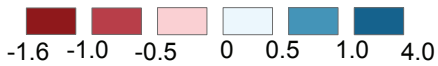


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Regional level: NUTS 2  
Source: ESPON Database 2010  
Origin of data: Eurostat, NSIs 2010  
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Annual Average Change in Population Aged 20-64 (%)



No data

In the Growing Social scenario this percentage is somewhat higher at 40%. In the Challenged Market scenario the regions with a shrinking labour force amount to more than 55% of the ESPON regions.

The Limited Social scenario sketches the most dramatic future with a large majority of the regions experiencing a setback. About 70% of the regions will see a labour force decline by more than 10%. In this scenario most regions located in the eastern part of the ESPON space and a lot of regions in the southern part will suffer a decline of the labour force of more than 30%. Also many German and Austrian regions will face such losses.

In the Expanding Market scenario many regions located in the western and northern part of the ESPON space will have a substantially growing labour force. The contrast with the eastern part is sharp, where a majority of the regions will still have a shrinking labour force. In the Growing Social scenario, the contrast between regions with a severe decline of the labour force and those with a steep growth is much smaller. This is due to the convergence assumption of this scenario, leading to more regional cohesion than under the Expanding Market scenario.

#### Further reading:

Further information on the issues addressed in this chapter can be found in the reports of the ESPON projects about territorial diversity (TEDI), demography (DEMIFER), cross-border regions (METROBORDER), energy (RE-RISK), agglomeration economies (CAEE), convergence regions (SURE), islands (EUROISLANDS), and rural areas (EDORA).

### Policy relevant key findings:

- Achieving the Europe 2020 aspiration for economic recovery involves more than a return to where Europe was before the crises. There is a need for “a more resource efficient, greener and more competitive economy”. The EU has 7.7% of the world’s population, and accounts for 16% of the world’s ecological footprint. In effect, the EU currently depends on the ecological reserves of other parts of the world.
- The effects of climate change for Europe’s regions, their people and economies range from considerable challenges to new development potentials. In particular regions with a strong focus on agriculture, forestry and winter sports tourism are highly sensitive to changes in climate.
- Extreme weather events such as floods or storms can damage infrastructure and set back development in all kinds of regions. The location of 70% of Europe’s largest cities in areas less than 10 meters above sea level underlines the importance of climate change adaptation and mitigation to Europe’s economies.
- Many regions with the biggest potentials to tap energy from wind are located in Northern Europe and some of them are perceived as peripherally located regions. Transmission to the main energy consumption area is therefore one of the connections that needs to be made.
- Scenarios for a sustainable Europe suggest that most of the initial impact is led by the metropolitan regions, especially in Western Europe, where the main investments in new technologies are expected to be made, and thereafter disseminated to second and third tier cities. Furthermore, urban areas with strong urbanization trends and less developed public transport will be more challenged than others.

Sustainable growth is seen as a key part of the Europe 2020 vision. Economic recovery requires “a more resource efficient, greener and more competitive economy”. European leadership in green technologies, backed by consumers who value resource efficiency can create new economic opportunities. By developing clean and efficient energy, Europe can reduce its imports of oil and gas and enhance its energy security. Green industries can create new jobs. Thus initiatives to tackle climate change or to make more efficient use of resources should no longer be seen only as the concern of environmentalists: rather economic recovery plans at all scales from the EU to the local need to include such measures.

The EU has set “20 / 20 / 20” targets for 2020. These are:

- A reduction in greenhouse gas emissions by at least 20% compared to 1990 levels.
- To develop renewable energy resources so that they account for 20% of our final energy consumption.
- A 20% increase in energy efficiency.

In addition, the goal of a true internal market in electricity and gas is now within reach. This will move Europe towards a low carbon economy. It will facilitate integration of renewable energy sources, and strengthen the European territorial dimension in the planning of networks.

Thus in recovering from the economic and financial crisis, Europe is also trying to shift towards a new type of economy. The idea of “Sustainable Europe” encapsulates this new direction. Territorial analysis undertaken through ESPON can assist this process of development and change. Traditionally regional policy sought to make regions richer but paid less attention to problems of congestion

and pollution that can be by-products of a rise in GDP. While GDP per capita will remain an important performance indicator nationally and regionally, measuring progress towards Sustainable Europe requires new thinking.

The well-known ‘sustainability triangle’ argues for a balance between the economic, the social and the environmental. Similarly, the idea of policy integration, which is so central to the territorial approach, implies the ambition to combine benefits in GDP growth with other claims on resources, such as those related to the environment or to social inclusion. Sustainable Europe means creating a synergy between these factors. As well as measuring the proportion of GDP invested in R&D, the five targets set in Europe 2020 call for measures of employment rates, greenhouse gas reductions, educational attainment and poverty reduction.

### 4.1 Europe’s ecological footprint

As well as looking inwards to Europe, it is necessary to look outwards and understand Europe’s position in the world. Some basic statistics show why economic recovery has to do more than return Europe to where it was before the crisis began. The EU has 7.7 % of the world’s population, and contains 9.5 % of the world’s biocapacity. Biocapacity is the capacity of ecosystems to produce useful biological materials and to absorb waste materials generated by humans, using current management schemes and extraction technologies. However, despite having above average biocapacity in relation to population, the EU still accounts for about 16 % of the world’s ecological footprint. In other words, the economic and social development in the EU countries depends on the ecological reserves of other parts of the globe. With the whole earth stretched ecologically and getting by through a strategy of eating into its resources, policy makers at all levels need to consider the ecological footprint of their territory.

The challenge is how to reduce the ecological footprint without losing the high level of economic and human development. The chapter addresses this question by looking at evidence and the scope for territorial policy to make a difference in four issues: climate change, urban sprawl, energy and conservation and clever use of landscape assets.

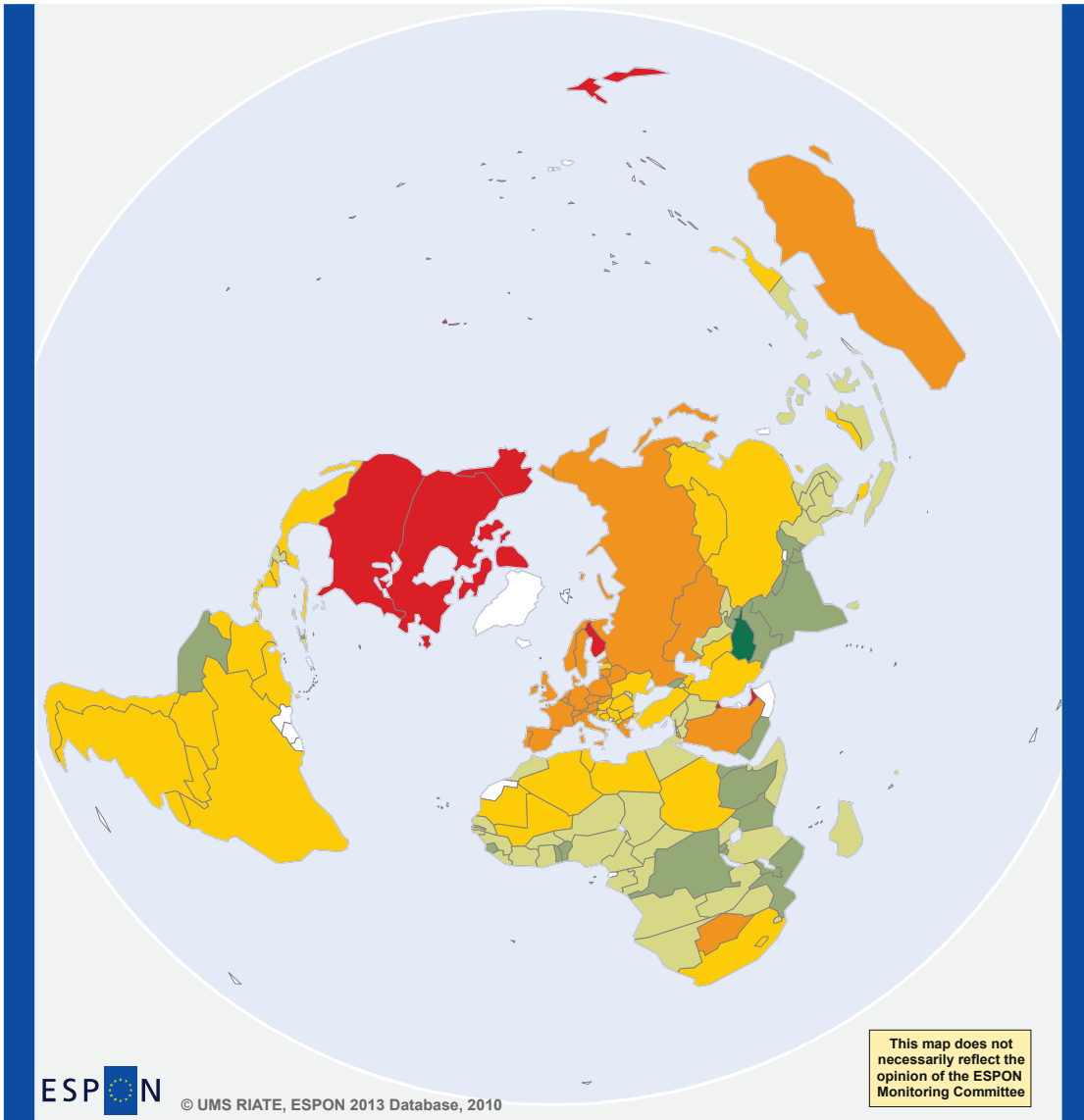
#### **Box XII. Understanding the ecological footprint and human development index**

The ecological footprint of a country is a resource accounting tool that shows a country’s ecological balance sheet, and the pressure the country puts on the planet. The Global Footprint Network publishes these accounts annually for 201 nations of the world. The measure used is global hectares per person (gha); a gha is a hectare with global average ability to produce resources and absorb wastes. Europe’s supply is about 2.2 gha per person, but its consumption is more than double that, and has more than doubled since the 1960s.

