ESPON

ESPON ATLAS

Mapping European Territorial Structures and Dynamics

November 2014

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Colophon

This ESPON Atlas results of a "Scientific Platform and Tools" Project conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU28, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

Information on the ESPON Programme and projects can be found on www.espon.eu

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

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

This publication was produced in cooperation of

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ESPON Atlas 2013

Mapping European Territorial Structures and Dynamics

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Digital ESPON Atlas

An interactive digital version of the ESPON Atlas 2013 is availalble at www.espon.eu.

The digital version was developed by Bruno Brödner, Björn Schwarze and Klaus Spiekermann supported by Lina Kluge, Rico Stichmann and Tim Thomé, all with Spiekermann & Wegener, Urban and Regional Ressearch (S&W)

I. Foreword

The ESPON 2013 Programme continued pursuing the achievements attained by ESPON in supporting policy development with evidence in relation to territorial cohesion and the aim of a harmonious and balanced development of the European territory. Over the past seven years, an extended network of European researchers and experts continuously provided new and substantial evidence on Europe's territorial structures, trends, perspectives and policy impacts.

This new knowledge has been provided to enable policy makers and practitioners at all administrative levels to benchmark and position regions, cities and larger territories in their European context, and to include a territorial dimension and a European perspective in their policy considerations.

The ESPON Atlas "Mapping European Territorial Structures and Dynamics" gives a comprehensive overview of the multitude of themes that have been addressed by all applied research projects and targeted analyses of the ESPON 2013 Programme. It offers an overview of the state, trends and perspectives for the European territory. The Atlas also allows for comparisons with other European regions and cities, and it supports the understanding of Europe's territorial diversity of potentials and challenges.

The Atlas can therefore be particularly used by policy makers at European, national as well as regional/local level, to understand and define the most efficient investments for individual regions, cities and/or larger territories and to pursue tailor-made, place-based policies. At the same time it can also be used by the private sector, students and the general public.

The ESPON Atlas is based on research and analyses undertaken during the economic crisis which started in 2008. As European data updates become available with some delay, some of the evidence presented in this Atlas had to include pre-crisis data. However, efforts have been made wherever possible to include the most recent data to be able to reflect appropriately the effects of the economic crisis on Europe's regions and cities.

Generally, the Atlas covers the territory of all countries participating in the ESPON 2013 Programme, i.e. all EU Member States plus Iceland, Liechtenstein, Norway and Switzerland. Croatia as the newest EU Member State is however not always covered.

As such, the ESPON Atlas offers an overview of European territorial dynamics. A web-based version of the Atlas will become available by the end of 2014 and will allow policy makers, the private sector, students and the general public to use the Atlas as an interactive source of information.

We hope you will enjoy the ESPON Atlas and if you would like to find out more about specific research topics, analyses and tools, please go to the website www.espon.eu.

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II. Urban and rural areas

Territorial division into urban and rural areas is one of the most significant spatial delineations representing a characteristic of living conditions, economic activities and culture. The European Commission policies focus on specific territories. Some policies can be easily identified by the type of territory they refer to and some policies only apply to one type of area, for example urban or rural areas.

Also, there are differences not just between these categories of territories but also between different EU countries. Urban areas are determined by the size of cities. They exist as urban regions and agglomerations, but also as functional urban areas metropolitan regions, cities and towns. The same also applies to rural areas, which could range from peri-urban with a smooth transition of urban and rural characteristics to peripheral rural regions.

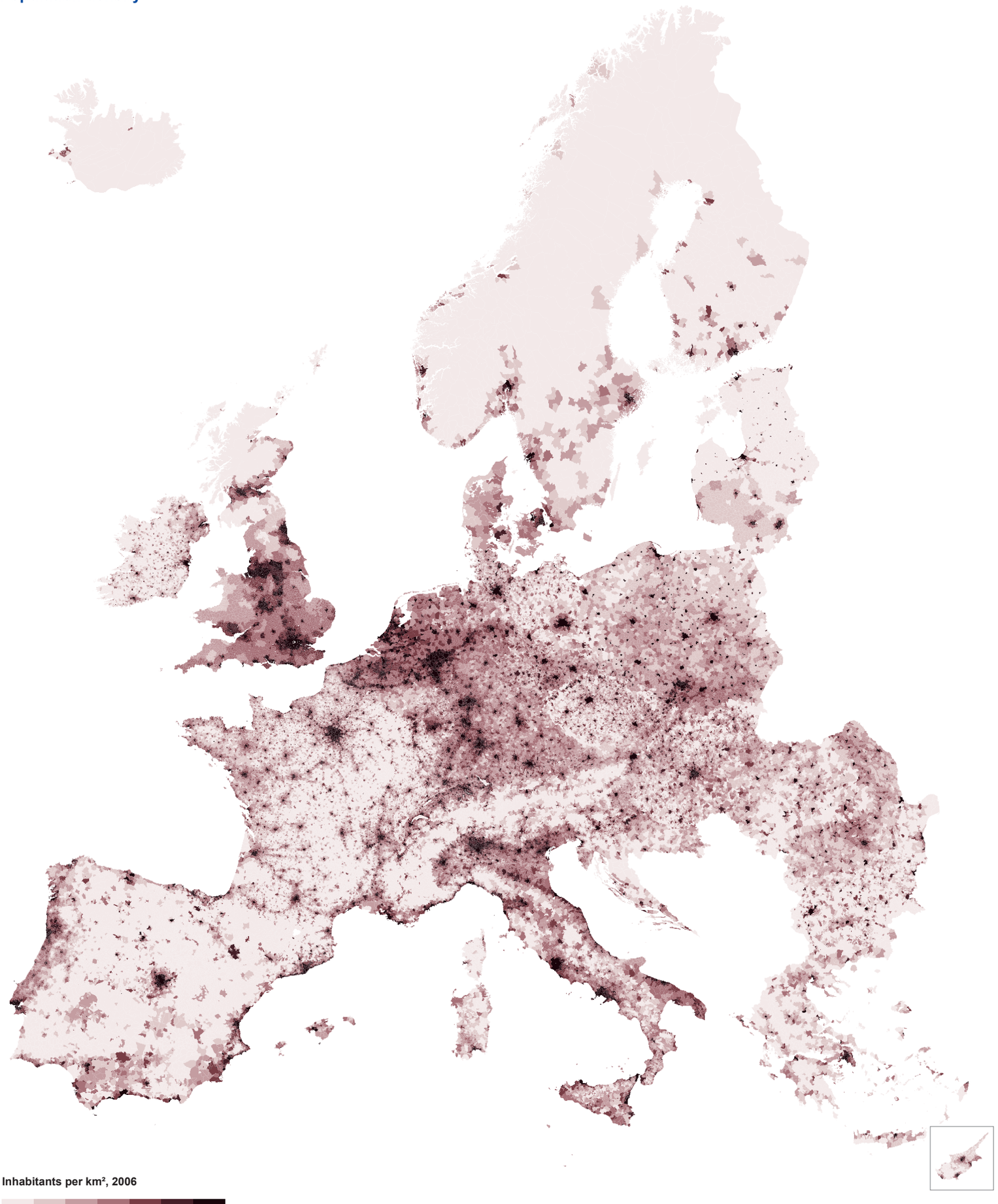
In European territorial development policy, in order to achieve territorial cohesion there needs to be a polycentric and balanced territorial development, as laid down in the European Treaty.

The Territorial Agenda of the European Union 2020 (TA2020) recognises metropolitan and urban regions as important assets for development. They contribute to the development of the European territory and play crucial roles at different regional levels. They add value and act as hubs which contribute to the development of wider areas or regions. The development of a wide range of rural areas should take into account their unique characteristics.

The shift towards an integrated approach of urban and territorial development policy in the TA2020 strengthens the urban dimension by emphasising the importance of the interaction of policies at various levels (e.g. EU policies, national policies, regional policies, local policies). Furthermore, cities should improve their performance in European and global competition and promote economic prosperity. The EU2020 Strategy has a territorial dimension to support this objective.

However, there is a need for greater awareness of the specific potentials and assets of the different dimensions of the territory right across the EU. For the EU2020 Strategy to be successfully implemented, functional regions, cities and rural areas need to be identified and specific actions need to be outlined.

Population density



Inhabitants per km², 2006

25 50 100 250 500 1000

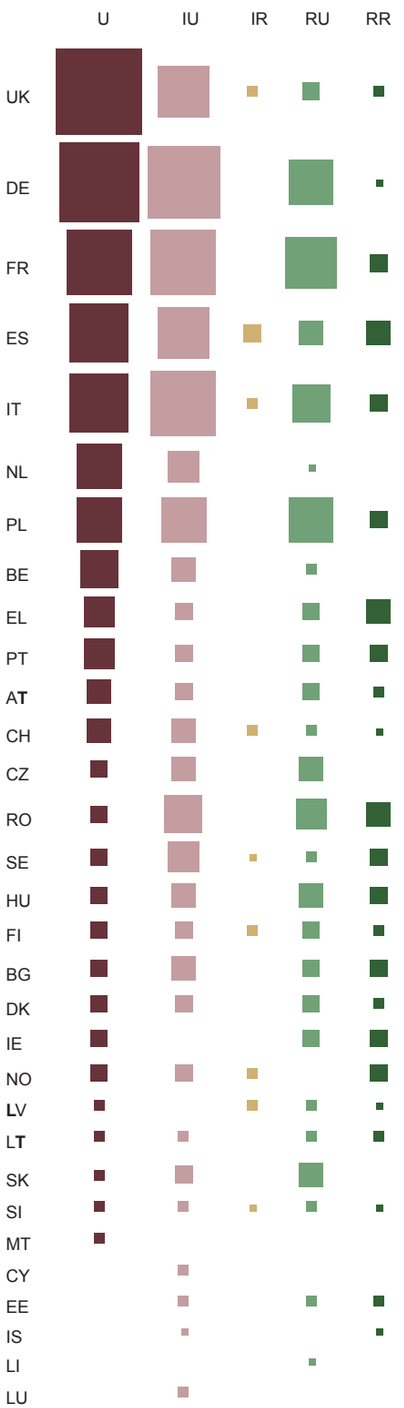
Regional level: LAU 2
Source: ESPON GEOSPECS, 2012

Urban and rural Europe

211 **million people**

live in urban regions. This is equivalent to the population of France, Spain, Poland and the United Kingdom.

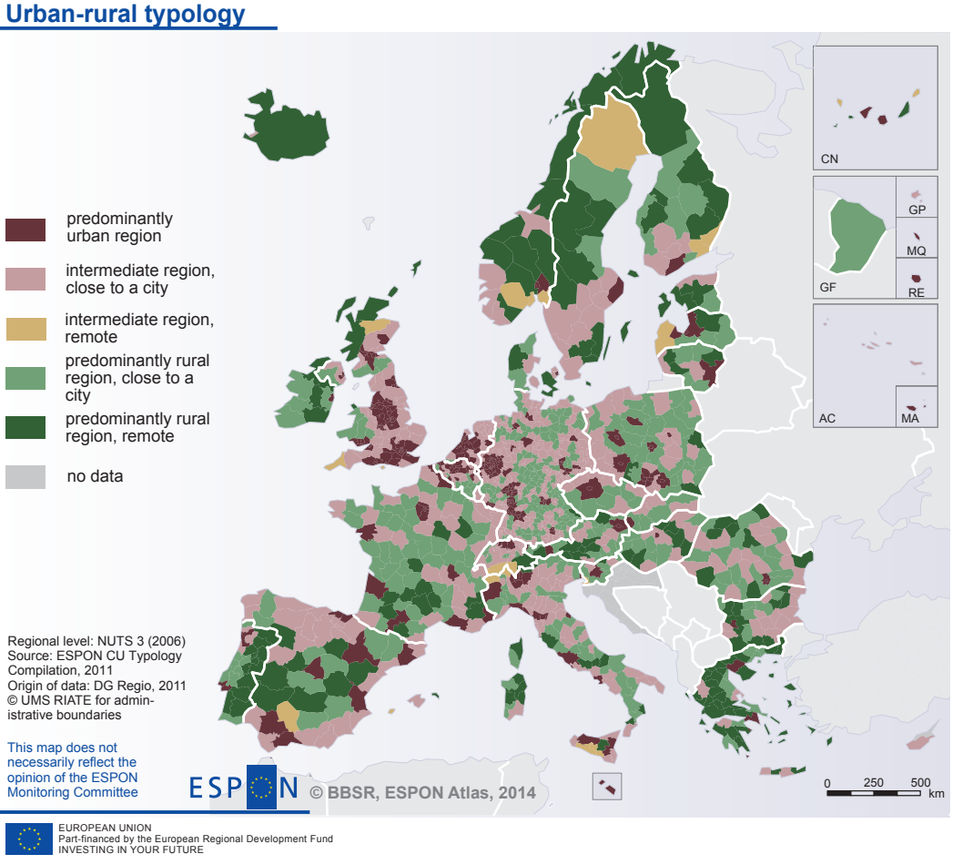
Population by different settlement types, 2011



U predominantly urban region
IU intermediate region, close to a city
IR intermediate region, remote
RU predominantly rural region, close to a city
RR predominantly rural region, remote

based on ESPON CU Typology Compilation, 2011

Urban-rural typology



Urban and rural regions maintain and safeguard the development of the European territory. Their mutual interdependence guarantees their balanced progress which reinforces the joint progress in regional growth.

Defining what is urban and what is rural in a European context is not an easy task. This is due to national specificities, which means that in some countries for example, rural areas may be of urban character. A European approach which takes into account population density and the size of municipalities argues for a comparable interpretation of urban and rural areas by distinguishing between predominantly urban and predominantly rural areas. This approach takes into account the aspects of vicinity and remoteness.