If all of the world lived like Europeans, it would need two planets to provide the necessary resources and to absorb the wastes (including CO<sub>2</sub> emissions) and to leave some space for wild species. Ecologically Europe is running a deficit and is being bailed out by the poor countries of the Global south with ecological surpluses. The good news is that in Europe some decoupling of the footprint from GDP has taken place - but the bad news is that the index of the footprint is still rising more than the index for population numbers.

The human development index (HDI) offers an alternative to GDP as a combined indicator of human well-being and provides a useful entry point into information covering different aspects of human development. The human development index of the United Nations measures the average achievements in a country on three basic dimensions of human development (a) a long and healthy life (measured by life expectancy at birth), (b) knowledge (measured by the adult literacy rate and the combined gross enrolment ratio for primary, secondary and tertiary schools), (c) a decent standard of living (measured by the logarithm of GDP per capita in ppp). The index is constructed by the United Nations using indicators currently available worldwide, and it is widely accepted as a useful international measure of human well-being.

Map 21. Ecological footprint, 2006



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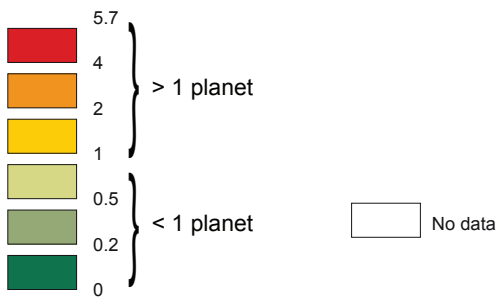
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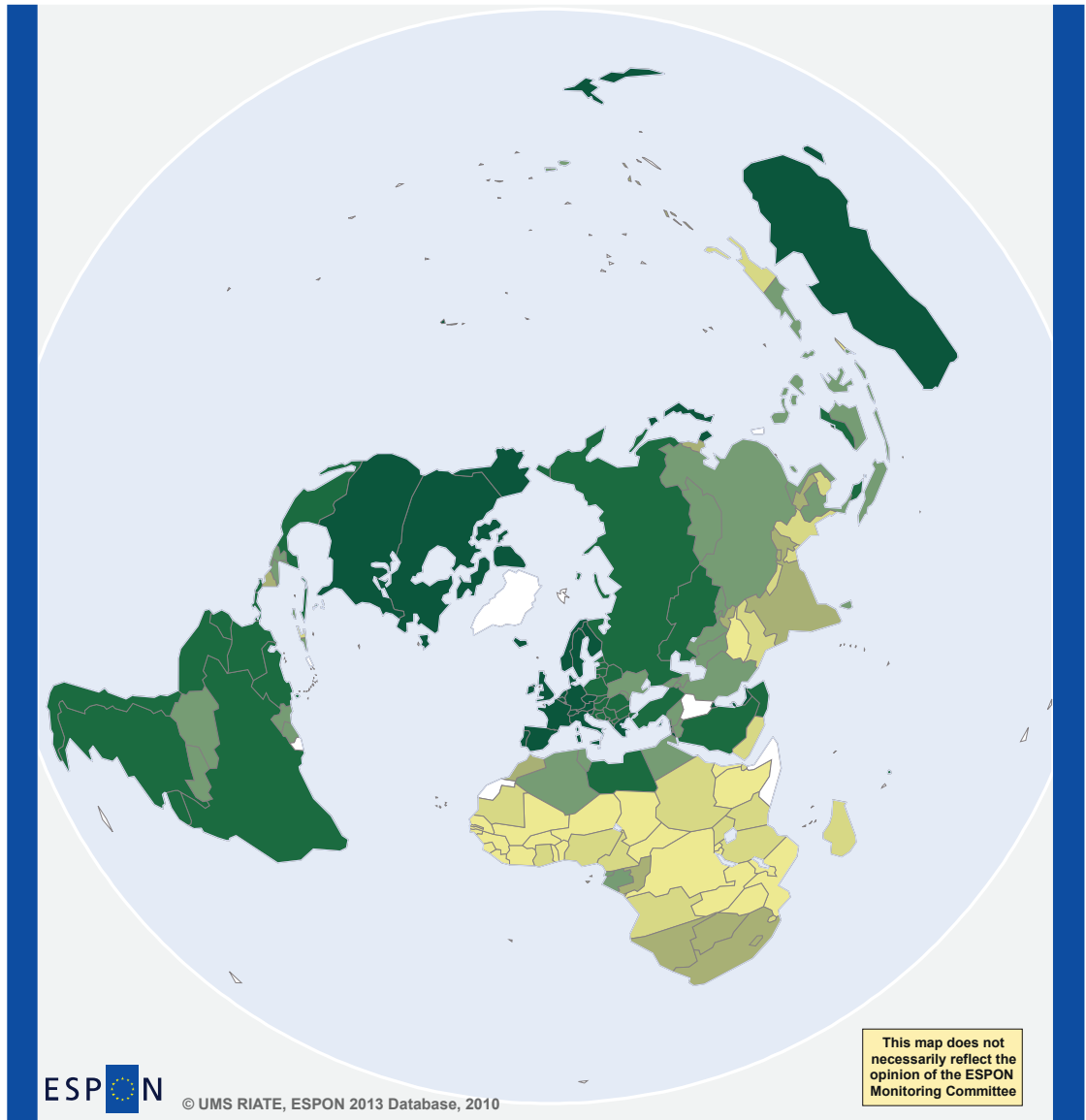
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Source: <http://geodata.grid.unep.ch>, 2010  
Origin of data: Ecological Footprint and biocapacity (2006 Edition)  
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Ecological footprint, 2006  
*Global hectares per capita*  
divided by *biocapacity (1.8 gha/hab)*



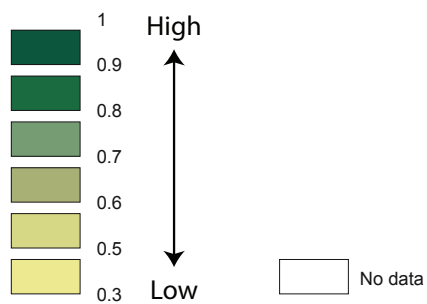
Map 22. Human Development Index, 2007




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Sources: <http://geodata.grid.unep.ch/>, 2010;  
<http://hdr.undp.org/en/statistics/>, 2010  
 Origin of data: Human development report  
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Human Development Index (HDI), 2007



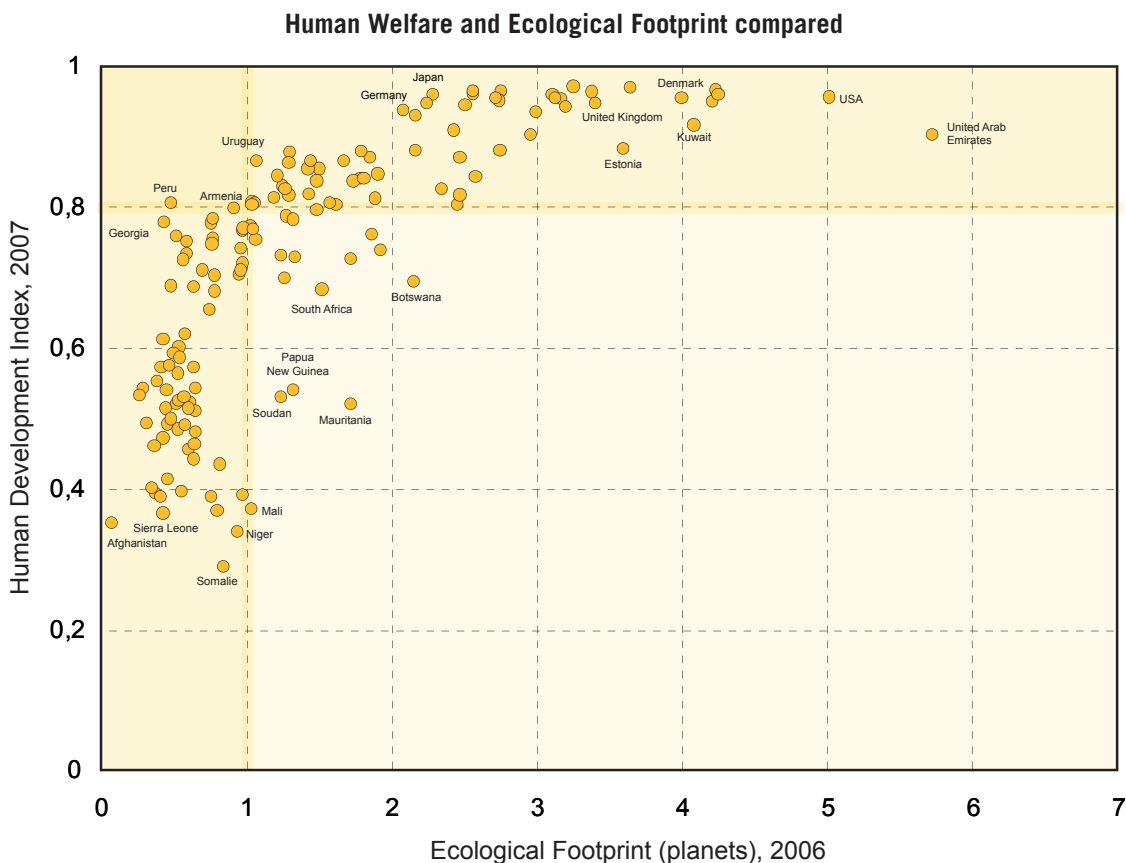


The scattergram and the maps show the global picture for countries in respect of the Human Development Index (HDI) and the country's ecological footprint.

The maps show that as the HDI increases above a certain level so does the ecological footprint. In 1995 Slovenia was the only European nation that had achieved an HDI score of over 0.8 and had an ecological footprint of less than the biocapacity available per person globally. However by 2003 its footprint had more than doubled to 3.42 gha, while its HDI had only increased from 0.86 to 0.9. Finland's footprint at 7.64 gha per person stands out on the map. However, along with Latvia and Sweden, it is one of only 3 EU countries to be an ecological creditor. This is because of its abundance of natural resources.