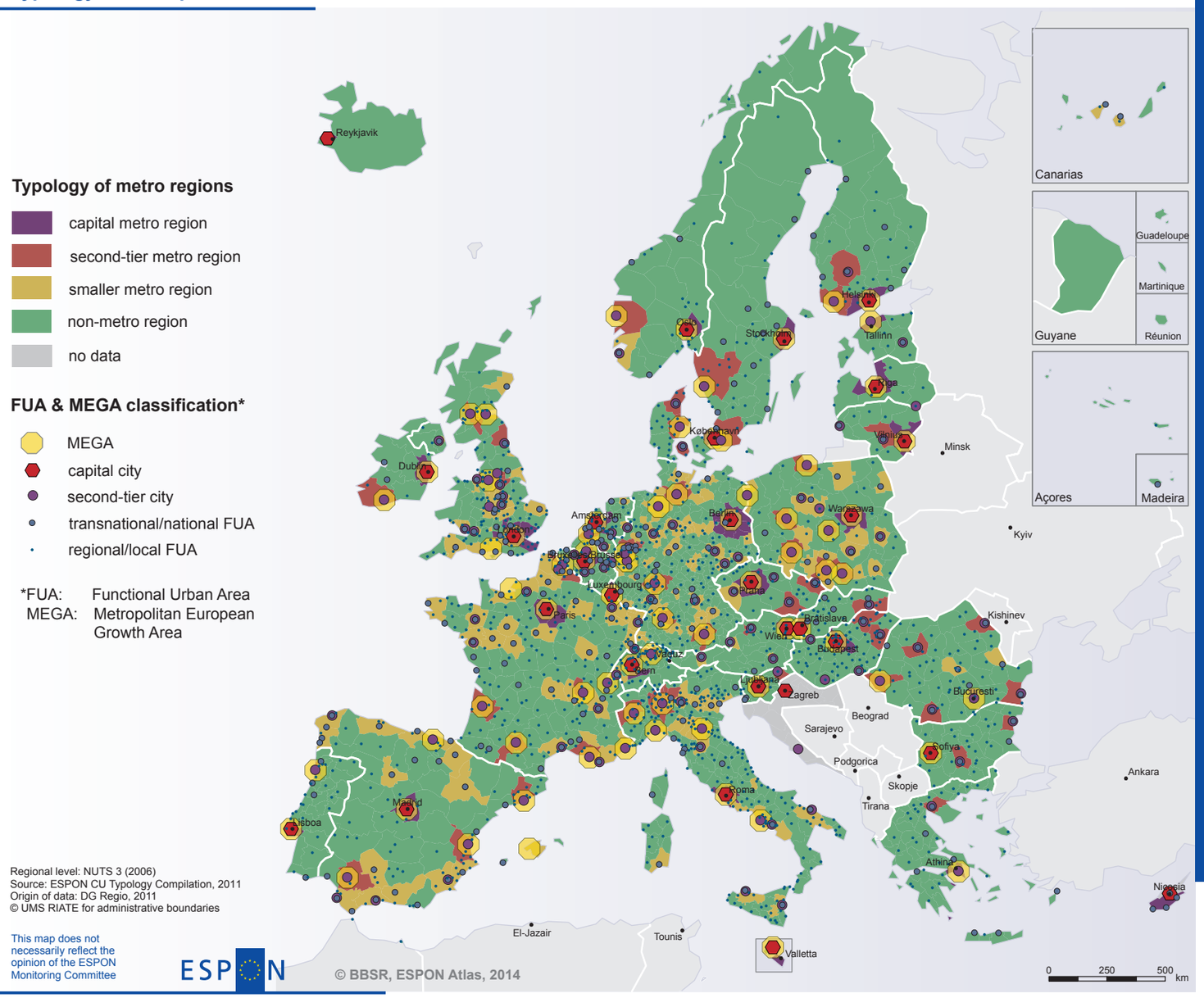
Of the 32 countries participating in ESPON, 40% of the population lives in municipalities, in predominantly urban regions, 35% live in the intermediate regions close to a city and 18% live in predominantly rural regions. There are significant national variations between urban and rural occupancy; for example, in the Netherlands 71% of the population lives in urban regions compared to only 10% in Romania. In Norway 36% of inhabitants live in predominantly rural regions, compared to only 1% in the UK. In other countries such as Belgium, this regional category does not exist.

Cities and metropolitan regions are crystallisation points in territorial development. They provide central services at different regional levels and concentrate functions in economic, social and cultural fields at a global, European, transnational, national and regional level. The functional diversity of metropolitan regions, for example capital regions and so-called second tier cities makes an important contribution to national economies by ensuring a stable development.

60% of the EU population lives in metropolitan regions, 28% of which live in the capital regions. From a European perspective, over the last twenty years the capital city regions have had the fastest growing population. In comparison, the number of inhabitants outside of metropolitan regions has increased at a lower rate. With regard to the second tier metropolitan regions, these have showed the lowest growth rates. As development trends vary from country to country, it seems that capital cities influence development unevenly. In Poland for example, growth in population concentrated in the capital region only. In contrast, in the UK apart from the capital, the smaller metro regions also gained in population. In Germany, the capital and second tier metro regions were the main areas of urban population growth.

Strong capitals matter to nation states seeking to position themselves in Europe and in the world. Strong second tier cities and metropolitan regions also matter but they show differences in functionality and size. Smaller metropolitan areas and functional urban areas in the intermediate regions but also in predominantly rural areas have less functionalities mainly of transnational/national importance. In the rural areas and espcially in remote araes and islands, small und medium sized towns are of fundamental importance for the territorial stability by providing crucial central services.

Typology of metropolitan areas



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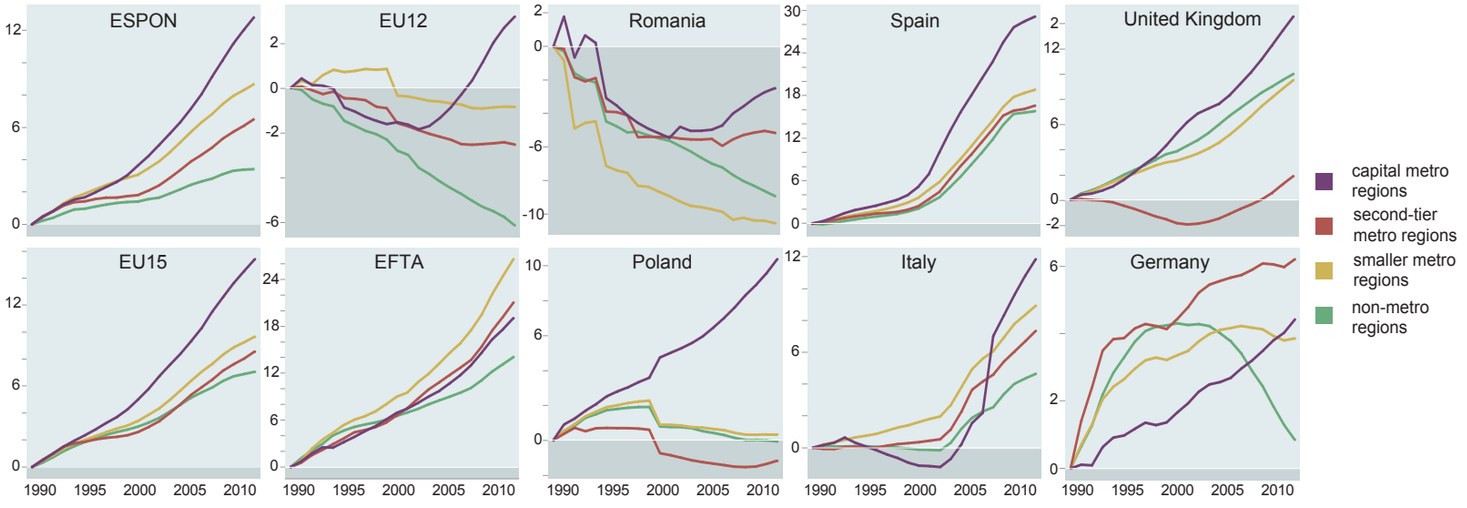
Population development by metropolitan types and selected countries, 1990–2011 (difference in % to 1990)



Source: based on ESPON CU Typology Compilation 2011

European network of cities

The

10

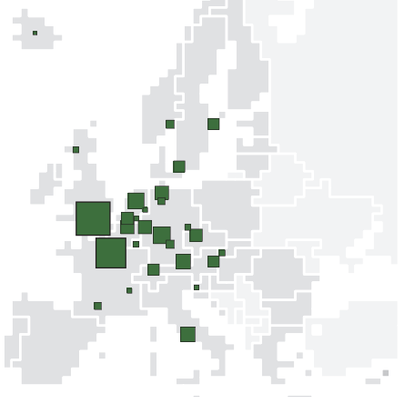
strongest economic metropolitan regions concentrate

20 %

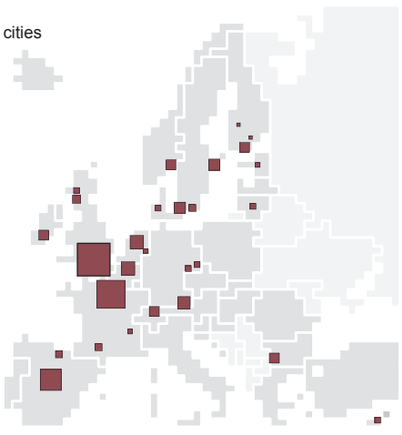
of the GDP of the ESPON countries.

TOP 30 European cities in different economic fields

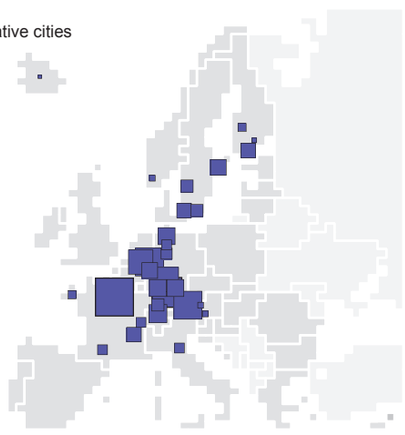
Leading sector cities



Skilled cities

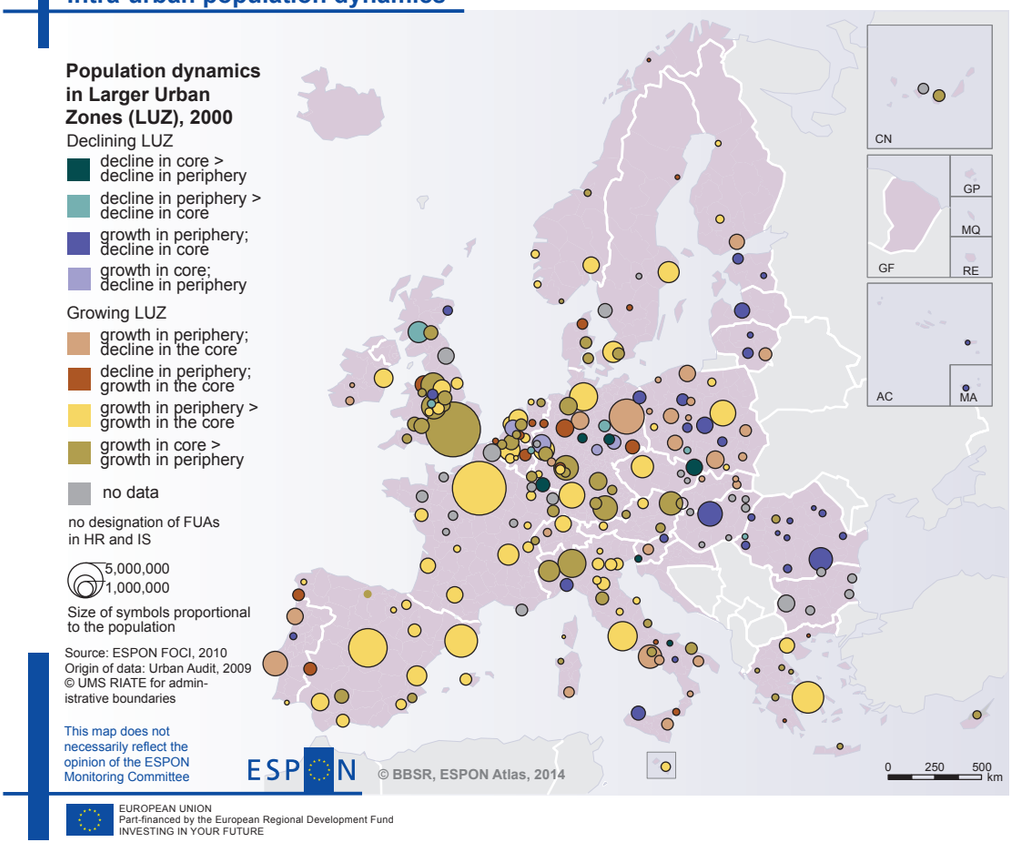


Innovative cities



Size of symbols proportional to number of
Leading sectors cities – persons employed in financial and real estate sector 2008
Skilled cities – persons employed with tertiary education 2008
Innovative cities – patent applications 2006
Source:ESPON SGPTD, 2012

Intra-urban population dynamics



As EU policy is focusing on making the European economy more competitive in the world, the interest in cities is growing and the idea of cities as “growth poles” re-emerges in the debate about policies in support of competitiveness.

In the discussion about the contributions of different territories to the EU2020 Strategy, the debate about the economic contribution of cities is gaining speed. One aspect related to this deals with the concentration of investments. It shows that a greater distribution of investments in countries is associated with stronger economic performances by their second tier cities. The smaller their gap to the capital, the more successful the national economies will be and the better second tier cities. will perform.

From a demographic and economic perspective cities in Europe are changing. The evolution of cities is dependent on the relationship between the urban core and its hinterland. Furthermore, the stage of the urbanisation process is in general linked to overall economic development at both regional and national level.

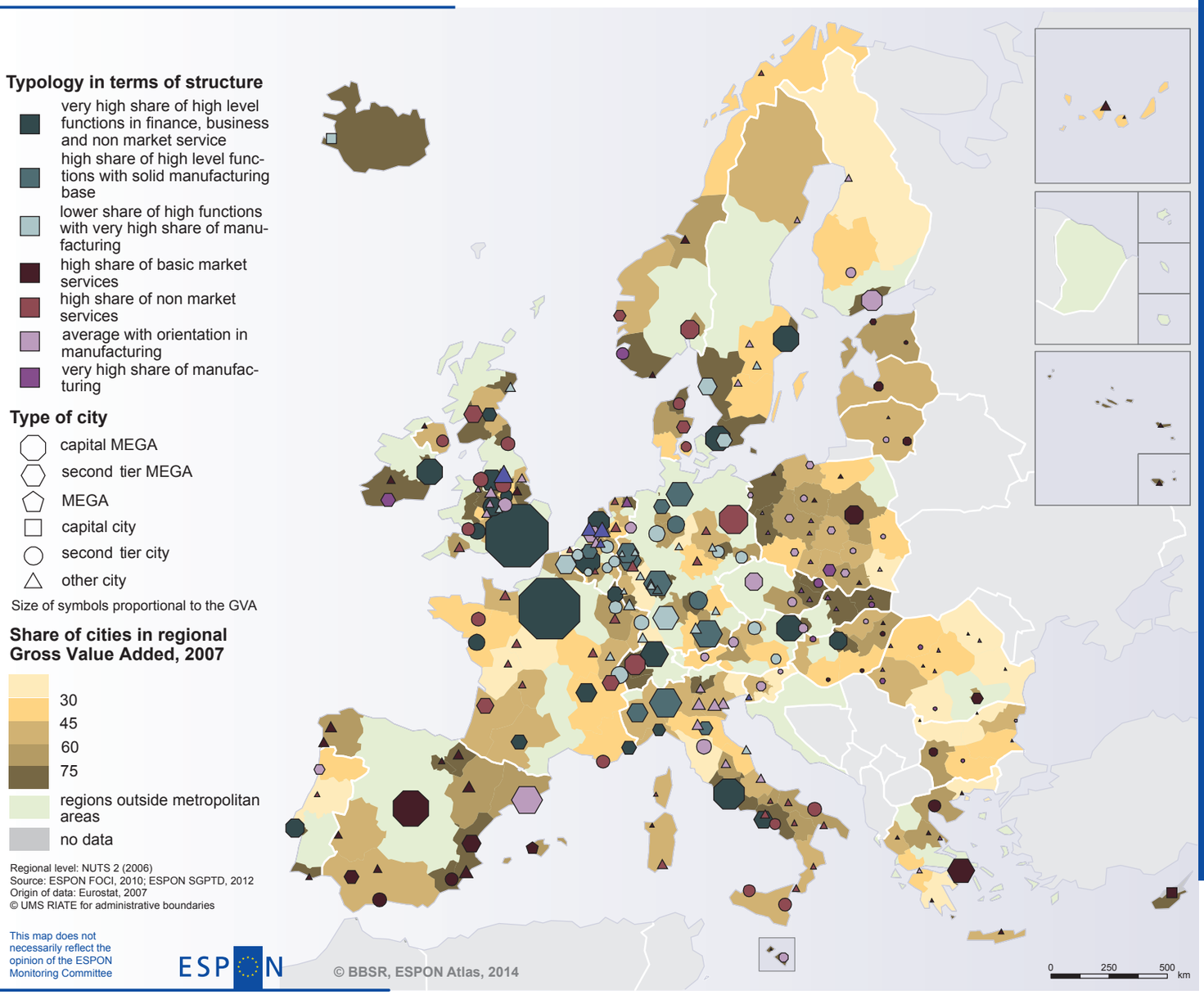
European cities are characterised by different types of development trends such as suburbanisation, counter-urbanisation and re-urbanisation. In central parts of Europe where urban population density is high, many cities are characterised by population growth in both core and peripheries. In these cities, the population growth was often faster in the core compared to the periphery. In Eastern Europe, most cities experience a decline of their population combined with an intense process of suburbanisation. In Mediterranean cities population growth was mainly due to an intense process of suburbanisation. Southern and Eastern Europe are characterised by increased suburbanisation trends, while re-urbanisation is more prominent in the cities of the ‘centre-north power house’.