Germany has managed to stabilise its footprint despite increasing population. Germany has reduced the amount of coal it uses and is a world leader in renewable energy. Romania has the lowest ecological footprint of EU27. At 2.4 gha per person it is only just above the global average. The trend across Europe is that biocapacity is increasing as technology improves and creates efficiencies and as agriculture becomes more intensive. However the rate of increase is not keeping pace with the growth of consumption. Within consumption it is energy use - domestically, in transport and in businesses - that is the main driver of the rise.

It is also possible to do similar calculations for cities and regions. For example, in London the analysis was used to identify areas where high footprint reduction impacts could be made. An analysis has also been done for the ecological footprint of the Province of Milan. It found that the footprint score for the Province was 4.17 gha per inhabitant, a figure slightly above the national average for Italy which was 4.15 gha. By analysing footprints at these scales it is possible for local and regional governments to work together with local businesses to identify ways forward.



The scattergram has the 2007 HDI on the vertical axis, while the horizontal axis is the ecological footprint. Then countries are plotted by their scores on each of these two measures. The ideal is to be in the top left-hand corner, where the HDI is high, but the ecological footprint remains relatively low. The United Nations considers an HDI of over 0.8 to be “high human development.” The global average Ecological Footprint would be 1.8 global hectares per person. Thus a country with an HDI of over 0.8 and a footprint score of less than 1.8 gha per person could be seen as achieving sustainable development. None manage this.

In terms of the HDI, in the 2009 rankings Norway leads the whole world, with Iceland in third place. Other highly-placed ESPON countries are Ireland (5), Netherlands (6), Sweden (7), France (8), Switzerland (9), Luxembourg (11), Finland (12), Austria (14), Spain (15), Denmark (16), Belgium (17), Italy (18), Liechtenstein (19), UK (21), Germany (22), and Greece (25). Five more ESPON countries are with these in the group of 38 countries ranked as having a very high HDI. The remaining countries in ESPON all feature in the next band with a high HDI, the lowest ranked being Romania at 63 globally. In other words together the 31 ESPON countries account for just about half of the top ranked-countries in the world.

### 4.2 Climate change and the regional economies

Europe 2020 calls for “a vision of structural and technological changes required to move to a low carbon, resource efficient and climate resilient economy by 2050”. The transition will enable Europe to meet its emissions reductions targets. It will include new business development to sustain Europe’s leading role in green technologies in the face of international competition, but also disaster prevention and response, and adaptation measures based on more efficient use of resources. Gathering of evidence about the potential territorial effects of climate change on regions and local economies can help to identify the threats and also the opportunities.

#### Box XIII. Towards a climate change scenario

Data from a model developed by the German Weather Service (the COSMO-CLM or CCLM model) was used to model the patterns of future climate change across the European territory. This was done for periods from 2011-2040, 2041-2070 and then 2071-2100. The Intergovernmental Panel on Climate Change scenario that was used was called A1B. The A1 scenario assumes Business as Usual, with very rapid economic growth, and a global population peaking at 9 billion in 2050, but then falling back gradually, a quick spread of new and efficient technologies, and convergence between regional incomes and lifestyles, as well as extensive social and cultural interaction worldwide. The A1B scenario then assumes a balance in the use of energy resources, rather than intensive reliance on either fossil fuels or non-fossil fuels.

At world scale, rapid economic and population growth over the next decades and a balance in the use of energy resources, rather than an intensive reliance on fossil fuels, can be taken as framework conditions for a scenario consistent with the thinking about smart, sustainable and inclusive growth in Europe 2020.

Following such a scenario on climate change, and comparing averages for the periods 1961-90 and 2071-2100, the UK, Ireland, Denmark, parts of The Netherlands and northern parts of Germany experience the lowest temperature changes, but these are still up to an additional 3 degrees Celsius. Western and northern parts of France, Belgium, most parts of Germany, Poland, Czech Republic, Slovakia, Estonia, Latvia, Lithuania as well as southern parts of Sweden and Norway will be subject to temperature increases between 3 and 3.5 degrees Celsius, again comparing the 1961-90 averages with the predicted 2071-2100 averages. Southern and south-eastern Europe (except for some parts of Greece, Bulgaria and Romania) as well as Northern Scandinavia and Finland are projected to experience absolute changes of more than 3.5 degrees Celsius. Spain, parts of Portugal and parts of the Alpine space face temperature changes of more than 4 degrees Celsius according to the projections.

This warming affects the annual number of frost days that can be anticipated. The main impacts are likely to be in the northerly and eastern parts of Europe, with regional peaks of 60 less frost days on average in the period 2071-2100 compared to 1961-90. The mean number of summer days predicted shows the inverse picture. Summer remains short in the north and east, but extends still further in the south and west. Equally important is the prediction that the north of Europe will get wetter, while the south faces a drier climate. In particular, the west coast regions of Norway, UK, Ireland and the north of France face more days with heavy rainfalls. Snow cover is expected to decrease most in the Baltic States, Finland, Scandinavia and the Alpine regions.

### Sea levels

Sea level rise has become a familiar concept associated with predictions of climate change. Mean sea level has risen 10-20 centimetres in the 20th century, and the IPCC expects sea levels to rise 30-50 centimetres by 2100. However, it is important to realise that sea level rise will not necessarily flood areas, because protective infrastructure such as dikes is already in place, though such infrastructure could come under increasing stress. Nevertheless, sea level rise could involve more than just inundation of land less than a meter above sea level. Among the effects that scientists have anticipated are: various types of shoreline erosion, saltwater intrusion, more extreme storm surge flooding, rising water tables and impeded drainage, changes in wetlands, loss of some habitats, and barrier island migration. However, it remains difficult to know just what impacts sea level rise will have in specific locations and also when these impacts will come. This makes it more difficult to value the benefits of adaptation measures than it is to quantify the likely costs. This uncertainty complicates any economic assessment of the three main adaptation strategies which are:

- Protect the land from sea so that existing land uses can continue, by constructing hard structures (e.g. seawalls) as well as using soft measures (e.g. beach nourishment).
- Accommodate by continuing to occupy the land but making some adjustments (e.g. elevating buildings on piles, growing flood- or salt-tolerant crops).
- Retreat: a strategy which involves no attempt to protect the land from the sea. In an extreme case, the coastal area is abandoned.

While some adaptation measures will be taken by governments, it is likely that the majority will be actions taken by individuals and businesses. Of course exposure to the threat posed by sea level rise varies across Europe. In the Netherlands, for example, 60-70% of the country's population and economy is concentrated in areas at risk from flooding from the sea or from the rivers. In addition rising global temperatures and resulting sea level rise will affect freshwater availability and agriculture there.

### **Coastal aquifers**

Low-lying coastal areas are a common feature of Europe's geography. For example, such coastal areas can be found in Finland (Baltic Sea), the Netherlands (North Sea), England (Atlantic Ocean), Spain (Mediterranean) and Romania (Black Sea). Many of these coastal areas are densely populated and economically highly developed. Both private and corporate water consumption depend to a large degree on coastal aquifers. The aquifers are important for drinking water and irrigation water for coastal populations and economies respectively. The most important climate change variables in relation to coastal aquifers are changes of sea water levels, precipitation, temperature and evaporation. A specific risk and threat for seashore aquifers is contamination due to salt water intrusion.

### **Climatic change and Europe's cities**

While agriculture and tourism easily catch the eye in respect of climate change, it is the urban agglomerations that are really crucial. As seen in previous chapters, cities are the key engines of the global economy, they are where business and people are concentrated and so not surprisingly they contribute most to energy use and greenhouse gas emissions. The urban areas are therefore vital because of their economic vulnerability and because successful mitigation will require substantial changes in the way cities currently function.

A huge amount of Europe's fixed capital is invested in urban agglomerations. Such settlements are mainly on a coast or on the banks of great rivers that carry runoff from across a wide, often transnational water system. In Europe 70% of the largest cities have areas less than 10 meters above sea level. The urban areas in the north and west that are vulnerable to increased heavy precipitation face flood risks that could be extremely damaging in economic, social and environmental terms. Economically this could translate into serious disruption and loss of output, with additional consequences for the insurance industry at a time when financial services generally have been in crisis. The Association of British Insurers has estimated that claims for storm and flood damages in the UK doubled to over 6 billion pounds over the period 1998-2003, with the prospect of a further tripling by 2050.

Socially the cities are where most of the poor live, and the poor are least likely to be insured against or able to absorb the consequences of such climate shocks. Environmental impacts of floods include the washing of urban pollutants into water systems, reduced water quality in reservoirs, and health risks from failures of sewer networks and plants. Add in the extra vulnerability of urban areas to problems during spells of intense heat, and it is clear that there is a strong urban dimension to climate vulnerability, and a significant climate change dimension to Europe's future economic competitiveness.

One factor in urban growth is likely to be migration from rural regions, often outside Europe. According to the International Federation of the Red Cross, natural disasters are a bigger cause of population displacement than war and persecution. Rapid and unmanaged growth in urban populations can strain the availability of housing. There are important policy questions then at the urban and regional scale about how to plan for provision of affordable housing in locations where it will be in high demand.

### **Implications for regional economies**

How might exposure to these types and scales of climate change affect regional economies? Much depends on the sensitivity of the region and its ability to adapt to change. Some sectors are very directly affected by the climate. Examples would be agriculture and forestry, but also some tourism sectors such as winter sports: the skiing season is likely to shorten in Central Europe. Thus regions where these economic activities are particularly important will have high sensitivity to exposure to the climatic changes outlined above.

In contrast, manufacturing activities and most services are not so directly affected by the climate. However, extreme weather events such as floods can badly disrupt business and cause expensive damage. Infrastructure is likely to be able to withstand small variations from normal regional weather conditions: the problems will come with intense, though possibly sporadic, deviations from such conditions. Adaptation and mitigation measures in anticipation of such emergencies can therefore enhance the sustainability of regional economies, by preventing or reducing future damage and disruption. Importantly, adaptation also involves taking advantage of new economic opportunities that climatic change might present, such as scope for change of crops or farm practices.

Climate change and related habitat changes (and potential negative ecological consequences) are also important for areas with a high ecological value (based on their rare and/or untouched vegetation and fauna). Any climate changes that may result in a decreasing size or reduction of biodiversity in these areas would be of special concern.

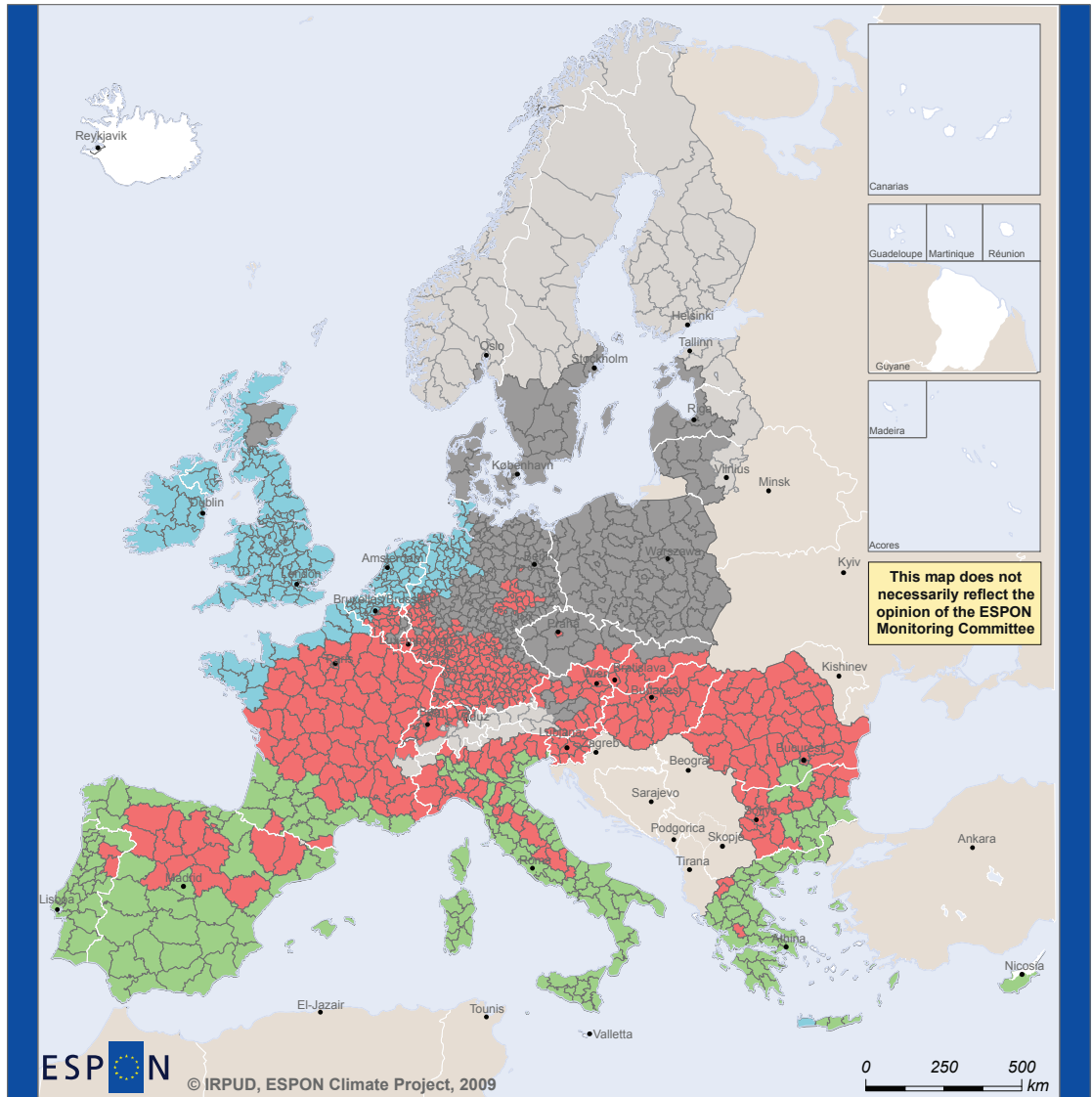
In summary, for long term sustainability of Europe's economic strength, policy makers could usefully consider:

- How agriculture might adapt to temperature changes that would create longer growing seasons in the north of Europe, but possibly pressures on water for irrigation in the south, where agriculture is still an important part of regional economies.
- How warmer seas will affect fish and consequently EU fisheries policy and related on-shore economic activities.
- The resilience of energy networks to respond to new regional peaks in demand linked to more extreme temperature ranges, through connectivity and better sharing of energy supplies.
- The ways in which the tourism industry could develop – e.g. through developing spring and autumn tourism in the hotter Mediterranean while grasping new opportunities in the warmer northern summers.

### **4.3 Urban sprawl and high energy-use commuting**

Urban transport is an important parameter in attempts to create sustainable growth in Europe. The economic importance of urban centres and metropolitan regions has been highlighted already. If Europe and its regions are to reduce their ecological footprint while continuing to enjoy a high standard of living fed by competitive businesses, ways have to be found to get people into and around urban areas in ways that are less ecologically damaging than those of today.

Map 23. Climate change in Europe, 1961-2100




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Regional level: NUTS 3  
 Source: ESPON 2013 Database, 2010  
 Origin of data: Calculations based on Lautenschlager et al., 2009  
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- Southern-central Europe
- Northern Europe
- Northern-central Europe
- Mediterranean region
- Northern-western Europe
- No data

Explanation: The analysis of European patterns of climate change has led to a typology of climate change regions derived from a cluster analysis. Based on a set of exposure indicators different types of regions according to their climate change profile have been identified.

Across South-Central Europe (red on the map) the scenario anticipates that the main changes will be: strong increases in average mean temperatures and in annual mean number of summer days; strong decrease in the annual mean number of frost days; and strong decrease in mean summer precipitation.

For regions in Northern Europe (grey on the map) the picture is: a strong increase in average mean temperature, but also in annual mean winter precipitation; overall more days with heavy rainfall, more evaporation, but a strong decrease in frost and snow cover days.

North-central Europe (black) can expect: an increase, but a moderate one, in average mean temperatures, annual mean number of summer days, annual mean precipitation in winter months and annual mean evaporation. There will be a strong decrease in frost days, less days with snow cover and a reduced amount of summer precipitation.

For the Mediterranean region (green) a strong increase in mean temperatures and the annual number of summer days is expected along with a strong decrease in precipitation in the summer months and similarly a strong decrease in frost days.

In northwestern Europe (blue) it is more days of heavy rain, more winter rain but less summer rain, higher mean annual temperatures and more summer days, but fewer frost days.

In regional terms, some examples of the implications of these changes are:

Bergen is the economic driver of a region of 360,000 people, and Norway's second city. Its climate is already cool and wet, yet precipitation levels will increase, especially in autumn and winter. The number of days with heavy rainfall could double, increasing the risk of river flooding and landslides. Sea levels on this coast could rise over 2 metres during storm surges. This poses a threat to essential infrastructure, such as transport and sewage systems, as well as to buildings, businesses and households. However, the city has already undertaken extensive adaptation and mitigation measures and plans more.

The European Alps are shared by eight countries. The Alps are characterized by mostly rural areas, but many of the 13 million inhabitants live in the densely populated river valleys. Climate change has already led to a significant retreat of glaciers and decline of snow cover. Further increases of temperatures and higher variability of precipitation will result in changes of glaciers and permafrost zones, water scarcity in summers and reduced snow reliability in winter. Occurrence of alpine hazards (e.g. avalanches, land slides) is also forecast to increase significantly. A transnational strategy is necessary to foster climate change mitigation and adaptation.

The Tisza River Basin, the largest sub-basin of the Danube, is home to approximately 14 million people. It consists of a mountainous, mainly rural upper part (the first 200 km of the river) and the lowlands (last 760 km) where there are some large cities. Droughts are a major challenge in the lowlands. According to the scenarios, precipitation will decrease and annual mean temperatures increase, exacerbating the drought problem. Dry periods will be followed by sudden, heavy rainfalls and an increase in severe river floods is expected. Such changes will have serious consequences for the urban centres and agriculture, which is still a significant sector of the regional economy.



Low density spread from the edge of the city is intimately intertwined with car-dependent patterns of commuting that in turn create greenhouse gas emissions and also high energy dependency. If energy prices escalate then cities with more compact forms that can be served by public transport are likely to be more resilient than areas of low density urban sprawl.

Cities experiencing very rapid and diffuse growth had significantly lower use of public transport than cities growing more slowly. It was also notable that cities from Eastern Europe had levels of public transport use roughly 20% higher than cities spreading at similar rates elsewhere in Europe during the period 1990-2000.

Reuse of land within the urban areas is preferable to development at low density on greenfield sites in and beyond the urban fringe. This was an important theme in the Leipzig Charter which was agreed by EU member states in 2007. For the period 2000-2006 reuse of urban land had increased in and around the core cities. However, countries which experienced early de-industrialisation, like Belgium, tend now to have a low supply of vacant urban land. On the other hand, both the supply and the challenge of re-use are greater in the eastern countries.

Greenfield sites are often more attractive to developers and carry less commercial risk. There is thus a danger that economic growth will favour loose knitted, decentralised patterns of development that will work against the EU's 20-20-20 targets and increase rather than contain the ecological footprint of territories.