Currently, the sectoral structure of Europe‘s cities can be seen as a factor of competitiveness, but it is also an indication of the historical paths these cities have taken. Territorial development is built on an interwoven capitalisation of sectoral strengths based on innovation, economic diversity, skills and human capital, connectivity, place quality and governance capacity. Cities are concentration points of these activities.

The sectoral diversity ranges from big metropolises concentrating high-level functions in finance and business services, to cities reliant on a solid manufacturing base. The highest concentration of finance and business services is found in the four major financial cities: London, Paris, Amsterdam and Frankfurt. There is an obvious concentration of economic activities in the big cities. In the UK, London stands for more than one third of the total national GDP, whilst other major cities play only minor roles. The more polycentric the national city system, the more importance secondary cities and towns gain from their contribution to the national GDP (e.g. Poland, Italy and Germany).

Metropolitan areas and cities contribute decisively to the regional and national development. This happens at different regional scales in different regional functional importances. The interaction in the range between capital cities and small towns is the base of a balanced network of strong cities.

Economic structure and importance of cities



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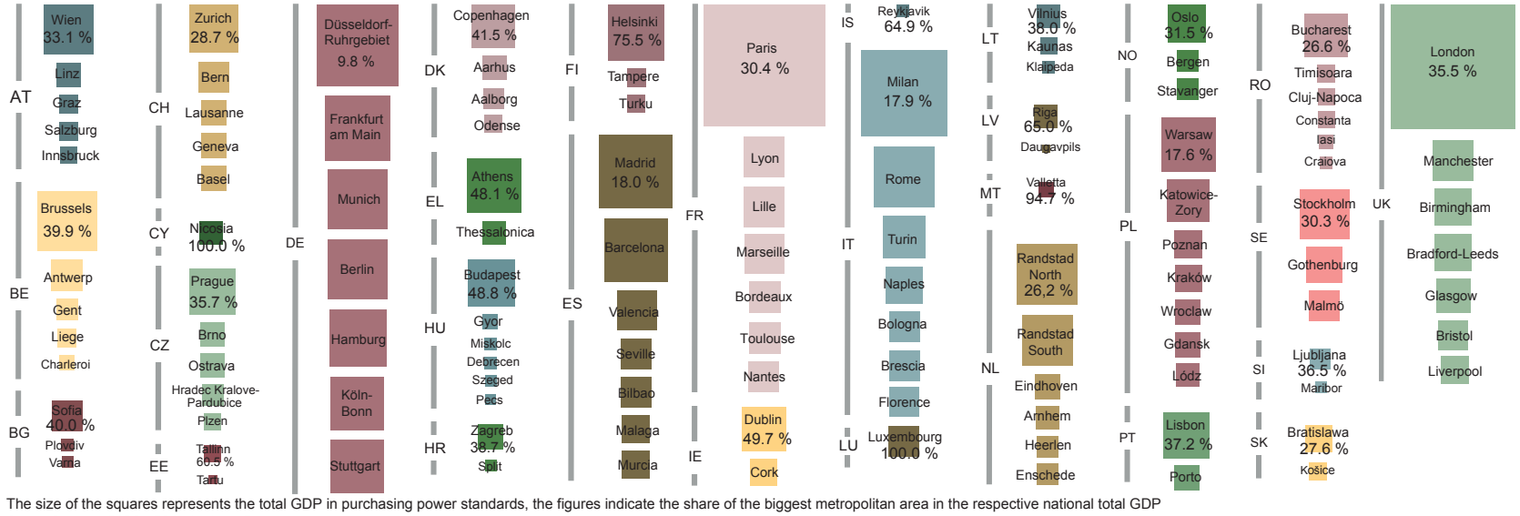
Gross Domestic Product of selected metropolitan areas, 2011



The size of the squares represents the total GDP in purchasing power standards, the figures indicate the share of the biggest metropolitan area in the respective national total GDP

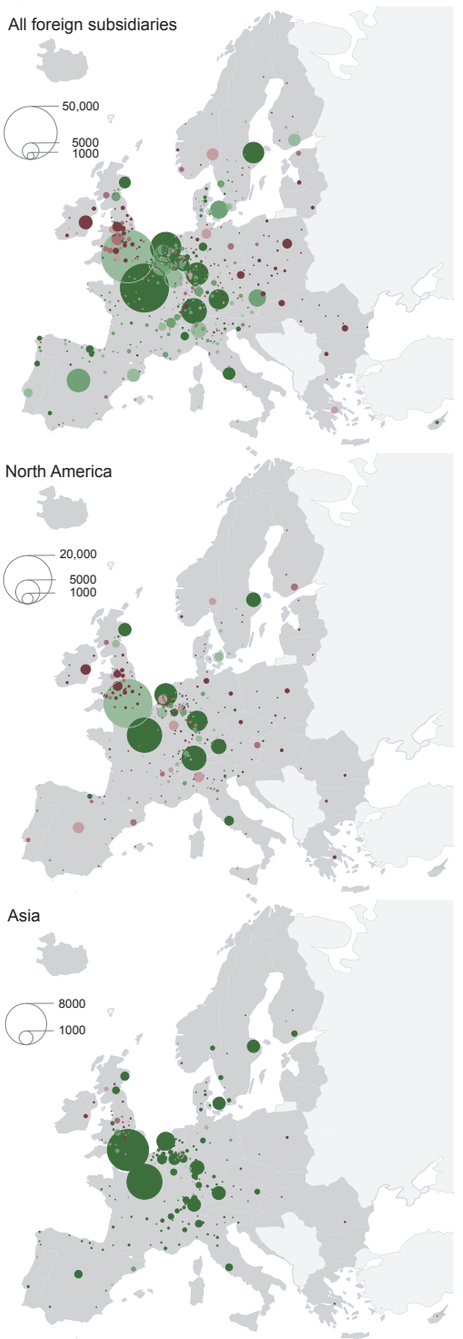
Source: Based on ESPON FOCI, 2010 and Eurostat

European poles of global integration

53 %

of the global multinational subsidiaries links occur inside Europe.

Control balance of foreign subsidiaries by FUA



Ratio of subsidiaries located abroad owned by headquarters in the FUA and subsidiaries in the FUA owned by headquarters abroad

-0.5 -0.25 0 0.25 0.5

Degree of control

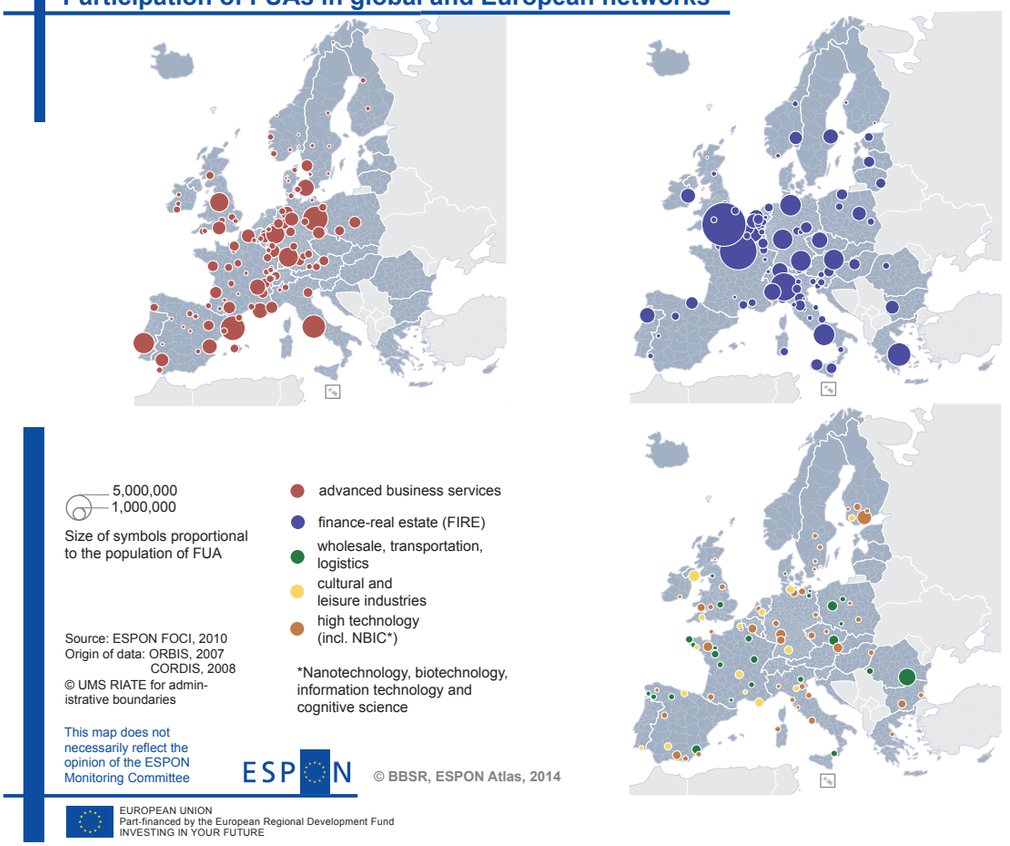
of subsidiaries in the FUA by headquarters from abroad

of subsidiaries abroad by headquarters in the FUA

Size of symbols proportional to the number of subsidiaries

Source: ESPON FOCI, 2010

Participation of FUAs in global and European networks



Large cities and capital cities have an important role as economic links between Europe and the rest of the world. The exchange of information and the investments in leading economic activities play an important role in understanding the embeddedness and vulnerability of cities in a global context. As such, they reveal that there is potential for future development. Cities show a further degree of integration by participating in global and European research networks such as the European Union's Seventh Framework Programme (FP7) and the subsequent Horizon2020 (2014-2020). The global and European dimension of integration of cities is also demonstrated by the involvement in the network of multinational firms and their systems of subsidiaries.

According to the connections within these networks, the global position of Functional Urban Areas (FUA), which include cities and their functionally integrated surrounding areas, ranges from global cities, such as London and Paris, to well integrated European cities – like Amsterdam, Brussels and Munich – , and cities with still noticeable international participation such as Oslo, Copenhagen and Geneva.

Taking a closer look at several sectors such as advanced business services, finance together with insurance and real estate (FIRE), high tech (including converging technologies), cultural and creative industries and transportation and logistics, a sector specialisation and gateway function of cities becomes apparent.

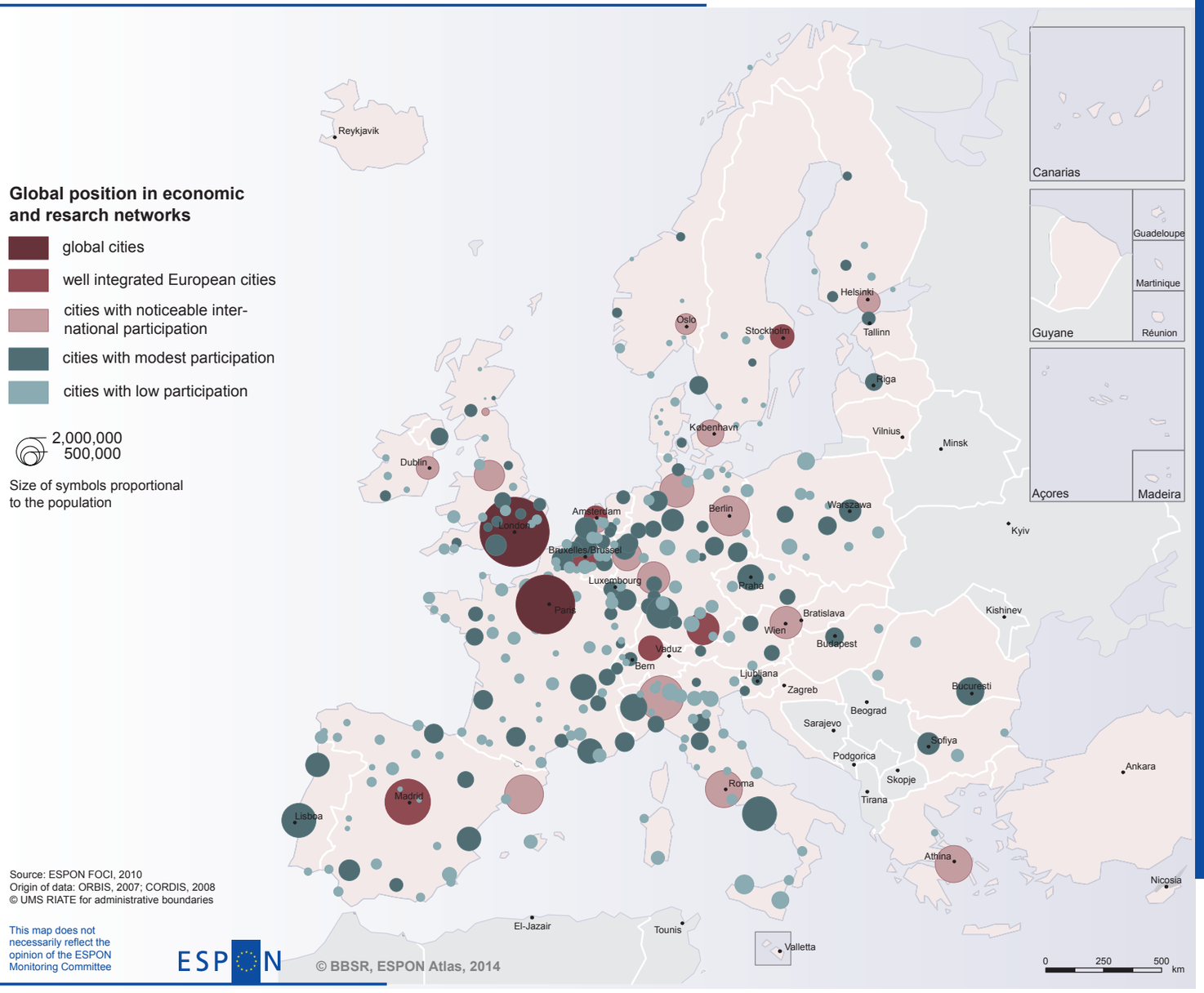
A first group of examples includes FUAs which are preferentially engaged in advanced business services. A second group is specialised in the FIRE activities, such as the major European financial centres, but also almost all capital cities of Eastern Europe.

Small cities tend to specialise mostly in transportation and logistics, but also in cultural and leisure industries. Cities specialising in activities involving high technology, including the so-called 'converging technologies' (e.g. nano-technologies, biotechnologies, information technologies and cognition) have only a few specialised connections in the global economy.

The importance of cities as centres of economic decision-making is determined to a greater degree by the presence of the headquarters of national or multinational companies in the city and also by the network of subsidiaries controlled in other regions and cities. A good indication of this is the balance between controlled subsidiaries from a city and the subsidiaries located in this city but controlled from outside. Furthermore, the hosting of externally controlled subsidiaries and assumed dependencies also show the strategic importance and dynamics of the city.

From a global perspective, European FUAs tend to control subsidiaries instead of disposing of subsidiaries that are controlled from other countries outside Europe. London, Helsinki, Vienna and Madrid may be called the centres of 'foreign control'. Cities in Eastern European and in the Midlands, in the UK appear mainly controlled from abroad. The external control is located more often than not in the headquarters located in North America. In Asia, the degree of European influence is strong at the moment. Only the Midlands, in the UK and the capital cities of Eastern Europe show some external control from Asia.

Participation of Functional Urban Areas in global and European networks



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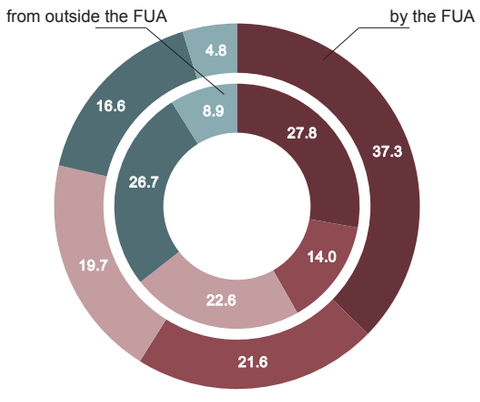
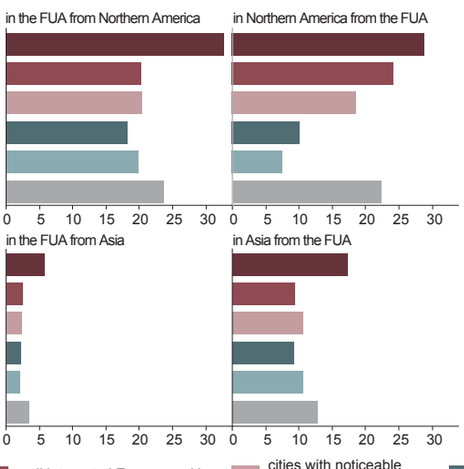
Structures and control balance of FUA subsidiaries

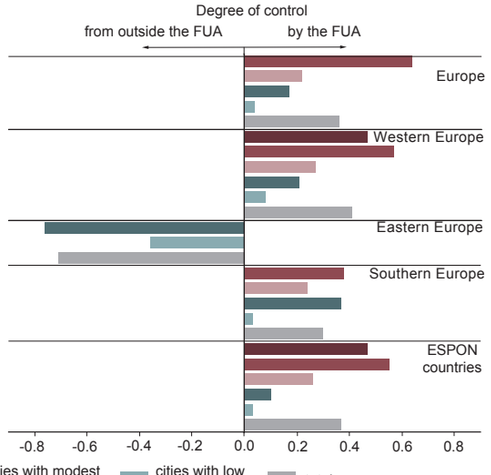
Percentage of subsidiaries controlled



Percentage of international subsidiaries controlled



Control balance of international subsidiaries



global cities | well integrated European cities | cities with noticeable international participation | cities with modest participation | cities with low participation | total

Source: Based on ESPON FOCI, 2010

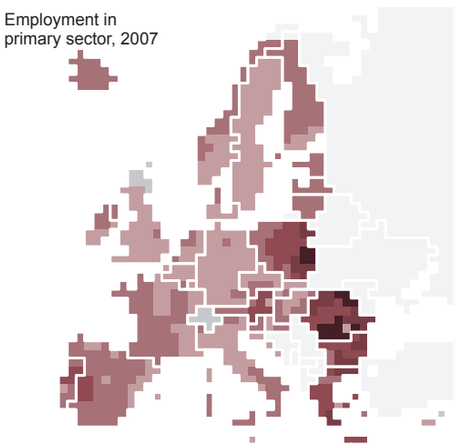
Characteristics and potentials of rural territories

12 **hectares**

is the land size that an average EU farmer has.

Agricultural indicators

Employment in primary sector, 2007



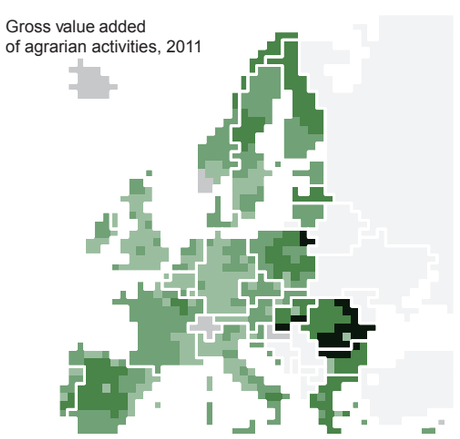
Percent with respect of total value

5 15 25 35

no data

Source: Eurostat, 2007

Gross value added of agrarian activities, 2011



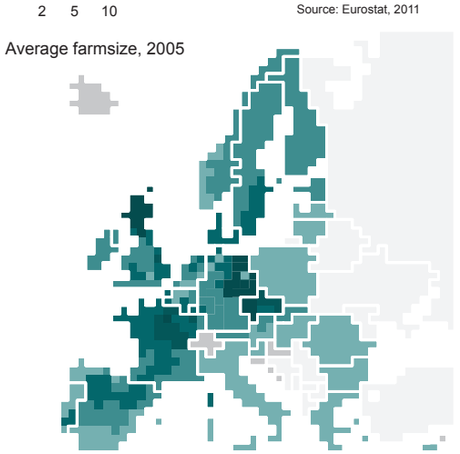
Percent with respect to total value

2 5 10

no data

Source: Eurostat, 2011

Average farmsize, 2005



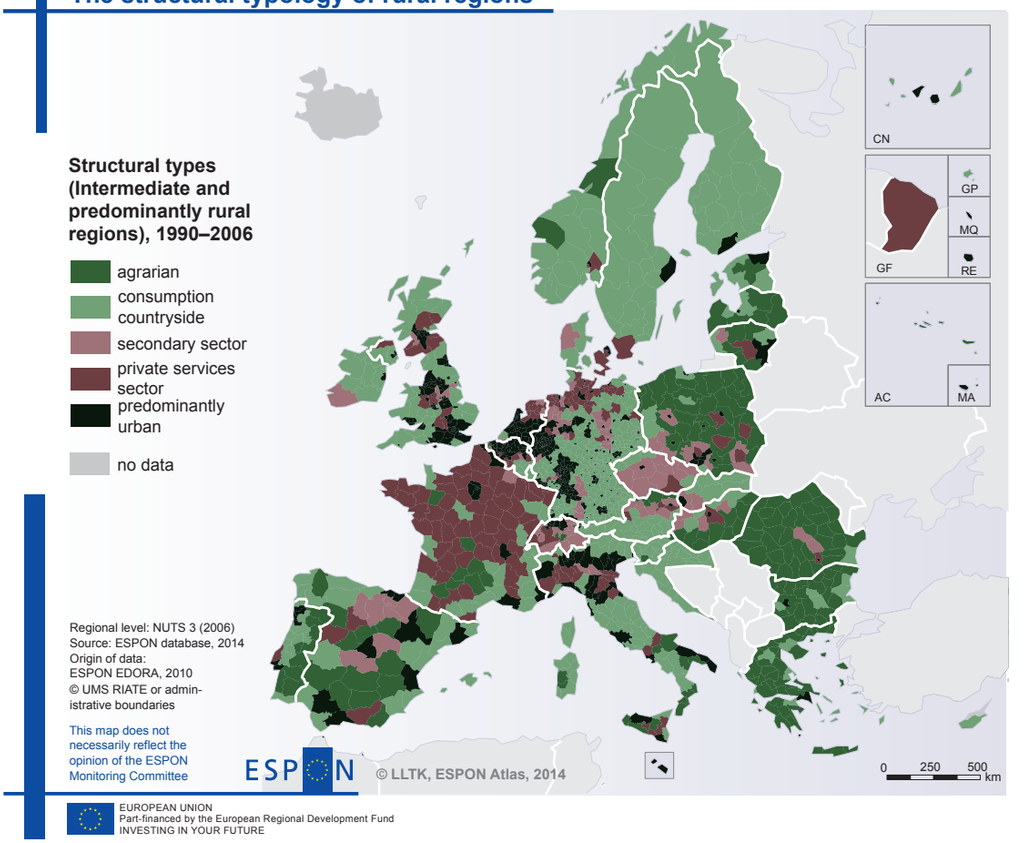
Average agricultural holding size in (ha)

20 40 70 100

no data

Source: Eurostat, 2005

The structural typology of rural regions



In Europe, rural areas occupy a major part of the territory. However, these areas are often more heterogeneous than it might seem at first glance.

The structural typology of rural areas allows for a distinction to be made amongst the non-urban regions in terms of their socioeconomic performance. The findings of this typology point to economic diversification of agrarian regions as one of the key objectives for targeted horizontal policies such as Axis 3 under Pillar 2 of the Common Agricultural Policy (CAP), Cohesion Fund policies and Convergence Objective policies. It draws on the discourse regarding territorial and sectoral policy, and the shift from productivity towards new functions, highlighting the importance of public goods produced in the countryside, and the concept of "consumption countryside".

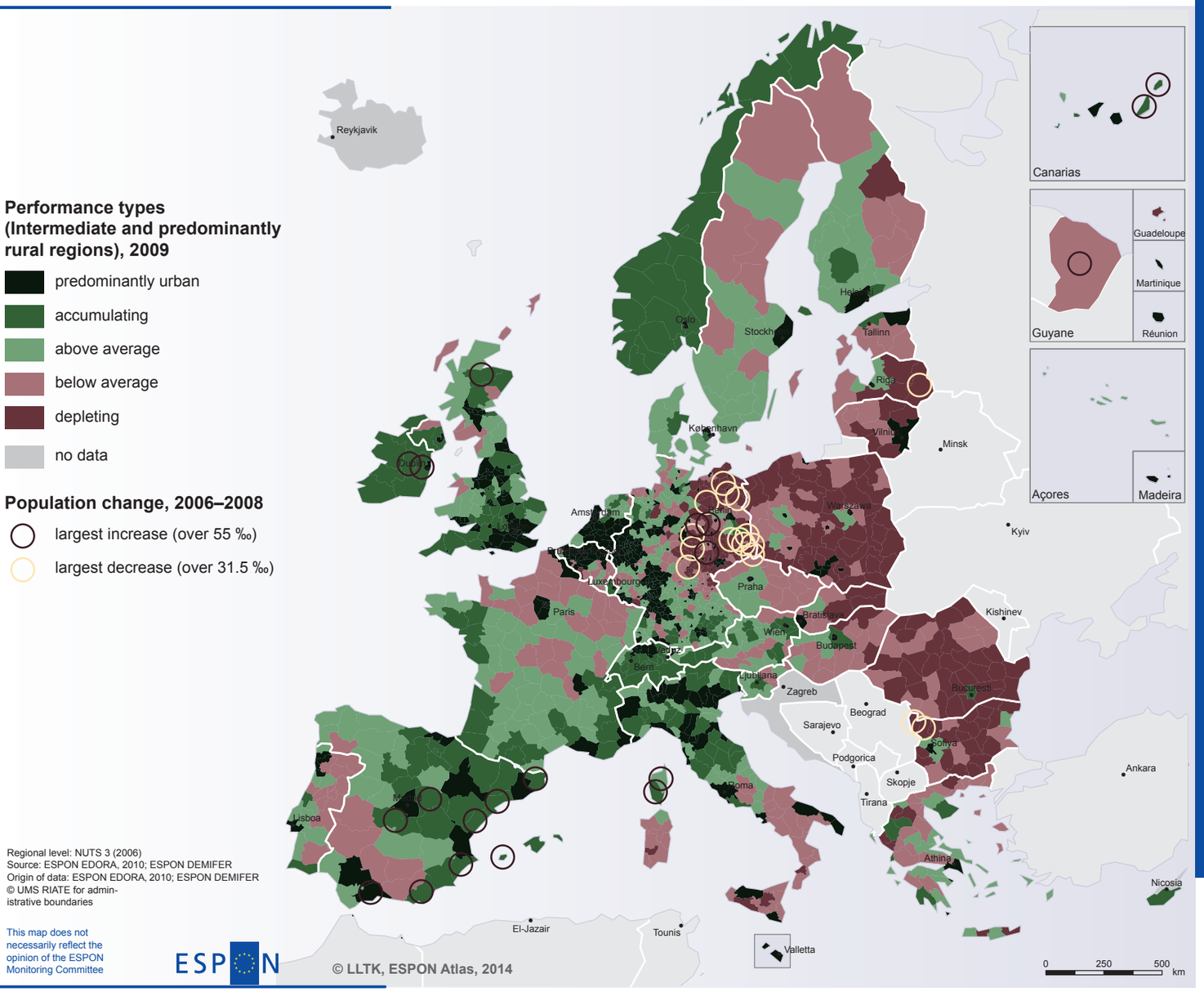
Rural regions with primary sector dominance in the local economy are mainly concentrated in an arc stretching around the Eastern and Southern rims of Europe. Rural regions from the South and South East often have tourism as the main economic activity. In this case, the countryside is less about production and more about consumption where visitors come for recreational purposes. These consumption countryside regions have diversified their small scale infrastructure.

The rest of the rural space is characterised by diversified regions with a focus on secondary or private sector services. Here the employment structure is not dissimilar from the urban regions. Consumption ruled countryside and diversified regions with a focus on private sector services tend to achieve a good level of economic performance and are likely to continue to do well in the immediate future.

Rather than becoming more uniform in character, rural Europe is becoming increasingly diverse. This diversity creates both new challenges and also new opportunities. Many of these types of regions have grown more slowly economically, socially and culturally. However, there are also regions with the potential to connect better to European or global economic flows. From a holistic perspective, local and individual change processes are merging, thus they compile together a broader structural transformation. In rural economies, this change is associated with changes in the robustness and capacity of local communities, which are linked in complex ways to rural governance. In this respect the provision and maintanance of services and the access to them are of crucial importance.

The performance of these regions is placed on a continuum between "depletion and "accumulation", and is determined by the combined effect of net migration, GDP per capita, average annual change in GDP, average annual change in total employment, and unemployment rate. The geographical pattern of performance depicts a clear concentration of 'depleting regions' in the Eastern Member States, both in peripheral and inner geographic location. Mediterranean regions mostly are below the average of the performance indicator, which may be linked with inherent structural problems. The highest rates of "accumulation" are found in Western European countries.