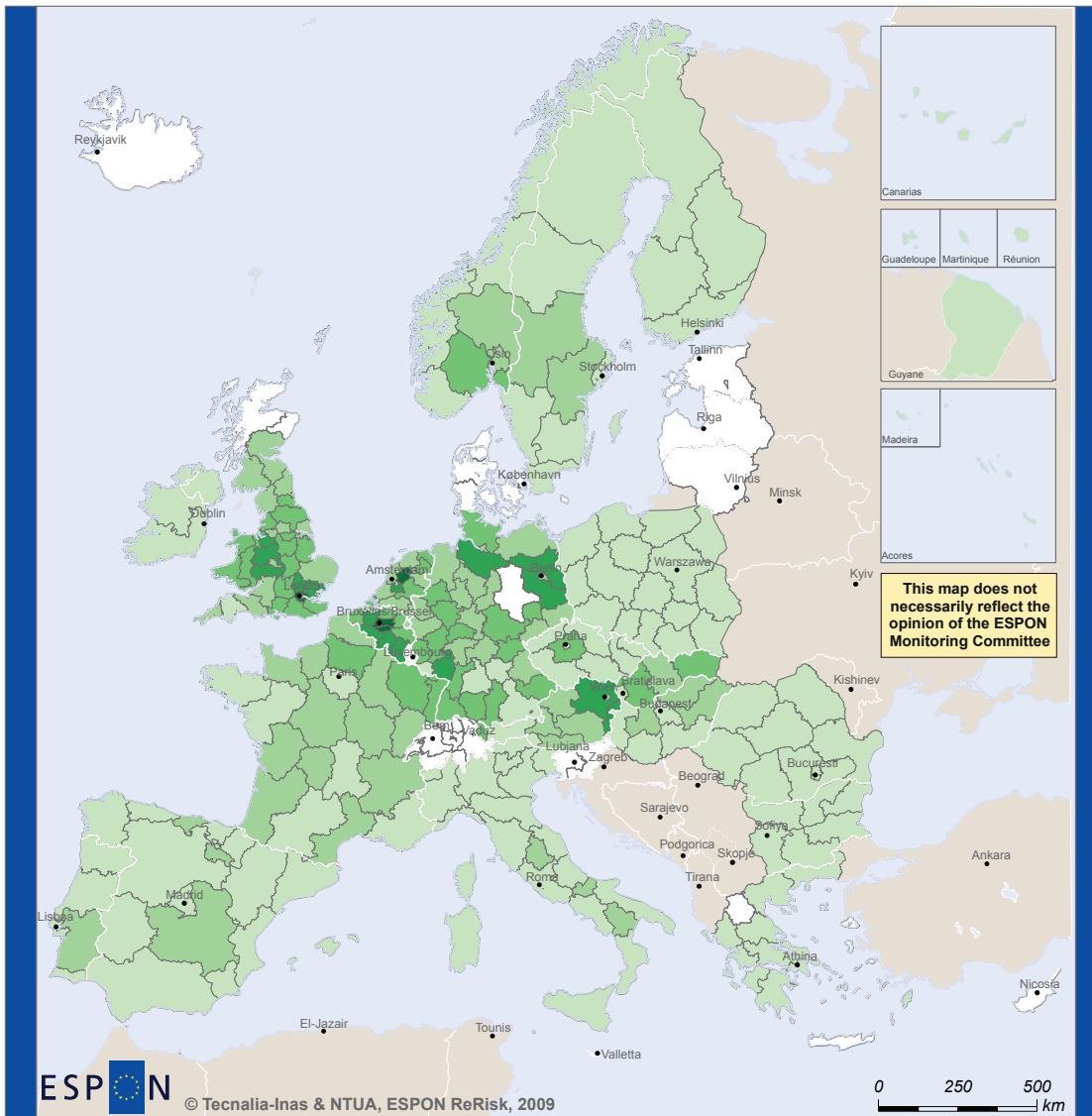
Implementation of Europe 2020 therefore should be backed by territorial strategies at national and regional levels using incentives and controls to steer development to brownfield sites. At local level a co-ordinated practice of spatial planning and economic development will need to engage with the design and development of such sites. The impact of such policies could be to divert into the urban cores some of the growth that has gone into rural regions that are accessible to such urban centres.

Commuting patterns (together with other factors such as energy intensity of industrial processes and building energy efficiency) contribute to regions' vulnerability to energy poverty. Commuting is highest in the core and around the major metropolitan regions, though commuting levels are notably less in the Eastern states. In the eastern European cities the challenge must be to at least sustain the quality and reach of the public transport systems they have. This will be difficult to achieve if patterns of growth around cities like Prague or Sofia continue in low density, loose knit forms.

Commuting is evidently one of the drivers of demographic and employment change in accessible rural regions, however it increases the risk of energy vulnerability. Industrial and commercial uses have become the main components of urban expansion. This suburban spread of trip-generating functions may mean that the distribution of land uses will make it harder to contain car-based trips in the future. Companies can contribute to reducing regional energy consumption through the better energy efficiency in their business premises, and through new arrangements of space and working times, which would also reduce the need for commuting.

Coherent, up to date territorial development strategies at regional scale need to be backed by transparent and consistent application of policies that address concerns about commuting and transport dependency. National and regional governments should be asking whether their policy and planning systems are fit for the purpose of delivering smart, sustainable and inclusive growth in the light of the ESPON findings. Deficit reduction strategies in many European countries could imply that savings are sought by cutting back on urban public transport and pushing up the prices of travel by bus, tram or train.

Map 24. Workers commuting to another NUTS 2 region, 2005



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Regional level: NUTS 2  
Source: ESPON 2013 Database, 2010  
Origin of data: Eurostat, 2010  
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**Share of workers commuting in 2005 (%)**



No data

Due to the reliability and quality of the datasets behind this map, the Lead Partner of the ReRisk Project decided not to include data collected from other sources than Eurostat

Commuting is a measure of transport dependency. The map looks at the number of workers commuting from one region to another and compares that figure with the population working in the same region. This is then expressed as a percentage. The original data was provided by Eurostat, and unfortunately does not cover all the ESPON space. However, the analysis does reveal that there are high levels of commuting in Central Europe, but levels are notably lower on the periphery. The patterns of commuting around some of the major cities stand out. London, Birmingham, Brussels, Amsterdam, Oslo, Berlin, Hamburg and Vienna are examples.

However some caution must be exercised in any comparison because much depends on the scale of the spatial statistical unit used, and in particular how tightly the boundary is drawn around the core city. Despite this limitation the map provides a basis for beginning to think about how and where a reduction in transport dependency might contribute to a Sustainable Europe, in which all regions were less vulnerable to potential impacts of rising travel costs. Modernisation of transport and energy networks is one of the actions that Europe 2020 aims to reinforce. The Association of European Border Regions has argued that this should take account of the territorial dimension. ESPON's findings confirm that this is a central issue for reducing the vulnerability of regions with a high level of commuting.

### 4.4 Landscapes, culture and biodiversity as economic assets

There is a rising market demand for leisure and tourism products that offer consumers an experience of “authentic” landscapes, cultures and habitats. Such assets are very much based on place, and therefore will be an important part of the territorial development strategies in some regions or cities. Sensitive exploitation and conservation of these assets can contribute to the Europe 2020 aim of sustainable growth.

A rich legacy of cultural landscapes and heritage buildings can be found across Europe: indeed this is a field where the idea of strength in diversity is perhaps most clearly demonstrated. However, it is also an area where the public and private sector need to work closely together to ensure that assets are not devalued by overuse of insensitive development, and that regional marketing and branding makes best use of the full range of qualities that a region has to offer.

Each landscape, artefact or habitat is unique, and recognition of that is fundamental to effective promotion and management. However, some generalised territorial issues can have been identified by ESPON. In particular, care has to be taken in rural areas that are accessible to urban centres. In these regions the supply of these environmental and cultural assets is under constant pressure from the kind of counter-urbanisation pressures and urban sprawl noted earlier in this chapter. There is also the threat from the “standardisation” associated with globalisation, which can erode the distinctiveness and variety of places. “Modernisation” of agriculture and other traditional industries can also be problematic in this respect. However, the concerns are not confined to accessible regions: the “wrong kind of tourism” can have a toxic effect on the very assets that attracted the tourists in the first place.

Skye and Locahlish in the west of Scotland is remote from any significant city, and Skye itself is an island. The area has suffered massive and long term population decline. However, since the 1960s it has managed to reverse that trend. There is still an outflow of young people, but that is now exceeded by the in-migration new residents in the 45-64 age group. The region is renowned for its cultural identity, associated mainly with the ‘crofting’ smallholdings, the collective ownership of land, and the use (and revitalisation) of the Gaelic language. This, together with the landscape beauty produces the ‘magic of Skye’ which has helped attract tourists and in-comers to the region,. Crucially, new employment opportunities have been developed around cultural heritage tourism, IT, horticulture, and alternative energy. The region's renaissance is often lauded as a success story of rural development. Confidence has been rebuilt and the cultural and natural heritage remain assets for this and future generations.

To sustain environmental and cultural assets while growing the businesses to sustain the local economy too, experts recommend “soft” and “integrated” forms of tourism development. Often in rural regions this takes the form of household pluriactivity: this means that members of a household between them are engaged in a range of different jobs or community activities. In this way living incomes can be earned and essential services sustained. However, the success of such endeavours can be helped by skills training and by strategies that build accessibility to major markets, whether by conventional transport links or through information and communications technology. Business networks able to combine strong local linkages with global reach are especially valuable vehicles for effective regional development.

### 4.5 Recovery supported by renewable energy

It is expected that, by 2030, per capita energy consumption will increase by 9%. Recognition of the limits to fossil fuel production, the contribution of depletion and CO<sub>2</sub> emissions to Europe’s ecological footprint, combined with greater awareness of energy security issues, has given impetus to policies supporting the development of renewable energies in Europe. More specifically this means developing new industries around ‘green’ energy sources such as wind power, tidal power, solar power and biomass.

Realising the potential of renewable energy should be a fundamental part of the idea of “Resource efficient Europe”, one of Europe 2020’s Flagship initiatives. Many of the areas with most potential to contribute to a “Resource efficient Europe” in terms of tapping energy from the wind are in the periphery. Examples are the north of Sweden and Finland, as well as Ireland and the Highlands and Islands of Scotland and also the Baltic States. Similarly there is considerable scope for solar energy development in southern and eastern Europe in particular.

However, having the potential to contribute energy from wind power is not the same as actually doing so. One significant problem is the variability of wind which means that wind-generated energy is best seen as part of an overall energy portfolio where connected networks can shift between sources in response to supply and demand.

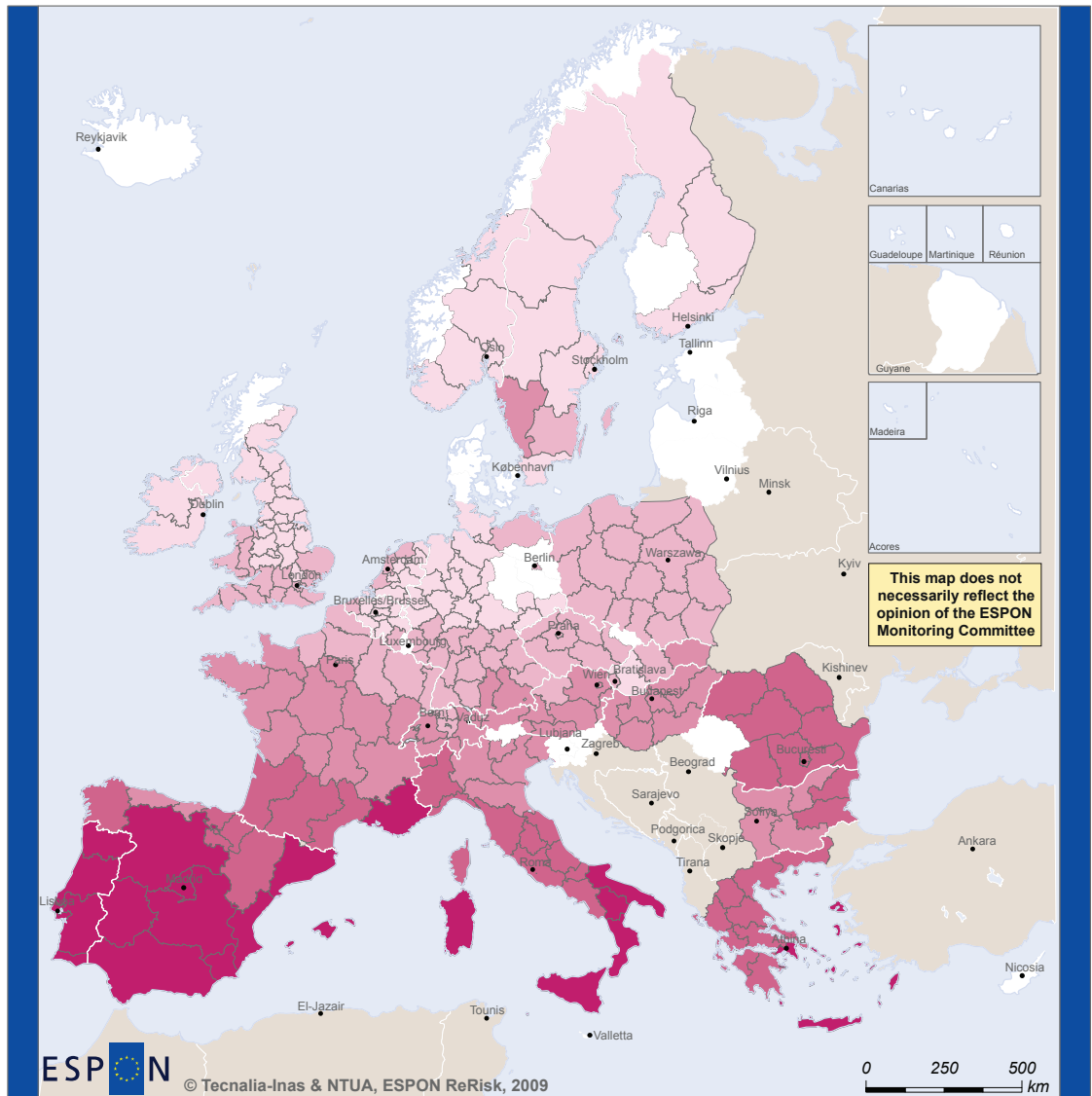
Such approaches require effective long-term strategies including regional maps of untapped energy reserves. Energy planning requires a time horizon of 30 to 60 years. The energy sector is presently undergoing a far-reaching transition process, and the political and investment decisions that are now being made will be an important element in regional competitiveness for time to come.

There are some concerns about development of biomass. Biocrops compete with other uses for scarce resources, such as land and water, in agriculture, forestry or natural sites. Specializing in certain types of plants with high energy yield could jeopardize other objectives of agricultural policy, such as that of promoting a higher level of regional sufficiency with regard to food production (by growing subsistence crops). Large-scale biomass plants could accelerate deforestation or endanger local biodiversity. These observations are not an argument against development of biomass as a new renewable energy industry. Rather they are intended to emphasise once again the need for an integrated approach to territorial development.

The map of solar energy potential shows the regional potential for electricity production from solar panels. This has been calculated and supplied by the Joint Research Centre’s Sunbird data base. The data refers to the yearly total yield of estimated solar electricity generation (for horizontal, vertical, optimally-inclined planes) [kWh]

It is similar but different to the wind map. The difference is that the regions with greatest potential are now in the south and east of Europe. The similarity is that the core is again weak, while the main potential lies on the periphery.

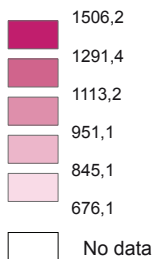
Map 25. Solar Energy Output



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Regional level: NUTS 2  
Source: ESPON 2013 Database, 2010  
Origin of data: JRC, Sunbird Database  
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**Solar energy output**



Due to the reliability and quality of the datasets behind this map, the Lead Partner of the ReRisk Project decided not to include data collected from other sources than JRC

### Scenarios – “A green high-tech Europe”?

Assumptions about the use of renewable energy sources have been built into ESPON scenarios with the underlying hypothesis that energy prices will remain at a high level and the assumption of different political responses.

A “Green High-Tech” scenario foresees an extensive growth of energy production from renewable sources which leads to a new balance between centralized and decentralized solutions.

A second scenario “Energy-efficient Europe” assumes a general decrease of total energy demand as energy efficiency is the main mitigation measure. A greater use of natural gas is inferred. Renewable have mainly served to compensate for the closure of nuclear plants.

Nuclear energy is the main priority for a centralized energy development in a third scenario (“Nuclear Energy for Big Brothers”). In this scenario large-scale renewable energy witnessed a significant expansion until the early 2020’s, but then encountered a phase of stagnation.

In the “Business as usual” scenario only a moderate transition to renewable energy sources has taken place. It is characterised by a high demand of coal and natural gas and reduction for demand of nuclear energy.

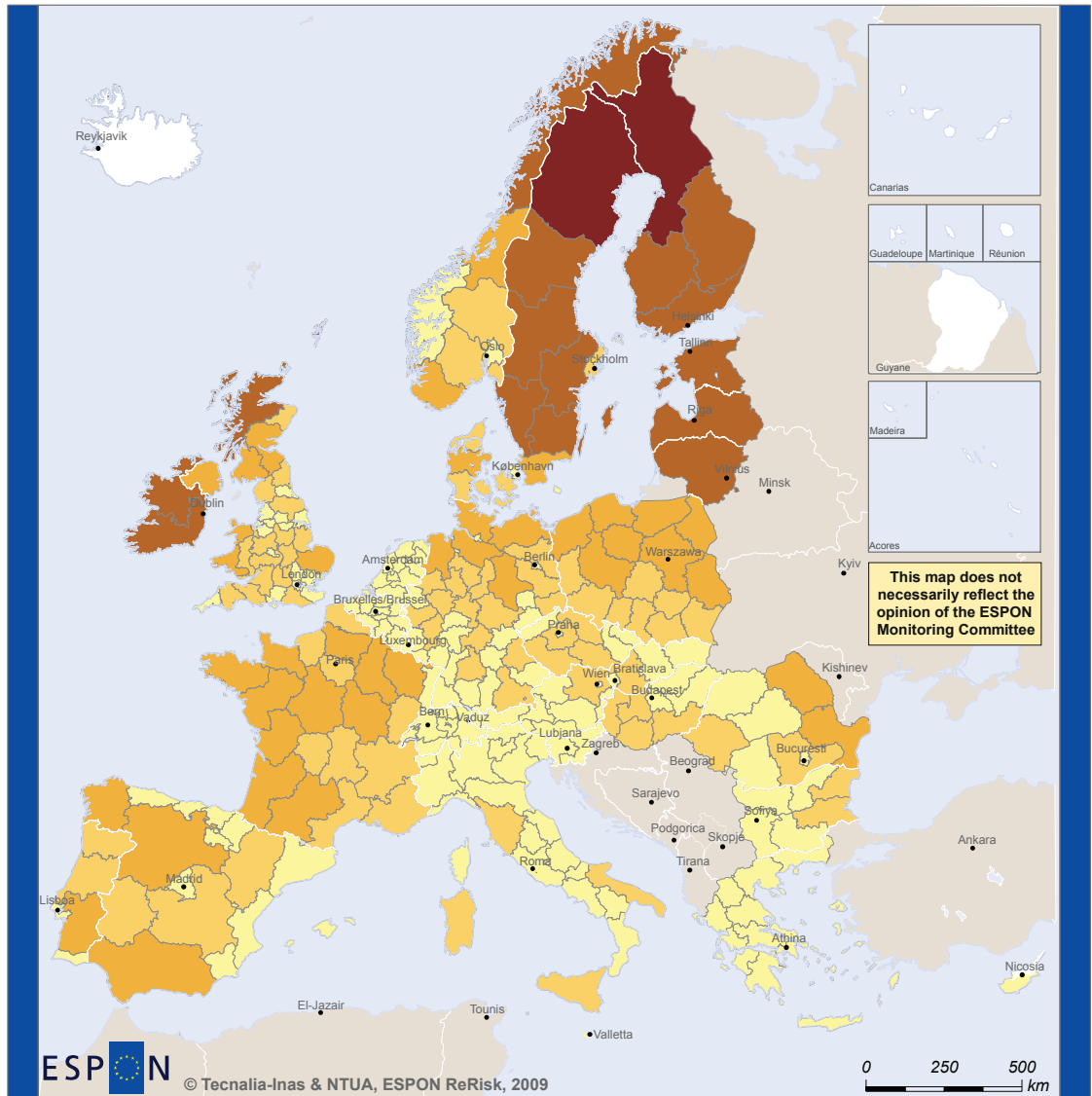
Expert assessment of the regional implications of these scenarios suggested that:

- In the first scenario new opportunities for renewable production would arise for rural regions, while urban areas would still experience social and economic growth.
- A development like in the second scenario would lead to a more polycentric growth pattern. Peri-urban areas with accessibility to natural resources would benefit particularly, while socio-economic growth would continue in urban areas.
- The agricultural areas with good access to large cities were expected to benefit under the third scenario, while remote areas were anticipated to face depopulation processes.
- In the “Business as usual” scenario urban areas would remain the only growth-poles because a rural exodus was expected to become a more general phenomenon with most negative impacts on tourist-dependent regions

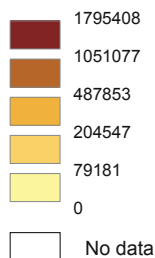
The original data on wind intensity in the regions was prepared in GIS format by the European Topic Centre on Air and Climate Change (ETC/ACC), led by PBL the Netherlands, on request of the EEA (EEA, 2009). It has been converted to NUTS 2 level by ESPON. It measures the production potential of wind power stations, taking into account environmental and other restraints. The areas with the highest potential are shown in the darkest shades. These are in Sweden, Finland, Ireland, Estonia, Latvia and Lithuania as well as the north of Norway and Scotland. However, most of these areas are very distant from major urban markets where the demand for electricity is concentrated. To fully realize the potential of the peripheral regions among others transmission costs would have to be overcome.