Performance typology of rural regions



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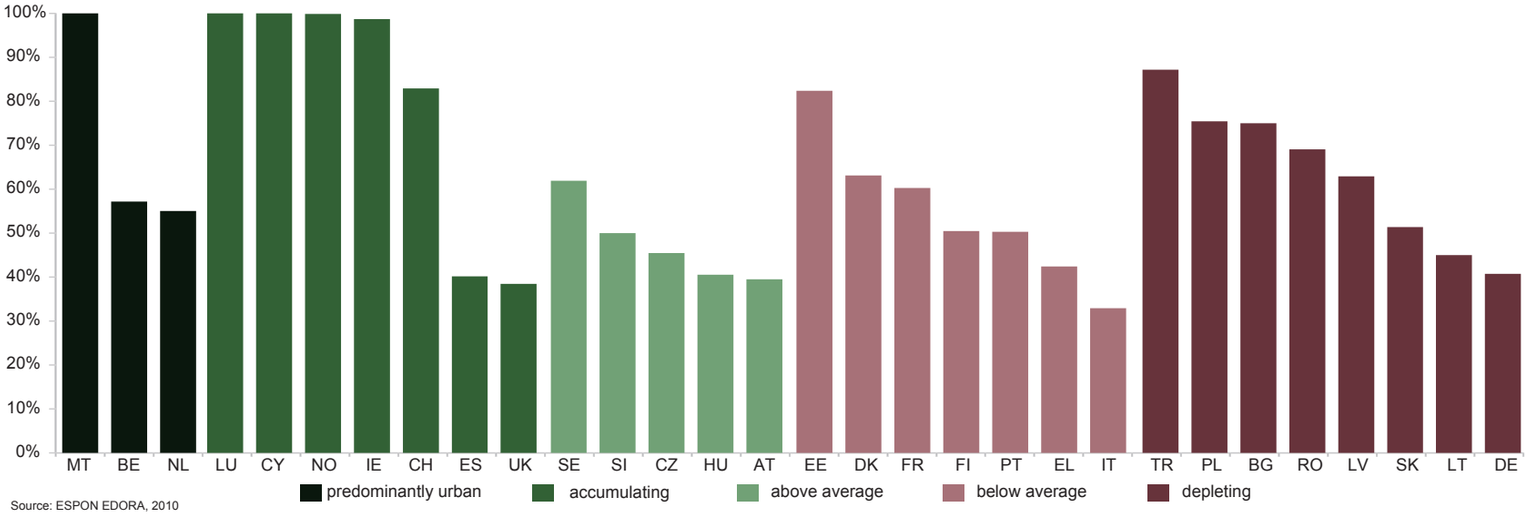
Share of dominant performance in European countries, 2010



Source: ESPON EDORA, 2010

Urban and rural regions – territorial synopsis

The European urban fabric is characterised by functionally diversified cities and metropolitan regions of different sizes and at different regional scales. They play distinct roles in the European and respective national economic and territorial development. In their accumulation and combination of economic, poltical and cultural functions they serve as urban hubs of global embeddedness and territorial development.

As varied as the functional strength and orientation of the cities are also the developments concerning their population. A lot of cities in Western Europe are growing. In Eastern Europe mainly the capital regions do grow while second tier and smaller cities show signs of population decrease.

Rural areas and small and medium sized town also play an important role in territorial development in Europe. Towns are important for rural areas because they provide basic services.

Rural regions are not one homogenous group but they are confronted with different and divergent interests by different stakeholders and show distinct characteristics, depending on if they are economically more dependent on agriculture ('Agrarian Europe') or on industrial activities ('Industrial rural Europe'). In some rural regions the territorial orientation is charcterised by demands from both agriculture and natural and ecological preservation and as well from tourism .

Each of these regions needs specific territorially embedded development strategies. The regions in 'Agrarian Europe', mainly with intensive, but less technological agricultural production, need a solid economic development with the primary sector as base.

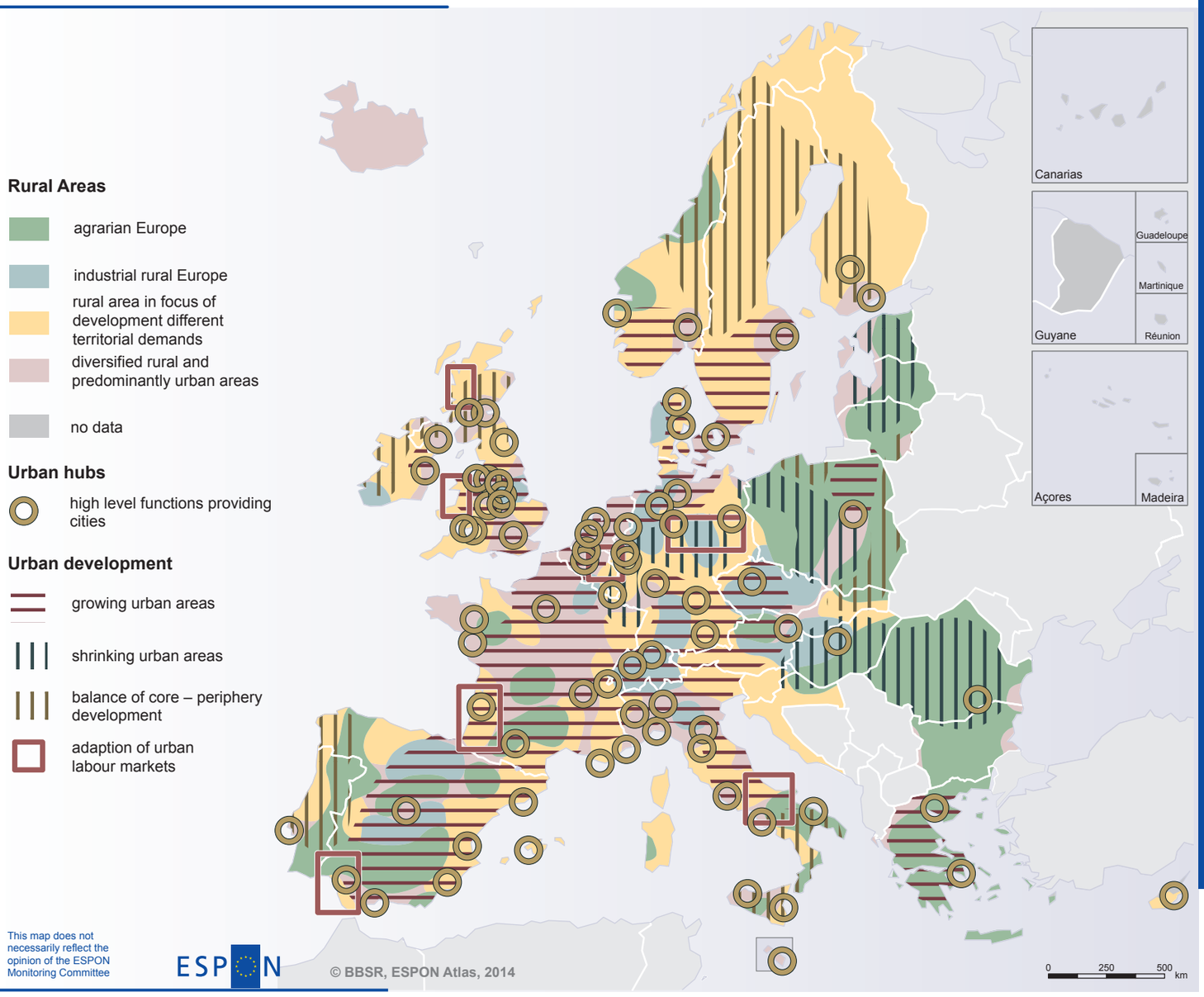
The industrial rural regions are mainly situated next to or in-between urban spaces. Territorial strategies in these regions should focus on the preservation of rurality as well as on addressing the diverging claims on utilisation of space.

In rural areas with different and divergent interests the questions of territorial consistency are evident. In expanding urban areas there is a need for integrated development strategies to deal with immigration, growing land consumption and related infrastructural needs. In some parts of Europe, infrastructural demands lead to questions of the duration of growth and for how long additional efforts are needed.

In almost all Member States the challenge exists in some rural areas, depending on their territorial context and the size of their towns, to stabilise the provision of basic services.

Territorial strategies should aim at addressing the issues of a shrinking population in some urban areas, public income and tax, labour opportunities and knowledge retention and development. Furthermore, public services and maintenance of infrastructure have to be adjusted.

Urban and rural regions – territorial synopsis



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III. Society and integration

Over the past six decades, Europe has seen greater integration and cooperation, and has experienced unprecedented economic growth and prosperity. During the recent economic crisis these achievements have been under threat.

The European Union and its predecessors were created with the aim to achieve common political goals. The success of this unique economic and social project has convinced more and more European national governments to become members of this community.

The first European institution, the European Coal and Steel Community (ECSC) was established in 1951 by six founding members. ECSC covered an area of 1.3 million km² with a population of roughly 170 million people. After Croatia joined the EU as its 28th member, the EU now covers an area of over 4 million km² with a population of 506 million people², representing 7.3% of the world's population. The area of ESPON, which includes the EU countries plus the EFTA members Norway, Iceland, Switzerland and Liechtenstein, covers an even larger area of 5.1 million km² with a population of 521 million people.

In more than six decades of European integration, the people of Europe have experienced strong economic growth, higher and more evenly distributed education, equal rights and an increase in the participation of all social groups, especially women, in the labour market. As a result, the EU has created a better society, a better health and education system, which led to an overall improvement in the quality of life.

The EU policies, which aim to ensure the free movement of people, goods, services, and capital, led to open borders, increased trade and cooperation. Migration between the European countries and regions also grew significantly.

Europe is a major economic power in the world. However, its position in the world has changed in the last 20 years, driven by globalisation and technological changes, especially the Internet. Furthermore, this change has created a number of territorial challenges, which all affect European society as a whole. European regions are increasingly exposed to globalisation, which makes them vulnerable to external threats. This vulnerability is however very unevenly distributed and therefore regions can be affected asymmetrically.

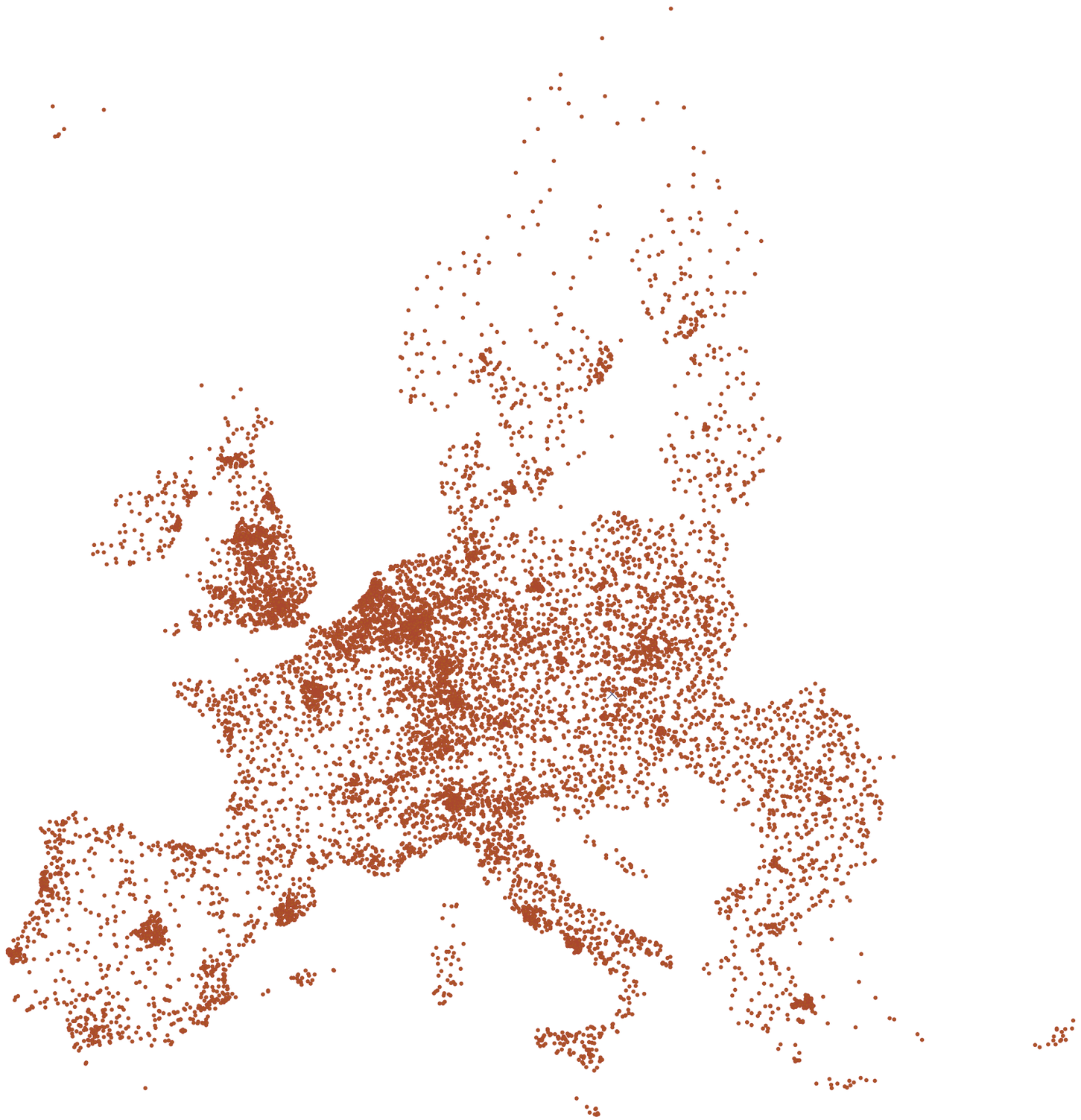
In addition, Europe is facing increasing demographic challenges which are specific to different countries and regions. Furthermore, ageing and depopulation will bring about changes in many regions, which may impact on social and territorial cohesion, public service provision, labour market and housing. In contrast, other regions have experienced population growth and this leads to a different type of challenges and necessary interventions.

Intra-European migration grew significantly after the last rounds of EU enlargement. The migration flows were mainly East-West, but there were also flows coming from less-developed non-EU countries into Europe. These constitute specific challenges but also present opportunities.

Although economic welfare and social well-being have grown significantly all over Europe, socio-economic exclusion is still a reality which has been made worse by the economic crisis. Socio-economic exclusion has a strong territorial character: The risk of exclusion is higher in areas with low accessibility, weak economic performance, lack of social opportunities or other specific territorial circumstances.

The global economic downturn has revealed structural weaknesses in many countries and regions in Europe, regardless of their level of economic and social development. The crisis has brought both the growth and the convergence experienced before 2007 to a halt.