There could also be conflict with nature protection designations. For example, national planning guidance requires Scottish planning authorities to make positive provision for renewable energy developments. They also have to work within the Habitats Directive. The Western Isles, swept by Atlantic and Arctic gusts, are also areas with extensive designations for Special Protection Areas. Thus when a 243 turbine, 702 MW wind farm was proposed on Lewis in 2004, it encompassed three Special Protection Areas and encroached on an important area for birds’ habitats. Reduced CO<sub>2</sub> emissions, local jobs and benefits to the Scottish economy were on offer, but peatlands, birds and fisheries were under threat. As well as the various quangos and pressure groups opposing the scheme, there were almost 11,000 objections from the public. The planning application was refused by the Scottish Government in 2008 on the grounds that the development would adversely affect the integrity of a protected European site. This example shows the need to look at the territorial impact of EU Directives, and this is the focus of an ESPON project which started in 2010.

Map 26. Wind Power Potential, 2005



Wind power potential in 2005



Due to the reliability and quality of the datasets behind this map, the Lead Partner of the ReRisk Project decided not to include data collected from other sources than EEA



### 4.6 Scenarios - Imagining a sustainable Europe

The time dimension is fundamental to developing and implementing strategies for a more sustainable Europe. The ten-year timescale of Europe 2020 needs to be in the foreground, but it is also important to look further into the future. This is necessary as environmental impacts are long lasting, climate change is a long-term process and the patterns of urban areas and energy and transport networks take time to adapt while also being created by investments that require more than a decade to realise a return.

Thus while the horizon of Europe 2020 is long-term from the perspective of economic development, it is short-term from the viewpoint of sustainable development.. To help policy makers better appreciate and understand how current options and actions have long-term impacts, ESPON has developed a number of scenarios that explore how a Europe concerned with a sustainable environmental future might look. In particular there are scenarios that focus on how we respond to climate change.

One such scenario is based on the assumption that the decisions adopted at international level that aim to curb the speed of climate change are efficiently grasped as an opportunity to generate significant economic growth throughout Europe. In this scenario the increasing tertiarisation of the economy takes a distinctive path through rapid development of the “green economy”. This creates jobs both in R&D and in green manufacturing activities. The scenario looks to services moving towards higher added value segments. A more regional globalization is envisaged, and this results in higher financial services being re-centered in Europe. Through higher competitiveness and stronger public support, European enterprises are less in danger of being taken over by non-European groups or external sovereign funds.

“The Green Economy is seen as a cross-sectoral set of activities encompassing energy and transport systems, architecture and building techniques, urban planning and the greening of cities, the general use of renewable energy sources, changes in agricultural and forestry practices. It comprises activities stretching from basic research down to the implementation at large scale throughout Europe of numerous concrete applications concerning virtually all citizens. It will be accompanied by significant changes in mobility and consuming patterns, ways of life, leisure and tourist activities etc.”

The territorial impacts of the scenario change somewhat over time. The initial impact is led by the metropolitan regions, especially in Western Europe, where the main investments in new technologies are expected to be made. However in the later phase of the scenario there is diffusion of these ideas and a more polycentric pattern of growth. Indeed, some medium-sized and small cities in rural regions are seen to benefit from the creation of new sources of income through renewable energy development and “soft” tourism. There is also cooperation at the scale of macro-regions to develop renewable energy and combat the impacts of climate change. At the city scale one finds more compact urban forms and expanding public transport networks, together with the greening of cities.

It is important to recognise that such a scenario poses more challenges for some regions than for others. South and east European cities might be more challenged by sustainability issues, as they often have strong suburbanization trends; less developed modern public transport systems; more polluting cars, buses and trucks; a lower amount of green areas; less public resources for improving the environment etc. The scenario assumes that EU policies target these cities in the south and east.

Looking at the national Rural Development Programmes for 2007-2013, it seems that:

- Policies of the Mediterranean countries appear to be detailed and concrete enough to promise possible beneficial outcomes, but there is less institutional and professional ambition to tackle the issue than exists in some other parts of Europe.
- The UK, France and Netherlands have produced precise schedules and detailed programmes. Their early initiative in commencing with the integration of climate change into their programmes would ease the adaptation process.
- Northern European countries, the pioneers of using innovative technologies to tackle climate change, benefit from public concern and local authorities' provisions on the climate issue.
- The Eastern European states face a more challenged situation than others: there is less public concern and weaker institutional frameworks to carry through development.

In summary, the linking of the aim for an environmentally sustainable Europe into the economic recovery strategy is consistent with the direction that research has followed in ESPON 2013. However, to achieve the general European aims there has to be action not just at the EU level, but also across macro-regions, and at national, regional and local level too. Furthermore, the nature of the challenges posed by Europe's Green Agenda differs from one region to another, and so the solutions also have to work with regional realities and the unique opportunities that each region can offer.

### Further reading:

Further information on the issues addressed in this chapter can be mainly found in the reports of the ESPON projects on territorial impact assessment (TITAP), energy risks (RE-RISK), urban areas (FOCI), climate change (CLIMATE), and rural development (EDORA).

## 5 – Use and debate ESPON results

### Policy relevant key findings:

- Different regions have different possibilities to deliver smart, sustainable and inclusive growth and the economic recovery that Europe is looking for. ESPON findings can inform and facilitate the understanding of economic development opportunities by showing territorial potentials and challenges seen from a European perspective.
- The territorial diversity of Europe is an important asset for competitiveness, cohesion and economic recovery. ESPON evidence and facts can support policy development at European scale targeting the diversity of territorial potentials, and it can support regions and local cities to define priorities and understand their larger territorial development context.
- Successful market economies are influenced by wide differences in the geographical patterns of investment. ESPON evidence on these differences can assist both public policies and private investors to increase the efficiency of their interventions.
- Urban areas are home to main drivers of innovation and economic growth, the place of the sharpest social divides, and critical for reducing the ecological footprint.
- Policy implementation and effective delivery depend hugely on capability at regional and local level. The facilitation of governance processes can be supported by factual benchmarking of European regions and cities, targeted territorial knowledge on these areas and promotion of good practices.
- The territorial implications of public policies need to be considered with the clear aim of ensuring synergies. ESPON's experience of territorial impact assessment is a first stepping stone for such efforts.
- Europe has the potential to offer something more and better than standard economic growth strategies. Territorial scenarios can support the development of new visions for the long-term development of the European territory and a polycentric Europe.

Europe in 2010 is in a challenging situation. The financial crisis that began in the USA in 2007-2008 has significantly undermined the growth trajectory in Europe. It is still difficult to tell just how severe the impacts are in terms of territorial cohesion. There are suggestions that some regions that had a less globalised economy, with less exposure to jobs in finance and business services, may have been less badly hit. However, the recovery from the crisis is still ongoing and seems likely to lead into a new era of intense stringency in public expenditure. In those circumstances, the challenges to territorial cohesion, and to social cohesion and environmental sustainability are not becoming less important.

How might the EU best deploy its resources to achieve the smart, inclusive and sustainable growth that is desired? It is clear that there are still some fundamental differences within Europe – between the core and the periphery, between north and south and east and west, and between different types of regions. Territorial development potentials can be identified at different geographical scales: to fully exploit these potentials the independencies between different types of potentials and different geographical scales need to be acknowledged, understood and used. One debate, at all scales, and for companies as well as governments, is about where to focus effort and where to attempt to steer investment in the face of competing demands and limited resources. In other words there is a necessary place dimension to economic recovery.

ESPON findings show that different regions have different development potentials, face different challenges and have different capacities to deliver the recovery that Europe is looking for. In short,

the territorial diversity of Europe is complex but needs to be understood and translated into tailor-made policy mixes for regions, cities and larger territories.

Furthermore, territorial potentials and cohesion need to be grasped and explored across the different geographical scales, from the European to the local level. There is also an important debate to take forward about how to implement EU Cohesion policy, as well as the aims of the Territorial Agenda. While European policy is carried forward by the Commission and national governments, in the end implementation and effectiveness depend hugely on capability at regional and local level. Such capability is not yet evenly distributed across the ESPON space.

Territorial cooperation is an important potential source for enhancing competitiveness and cohesion. It can help spread know-how and share good practice. However, more important is concrete territorial cooperation arrangements with the aim of exploring comparative advantages and create a stronger development together than apart. Such concrete actions at regional and local level making use of specific development potentials are important drivers for territorial development all across Europe, and can also support balance and polycentrism at different geographical scales.

While regions, cities and national governments all have their own distinct roles to play, their cooperation is vital in today's difficult economic times. By working for common goals they can achieve synergy and efficiency. ESPON 2013 assists territorial co-operation across Europe by broadening the knowledge base and transfer of know-how in the field of territorial analysis.

### **5.1 Diversity – a strength if used effectively**

Just as city dwellers do not expect to wake up to views of the mist rising over a spectacular landscape, so those in sparsely populated areas do not expect the same type of access to the same type of public services or supermarkets as is the urban norm. The approach that diversity is a strength has underpinned thinking about territorial competitiveness and cohesion.