Population



• 50,000 persons

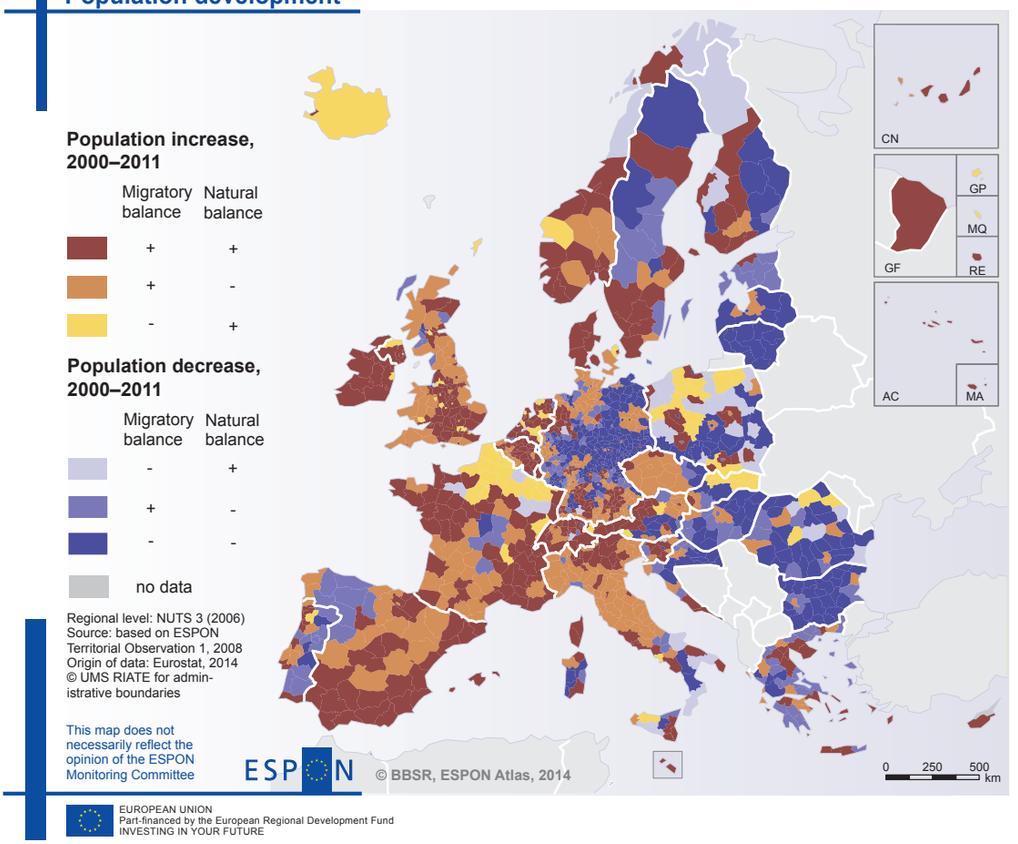
Regional level: NUTS 3 (2006) Source: ESPON database, 2012

Demographic change

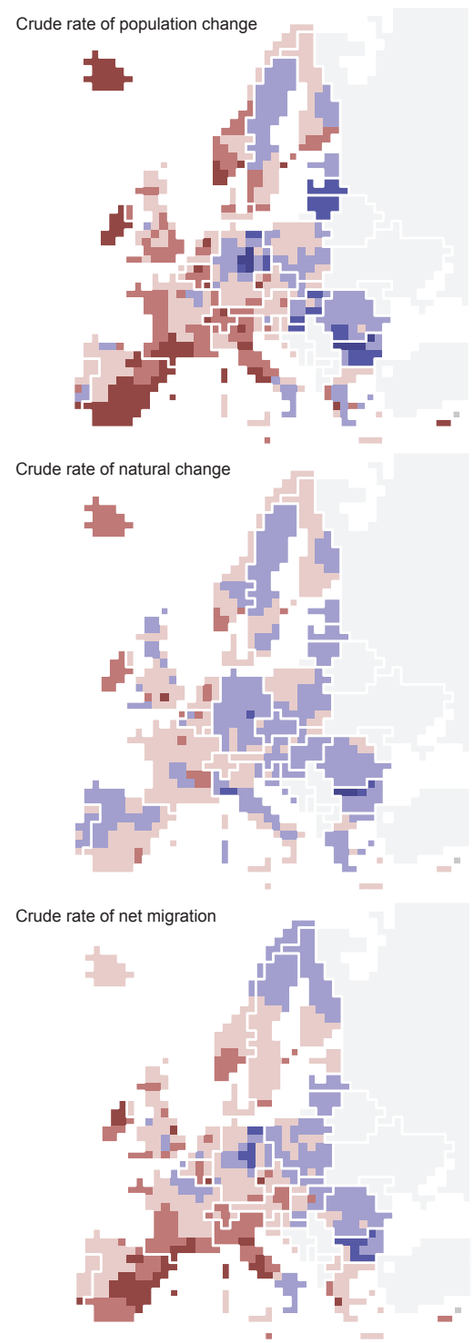
522 **million persons**

were living in the ESPON countries in 2011, 7% more than in 1990. Change rates in this period vary between -16% in Latvia to +40% in Cyprus.

Population development



Demographic change



Source: ESPON database, 2012

Europe's population is growing slowly. Since 2000, the annual average growth rate has been below 0.5 per cent per year, which is similar to other developed countries, but modest in comparison to other world regions.

Population growth is unevenly distributed across the ESPON countries. A trend of East-West polarisation of the pattern of demographic development has been observed between 2000 and 2011. Regions with population growth are mainly located in Central-Western and Southern-Western Europe while regions with population decline are more dominant in Eastern Europe. Capital regions in Europe are hotspots of demographic development, mainly due to inward migration; in several cases, they also show a considerably high rate of natural change. In particular in Eastern Europe, the immediate neighbouring regions to capital cities have had significant population growth compared to the inner parts of the capital region.

At European level, natural population growth has a very small impact on the increase of the population today. Migration plays a key role for population growth in Europe and has counterbalanced the impact of negative natural population growth in many regions. This also underlines the importance of migration for regions and highlights their contribution to European competitiveness and cohesion.

Due to high fertility rates in several European countries in the mid-1960s, the so-called 'baby boomer generation' represents the largest population of this age group. Furthermore, it represents a significant share of the working-age population. The first of these large cohorts born over a period of 20-30 years is now reaching retirement age.

The population in Europe is becoming older, due to an increase in life expectancy and consistently low levels of fertility over the past decades. Population ageing is a phenomenon which occurs in all EU Member States and it is expected to continue in the coming decades.

The relatively low contribution of natural change to total population growth at a European level is the result of two factors: firstly, net migration in Europe has increased considerably since the mid-1980s; secondly, the number of births has fallen, while the number of deaths has increased. The gap between births and deaths has considerably narrowed since 1960. This is mainly due to changes in the birth rates, which nearly halved during this period.

The number of deaths is expected to increase, as the baby boomer generation grows older. Assuming that fertility remains at a relatively low level, a negative natural change (e.g. more deaths than births) may occur in the future. The extent of population decline or growth will be even more reliant on the contribution made by migration.

In 2011, 5.2 million children were born in the EU. The highest annual total for the EU was recorded in 1964 when there were 7.7 million births. Fertility in Europe is among the lowest in the world; currently women in Europe on average have 1.5 children, while 2.1 children are needed to replace the existing population. Only a very small

number of European regions show a stable fertility rate above the so-called 'replacement threshold'. Iceland and Ireland have had and continue to have one of the highest fertility rates whereas Northern and Western Europe have seen a decrease in their fertility rates since the 1970s. However, in the last couple of decades the Nordic countries and several Western countries have seen a rise in their fertility rates. Southern Europe saw a significant decrease in their fertility rates in the 1980s, while Eastern European countries experienced a very steep decrease at the beginning of the 1990s. At the beginning of the last decade, the total fertility rate in the EU showed signs of renewed increase. After bottoming out between 2000 and 2002, the fertility rate increased again in most Member States in the nine years to 2011. However, the rise has not been sufficient to reverse the trends in population growth and ageing.

Regions with high out-migration also have a tendency to show low fertility rates. The low level of fertility is the main cause for the low rate in population growth and for population ageing. The rate of ageing is reinforced by the increase in life expectancy.

Economic development and the improvement in environmental conditions, improved lifestyles, advances in healthcare and medicine, including reduced infant mortality, have resulted in a continuous and rapid increase in life expectancy across Europe during the last century. This process has been going on for longer in Europe than in most other countries, making the life expectancy in Europe one of the highest in the world.

Besides the reduction in fertility, the gradual reduction in mortality is the main factor contributing to the ageing of the population in Europe. While life expectancy is rising in all EU Member States, major differences still exist amongst them. Regional differences within the individual countries are very small, but the difference in longevity between men and women are significant, and in some countries the longevity gap is very significant. However, the gender gap is narrowing slowly.

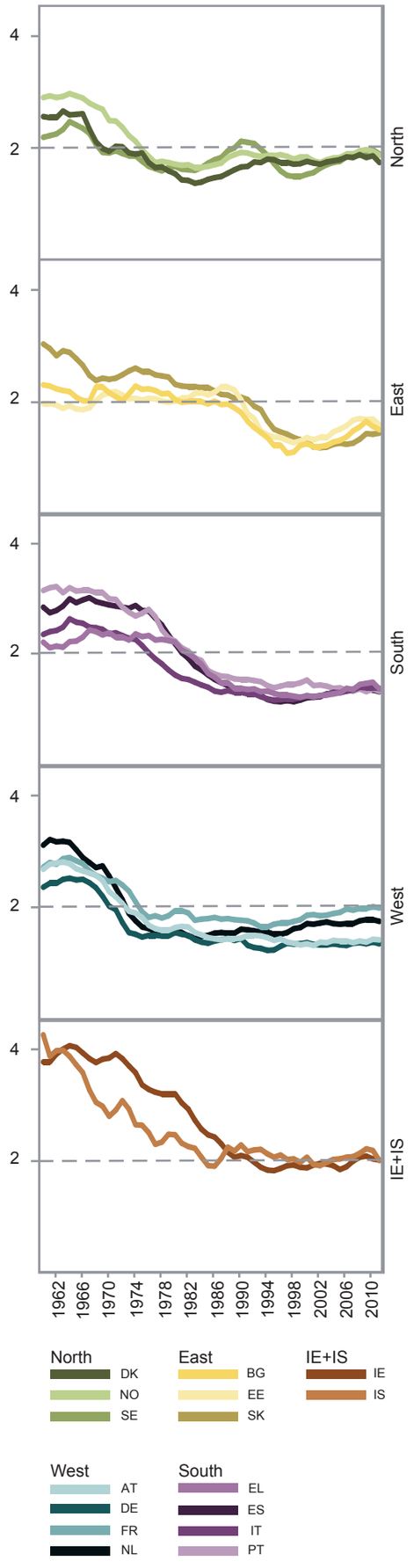
High life expectancy has an upward effect on both population growth and ageing. Regions with low fertility, high life expectancy and negative net migration will experience more ageing than other regions.

Persistent low fertility, increasing longevity and negative net migration are the driving forces behind population ageing. The slow pace of European population growth gives rise to the major demographic challenge of an ageing population.

The statistical relationship between different age groups can be shown through age dependency ratios. They measure the relationship between one age group that in one way or the other supports another age group, which due to its age structure is most likely to be economically dependent on the other group, which is most likely to be economically active.

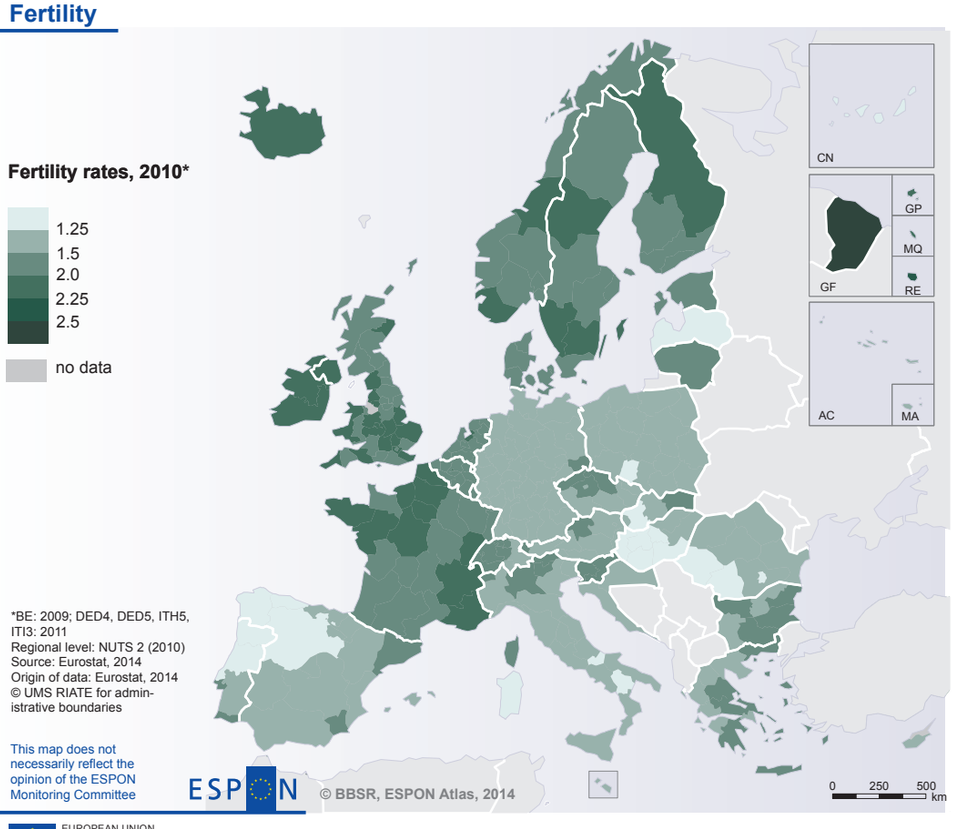
The old age dependency ratio serves as an indicator of the pressure placed on the working-age population (aged 19-64) to support old-age population (aged 65+). The increase in old-age dependency is expected to contribute to higher public spending in health, long-term care and pensions.

Development of fertility rates in Europe (selected countries)



Source: Eurostat, 2014; OECD, 2009

Fertility



*BE: 2009; DED4, DED5, ITH5, ITI3: 2011
Regional level: NUTS 2 (2010)
Source: Eurostat, 2014
Origin of data: Eurostat, 2014
© UMS RIATE for administrative boundaries

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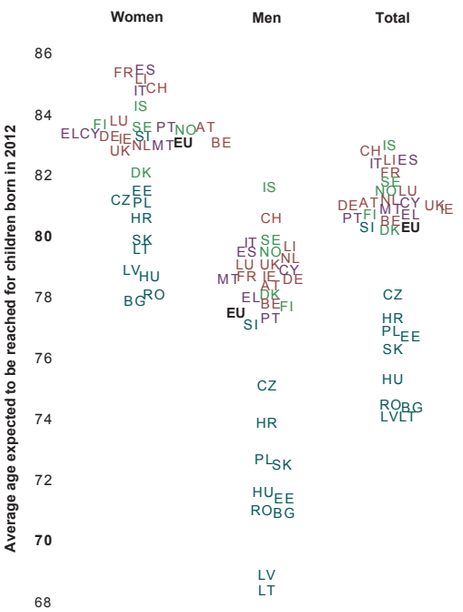
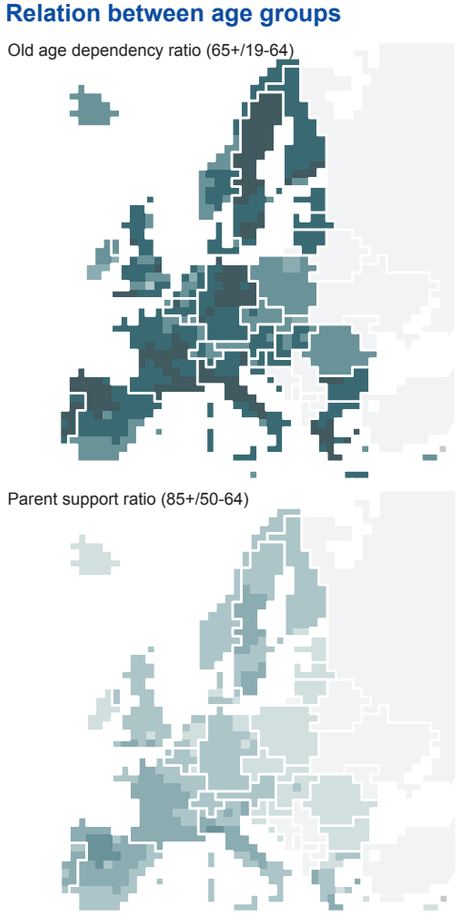
Life expectancy at birth



Central and Western Europe
Eastern Europe and Baltic States
Southern Europe
Nordic countries
EU average

Source: Eurostat, 2014

Relation between age groups



Source: Eurostat, 2014

As the population grows older, also the number of the oldest old (aged 85+) grows. This increases the pressure on families to provide support for their oldest members. This is expressed through the parent support ratio, which relates the very old age groups (85+) to the generation of their (presumed) children (aged 50-64).

The demographic diversity of the European regions can be assessed through a typology that groups the regions into seven different types. It should be noted that the data available refer to the period before the economic crisis.

"Euro Standard" type comes close to the overall average of the ESPON countries. Overall, a stagnating natural population balance and a positive net migration rate are prevalent. "Family Potentials" type has a slightly younger than average age structure and high natural population increase, as well as a positive net migration rate.

"Challenge of Labour Force" type features a high young working-age population and a slight population decline, driven by a negative natural population change. "Challenge of Decline" type is shaped by a negative natural population balance, as well as a negative migratory balance.

"Challenge of Ageing" type is characterised by older populations and natural population decrease. The overall population size is still increasing due to a strong net migration surplus. "Young Potentials" type features a young age structure, a positive natural population increase, as well as a strong migratory surplus.

"Overseas" type shows a considerable high share of young population and by far the lowest share of old age population. The strong natural population increase is more than counterbalancing the negative migratory balance. These types of regions are affected in different ways by the main demographic challenges that Europe faces as a whole: overall population decline, demographic ageing and a shrinking and ageing of the labour force.

Population decline is a demographic challenge, first and foremost, for regions of the "Challenge of Labour Force" type and even more for the "Challenge of Decline" type. These two types of regions, and also the "Challenge of Ageing" type to some extent, must be made aware of the impact of low fertility.

All other types of regions were able to compensate the low fertility by immigration. Only in the case of the "Overseas" type, the level of fertility was high enough for natural replacement to avoid the population decline.

The challenge of demographic ageing is most prevalent for the "Euro Standard" type, "Challenge of Ageing" type and "Challenge of Decline" type. In "Euro Standard" type regions, the speed of ageing is moderate due to reasonable fertility rates and a predominately positive migratory balance. In the "Challenge of Ageing" regions, the impact of demographic ageing is somewhat alleviated by a strong inflow of younger migrants. In the "Challenge of Decline" type regions, however, the already dominant process of demographic ageing is further affected by the widespread emigration of young people.

The relatively low share of elderly in „Challenge of Labour Force" type regions can largely be explained by the last strong birth cohorts born before 1990, and because of the lowest life expectancy of all types of regions. It is not due, though to consistent positive demographic patterns.

The share of working-age population is around average in "Euro Standard" type, "Family Potentials" type, and "Challenge of Ageing" type. It is still increasing, which is mainly due to increases in the older working age population (55 to 64 years), while the proportion of younger adults was already decreasing during the period 2001 to 2005.

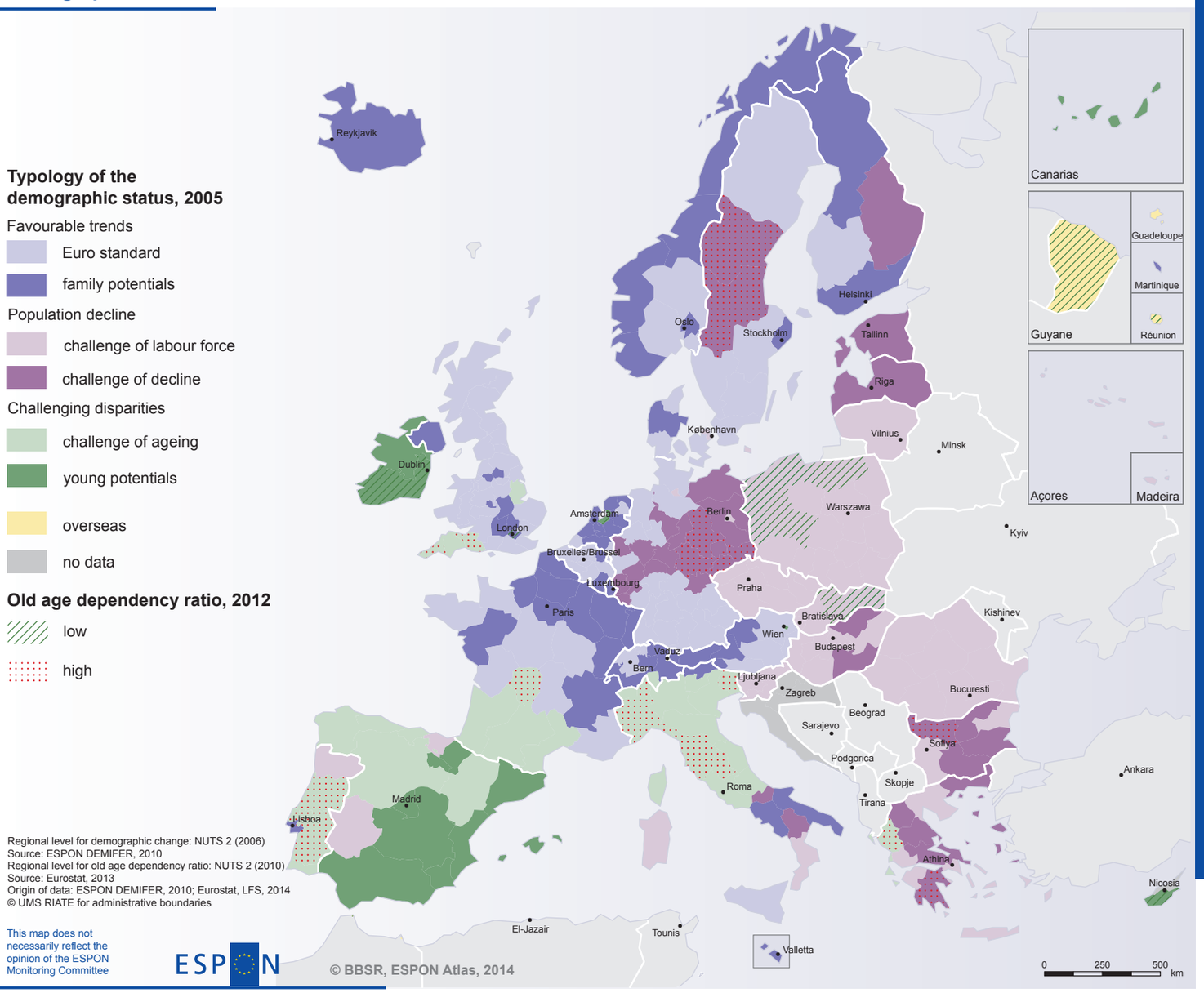
The share of working-age population is also around average in the "Challenge of Decline" type regions. The size of the entire working age population is already shrinking; in particular, a decrease in the share of the younger working-age population has been noted.

In the "Challenge of Labour Force" type regions, the proportion of the working-age population is still well above the overall average. However, the demographic supply of young people will fall sharply in the near future, as fertility fell sharply after 1990. The current high share of young adults is due to the last sizeable age cohorts reaching the working-age. In the foreseeable future there will be a shortage of younger adults in regions of this type.

The share of working age population is clearly below average in the "Overseas" type regions; however, if these regions can prevent emigration of high proportions of younger people, the share of the working-age population will increase considerably in the coming years.

The crisis has changed considerably the demographic and migratory patterns in several European regions. It should be noted that almost all regions in Europe are expected to experience challenges regarding the size and ageing of the labour force.

Demographic status



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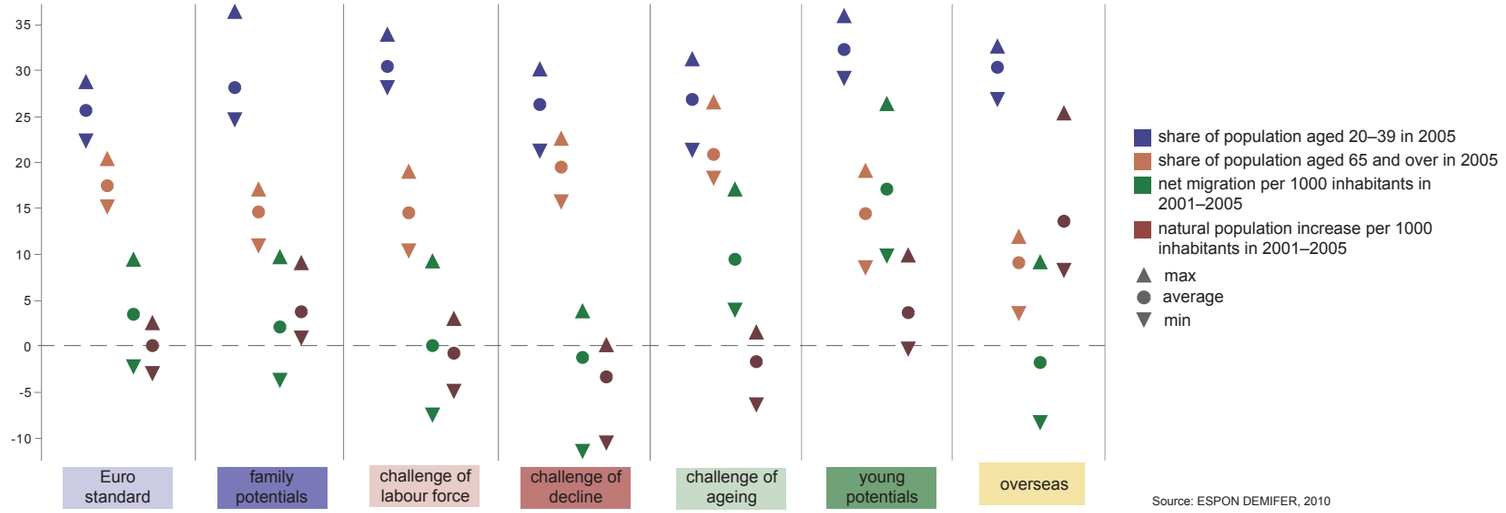
Characteristics of the demographic status types



Source: ESPON DEMIFER, 2010

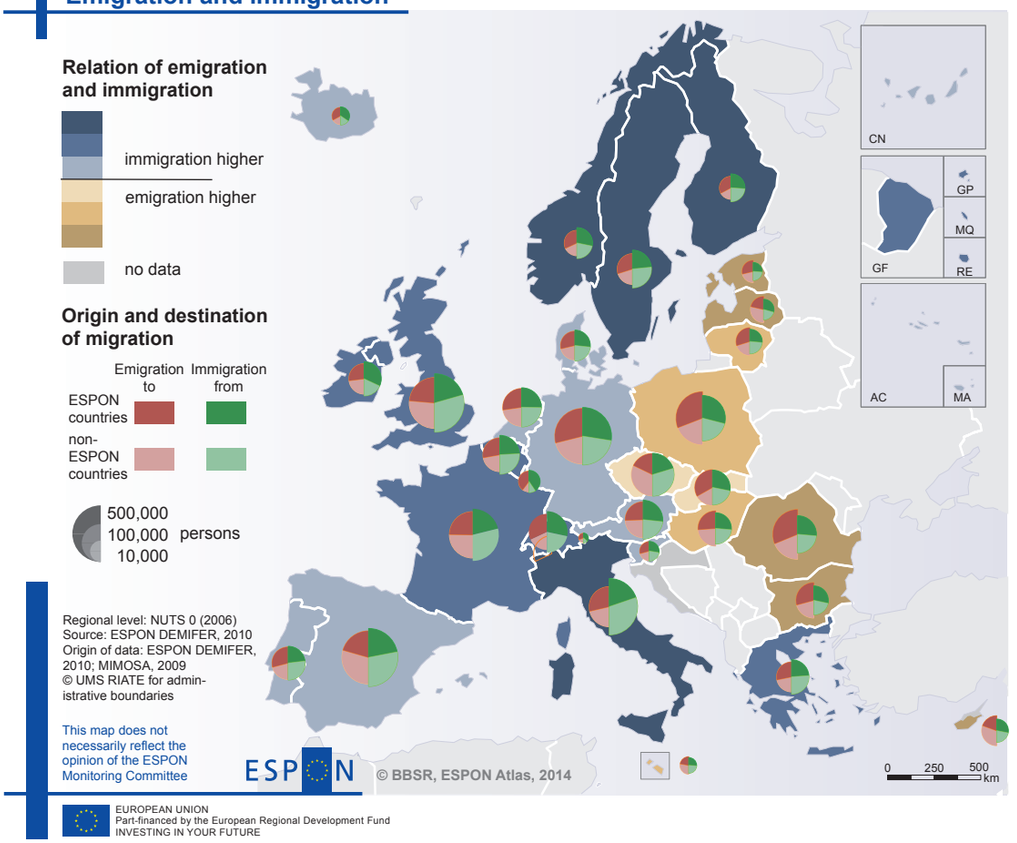
Migration and mobility

4.7 **million immigrants**

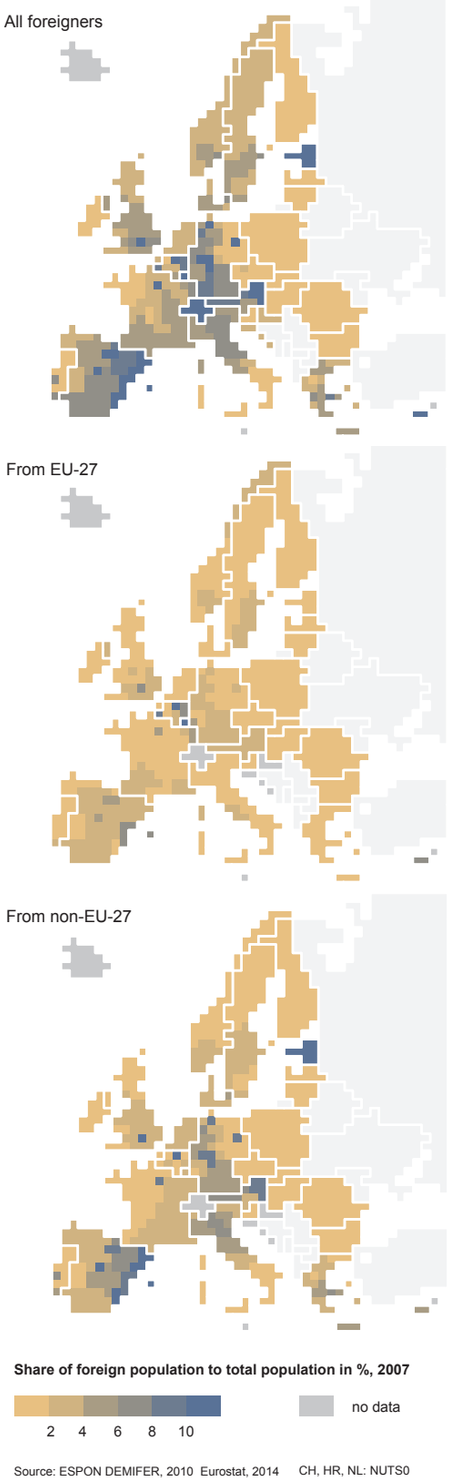
entered an EU country in 2006, whereas 3.6 million persons were leaving.