This can hardly be underestimated. Each place, each region is unique. It is useful to talk of east and west, core and periphery, mountainous regions, coastal regions etc. at EU level, but the reality is always more complex when viewed at a finer scale of detail. It is the diversity at this detailed level that is so important in practice. Why do some regions seem to perform better than others with similar characteristics? What are the very particular opportunities opened up by factors that are strongly place-based such as accessibility, or cultural and natural heritage?

The diversity of diversity will be the main obstacle to be overcome when attempting to transform into concrete action the aspiration of “transforming diversity into strength”. In other words, labelling regions as metropolitan, rural, islands or mountainous regions does not mean that all regions in each category can be addressed through similar measures because they from a European perspective share the same challenges and development opportunities. There is a wide range of specializations, and responses to the current crises vary widely amongst regions even those with similar geographical characteristics.

Key factors that influence progress towards balanced, harmonious and sustainable development can be identified. They appear to be the capacity to understand the wider territorial context, and to formulate and to implement locally adapted measures that target key obstacles to growth. Governance structures and administrative boundaries are important. They are often influenced by history and perceptions of areas with geographic specificities and, no less importantly, by the self-perception of their inhabitants.

At the European level, one task is to make it possible for the stakeholders of cities, rural, mountainous, insular, sparsely populated and peripheral regions etc. with very different economic and social starting points to get together, discuss policy approaches and development possibilities and challenge preconceived ideas on their possibilities. Such a facilitating role could be a main platform for territorial cohesion, and could be supported by evidence from ESPON and other sources. New European evidence about territorial diversity can be used to strengthen cooperation across borders and enhance the territorial dimension of EU and national policy and their regulatory frameworks.

### 5.2 ESPON results can support place-based governance

ESPON applied research provides an essential underpinning for translating into practice the calls that have been made for integrated and place-based approaches to economic development. Of course, ESPON is not the only source of valuable information on this topic. Europe 2020 demonstrates that place-based approaches could be implemented so as to take forward the strategy. The point about local uniqueness is made several times. Local know-how, sense of ownership and buy-in are fundamentally important to the implementation of policy made at higher levels. EU Cohesion Policy as well as the work with the Territorial Agenda put a strong emphasis on local development potentials and place based approaches.

A recurring theme in this Synthesis Report has been the need for evidence-based and effective policy-making. Regional development and cohesion has an economic dimension and a social dimension as well as an important environmental dimension. It involves a careful weighing and trade-off between what may at times be conflicting demands. While all territorial strategies and policies have boundaries in space, today it is necessary to look within wider boundaries and to appreciate the importance and strengths of other places and the connectedness to other nodes and networks.

Better integration of policy can bring added value in times of limited resources. Sector policies conceived in isolation risks to have unintended consequences, which can conflict with the aims of other policies. The territorial dimension is where such conflicts manifest themselves. Just as important is that sector policies can mutually support each other if working for a clear common objective or vision.

Integration also means vertical integration of policy. The skills are to look to scales above and below to consider what cohesion means across scales, and how action at one scale has impacts at another.

The availability of ESPON studies and the ESPON database can support this approach. They can be used to do regional analysis and comparison both extensively and in-depth. The resource created by applied research of ESPON can be used by policy makers and practitioners at all levels, as well as researchers.

In addition, ESPON works with territorial development concepts – such as polycentric development, macro-regions, development corridors, connectivity and accessibility, to name just a few. Such lenses can be used to look afresh at how a region is developing and give fresh ideas to how it should develop in the future. They also provide a link between the local / regional level and the work at EU level on EU Cohesion Policy and the Territorial Agenda.

Furthermore ESPON has led work on developing methods of territorial impact assessment. The TEQUILA model represents a significant achievement. It is a tool for providing transparency in weightings of factors in judging impacts in relation to a development decision, and it enables ex-ante predictions of impacts of policy on territorial efficiency, territorial quality and territorial identity. This and other approaches to TIA will be further developed in ESPON work during the remainder of the programme. While there is no suggestion that TIA should become another assessment requirement imposed on regional and local practitioners from a higher level of government, it can be an important supporting tool for sector policy development and in highlighting the territorial dimension in policy processes and debates.

In summary, the work of ESPON contribute with facts and evidence to territorial cohesion efforts, to place-based governance and policy making. This report has provided the latest evidence from the ESPON 2013 programme. It has touched upon important questions raised by policy makers at all levels. ESPON invites this wide range of stakeholders to carry them forward in the necessary debates of recovery and development of territories, particularly regions and cities. There are few easy answers, but there are some underlying insights about the state and trajectory of Europe, its member states, cities and regions that needs consideration. Europe has a specific potential to modernise its economic growth strategies in a “diverse” world. Evidence based scenarios such as those produced by ESPON can stimulate visionary policy development for the development of Europe.

### 5.3 Next steps in the ESPON 2013 Programme

This is the first synthesis report of the ESPON 2013 Programme. It presents initial findings from the first round of projects that were approaching completion in 2010. It is based on just six applied research projects and six targeted analysis projects. Eleven new projects have started, ten more projects are about to start in autumn 2010 and more projects are to follow until 2013. Thus the first synthesis report gives only a flavour of what will follow.

The themes studied from a territorial perspective already cover a wide range of important processes and policies with impact on territorial development. The need for better understanding of territorial structures and trends as well as the impacts of EU policies is at the core of this exercise. Based on these studies, ESPON will continue making substantial progress in respect of enriching the understanding of regions and larger territories, their imbalances and potentials. Through combining the findings of individual projects the complexity and diversity of different regions and larger territories becomes clear. Adding the territorial scenarios developed, the policy debate is further nourished.

The themes addressed in this report will be further developed and deepened over the coming years and presented in new ESPON Territorial Observations and ESPON Synthesis Reports. The ESPON website [www.espon.eu](http://www.espon.eu) always provides updated information on the latest developments and findings. The ESPON Database and all the indicators used for this report can be accessed and used for free by territories, regions and cities that want to improve their European understanding and search for new developing opportunities in that context.

# List of ESPON Projects and Acronyms

## ESPON projects used for this report

### Applied research projects:

- DEMIFER - Demographic and Migratory Flows Affecting European Regions and Cities
- EDORA - European Development Opportunities in Rural Areas
- CLIMATE - Climate Change and Territorial Effects on Regions and Local Economies in Europe
- FOCI - Future Orientation for Cities
- ReRISK - Regions at Risk of Energy Poverty
- TIPTAP - Territorial Impact Package for Transport and Agricultural Policies

### Targeted analysis projects:

- CAEE - The Case for Agglomeration Economies in Europe
- TEDI - Territorial Diversity in Europe
- EUROISLANDS - The Development of the Islands – European Islands and Cohesion Policy
- METROBORDER - Cross-Border Polycentric Metropolitan Regions
- SS-LR - Spatial Scenarios: New Tools for Local-Regional Territories
- SURE - Success for Convergence Regions' Economies

## Forthcoming ESPON reports and studies

### Applied research projects (started summer 2010):

- ATTREG - Attractiveness of European regions and cities for residents and visitors
- EU-LUPA- European patterns of land use
- TERCO - Territorial cooperation in transnational areas and across internal/external borders
- TRACC - Transport accessibility at regional/local scale and patterns in Europe
- SGPTDE - Secondary growth poles in territorial development
- GEOSPECS - European perspective on specific types of territories
- KIT - Territorial dimension of innovation and knowledge economy
- TIGER - Continental territorial structures and flows (globalisation)
- ARTS - Territorial and Regional Sensitivity of EU Directives

### Applied research projects (start autumn 2010):

- European seas in territorial development
- Indicators and Perspectives for Services of General Interest in Territorial Development

The ESPON 2013 Programme shall early 2011 launch a call for four new applied research projects.

### Targeted analysis projects (started summer 2010):

- PURR – Potential of Rural Regions
- TransMEC – Transnational Support Method for European Cooperation

### Targeted analysis projects (start autumn 2010):

- EATIA – ESPON and TIA
- ULYSSES – Using Applied Results from ESPON as a Yardstick for Cross-Border Spatial Planning and Development
- RISE – Identifying and Exchanging Best Practice in Developing Regional Integrated Strategies in Europe
- POLYCE – Metropolisation and Polycentric Development in Central Europe: Evidence Based Strategic Options
- TPM – Territorial Performance Monitoring
- BEST – METROPOLIS – Best Development Conditions in European Metropolis: Paris, Berlin, Warsaw
- SEMIGRA – Selective Migration and Unbalanced Sex Ratio in Rural Regions
- SMART-IST – Smart Institutions for Territorial Developments

### Targeted analysis projects (start probably early 2011):

- ADES – Airports and Drivers of Economic Success in Peripheral Regions
- AMCER – Advanced Monitoring and Coordination of EU R&D Policies at Regional Level



## Acronyms

CIS	Commonwealth of Independent States
EFTA	European Free Trade Association
EU	European Union
EU10	EU Member States that joined the EU in 2004
EU12	12 EU Member States that joined in the last two accession rounds
EU15	15 EU Member States prior to the last two rounds of accession
GAV	Gross Added Value
GDP	Gross Domestic Product
HDI	Human Development Index
ICT	Information and communication technologies
IPCC	Intergovernmental Panel on Climate Change
NBIC	Nano-, bio-, information technology and cognitive sciences
NUTS	Nomenclature des unités territoriales statistiques (Nomenclature of Territorial Units for Statistics)
R&D	Research and development
TEN	Trans European Networks
TIA	Territorial Impact Assessment



[www.espon.eu](http://www.espon.eu)

The ESPON 2013 Programme supports policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory. It provides comparable information, evidence, analysis, and scenarios on territorial dynamics, which reveal territorial capitals and development potentials of regions and larger territories contributing.

This Synthesis Report presents initial findings highlighting the importance of the territorial dimension for a powerful economic recovery from the present crisis and for achieving smart, sustainable and inclusive growth as outlined in the EU strategy Europe 2020.

The purpose of this report is to communicate important findings of the ESPON 2013 Programme, and to nourish policy development for different territories in Europe through a dialogue among policy makers, practitioners and researchers. As part of this dialogue you are welcome to engage with ESPON via [www.espon.eu](http://www.espon.eu).

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