More than half of the immigrants arrived from outside the European Union.

Emigration and immigration



Foreign population



International and long-distance interregional migration flows are largely driven by economic motives. Countries in Northern, Western and Southern Europe have experienced a positive migratory balance, while the Eastern European countries have experienced a negative migratory balance – in some cases three times as many people leaving the country than entering it.

The migratory balance between different regions of a country can vary considerably compared to a country's overall migratory balance. Rural regions, but also old industrialised areas very often lose population despite an overall migratory gain for the country affected. At the same time most of the regions from the former socialist economies are losing population through emigration.

In Eastern Europe, those regions that have managed to maintain a positive migratory balance in spite of the overall migratory loss of the country, owe this mainly to international migration. Western Europe is the preferred destination for most intra-European migrants, as only 5% of international migrants went from one Eastern European country to another.

Regions that are less attractive for migrants tend to attract also fewer internal and external immigrants. Regions where both migration components are negative are found mainly in Poland, Bulgaria and Romania.

Two thirds of the migrant population in Europe are non-EU citizens, and one third are citizens of another EU country. Immigrants from non-EU countries tend to be less educated than EU nationals. Migrants from EU countries, however, tend to include a considerably higher share of tertiary educated persons compared to the national population of the host country . Most of the foreign migrants are of working age and the 15-64 years old group is higher than the national population.

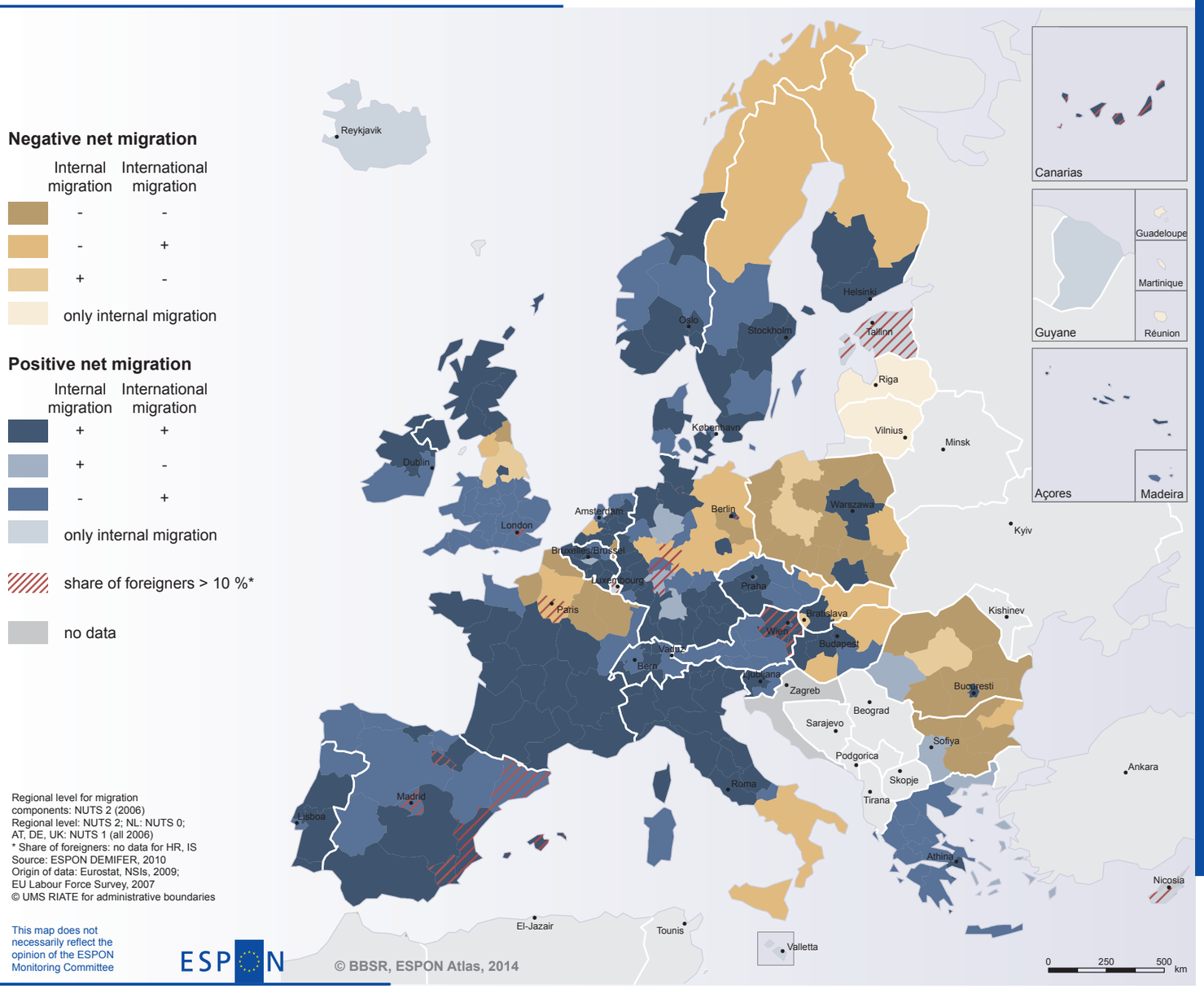
There are also different migration patterns between men and women. More young men than women live in island regions and other peripheral regions whereas capital city regions see more young women than men.

A significant outflow of young women often leads to a reduction in births, which in the long run can have a negative impact on educational and social services. This often leads to a vicious circle of decreasing fertility and to an increase in old age population.

Migration patterns also depend on the age of the migrants. For example, urban regions, especially those that encompass the capitals, are more likely to attract young people and encourage older people to move out.

This analysis is based on data from 2005 to 2007. It should be noted that migratory flows in Europe have changed significantly since the economic crisis.

Internal and international migration in European regions



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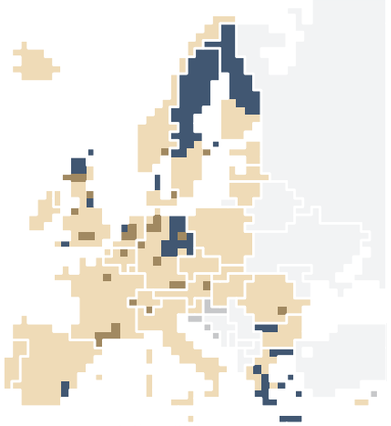
Strong relative sex overrepresentation



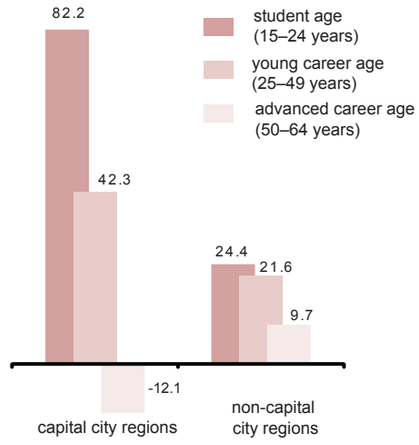
Strong overrepresentation, 2007

young women (20–29)
young men (20–29)
no data

Source: based on ESPON DEMIFER, 2010

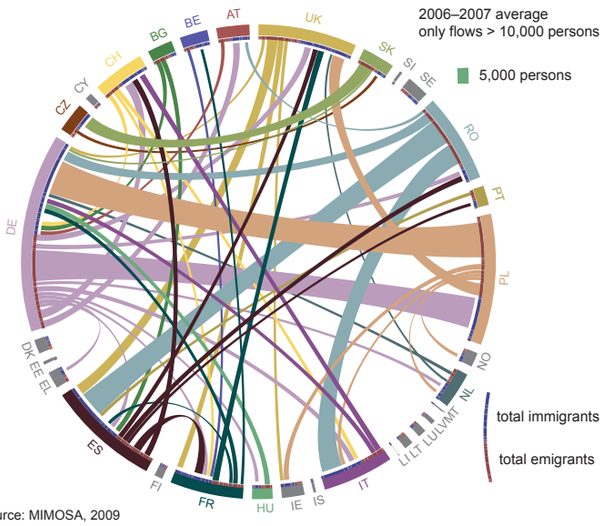
Age group-dependent migration to/from city regions

Net migrants per 1000 inhabitants, 2007



Source: ESPON ATTREG, 2011

Major migration flows between ESPON countries



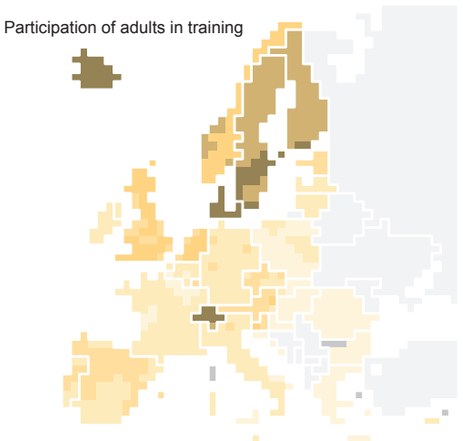
Source: MIMOSA, 2009

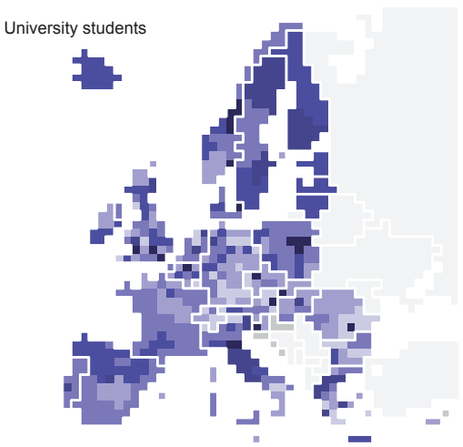
Education and labour force

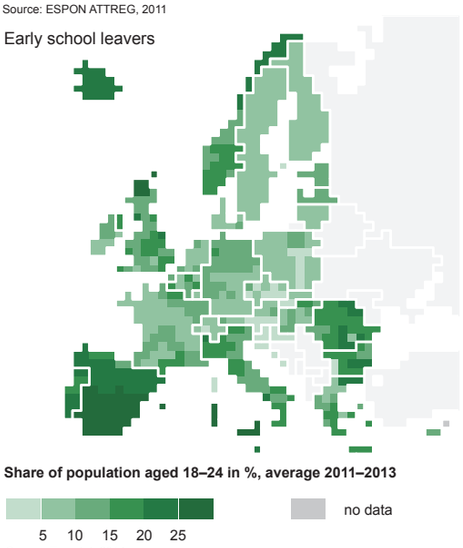
28 European universities

can be found among the world's top 100 universities, the majority of them located in the UK and Germany.

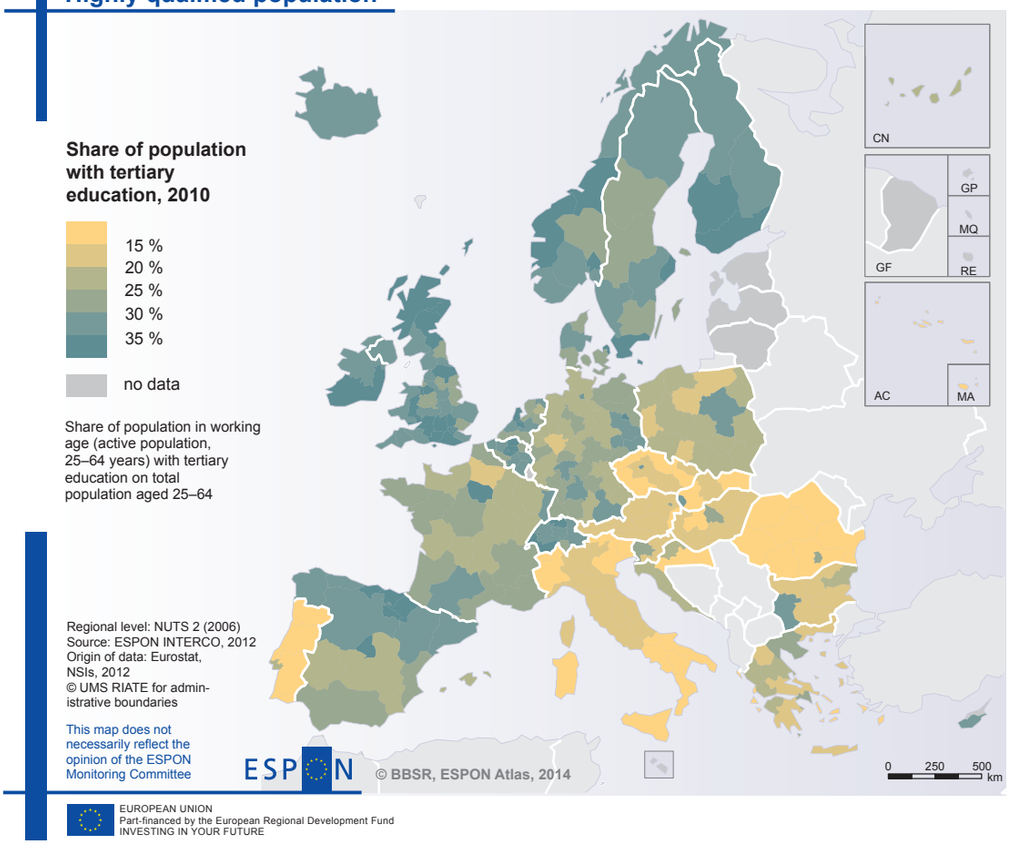
Participation in education and training







Highly qualified population



In order for all citizens to participate fully in society and to be able to contribute to economic growth, to prevent poverty and to improve employability, a basic level of education is required. Furthermore, the transition towards a more knowledge-intensive economy will only be possible by increasing the level of education.

Early school leavers are at a higher risk of being unemployed, socially excluded, and of experiencing poverty. The situation in the EU is generally improving. The high levels of early school leavers in Eastern Europe and the Southern peripheral regions recorded previously have dropped, although rates remain high for Romania and Bulgaria. Rather surprisingly, in some economically successful regions in the Nordic countries and Western Europe the number of early school leavers has increased.

In general, urban areas perform better than their surrounding region. For example, Ireland shows major rural-urban differences. In contrast, some cities in Spain have had higher drop-out rates than their regions. In this case, a high proportion of young people left school during the economic boom years to enter the labour market when a significant number of low qualified jobs were created in construction, tourism and other service industries.

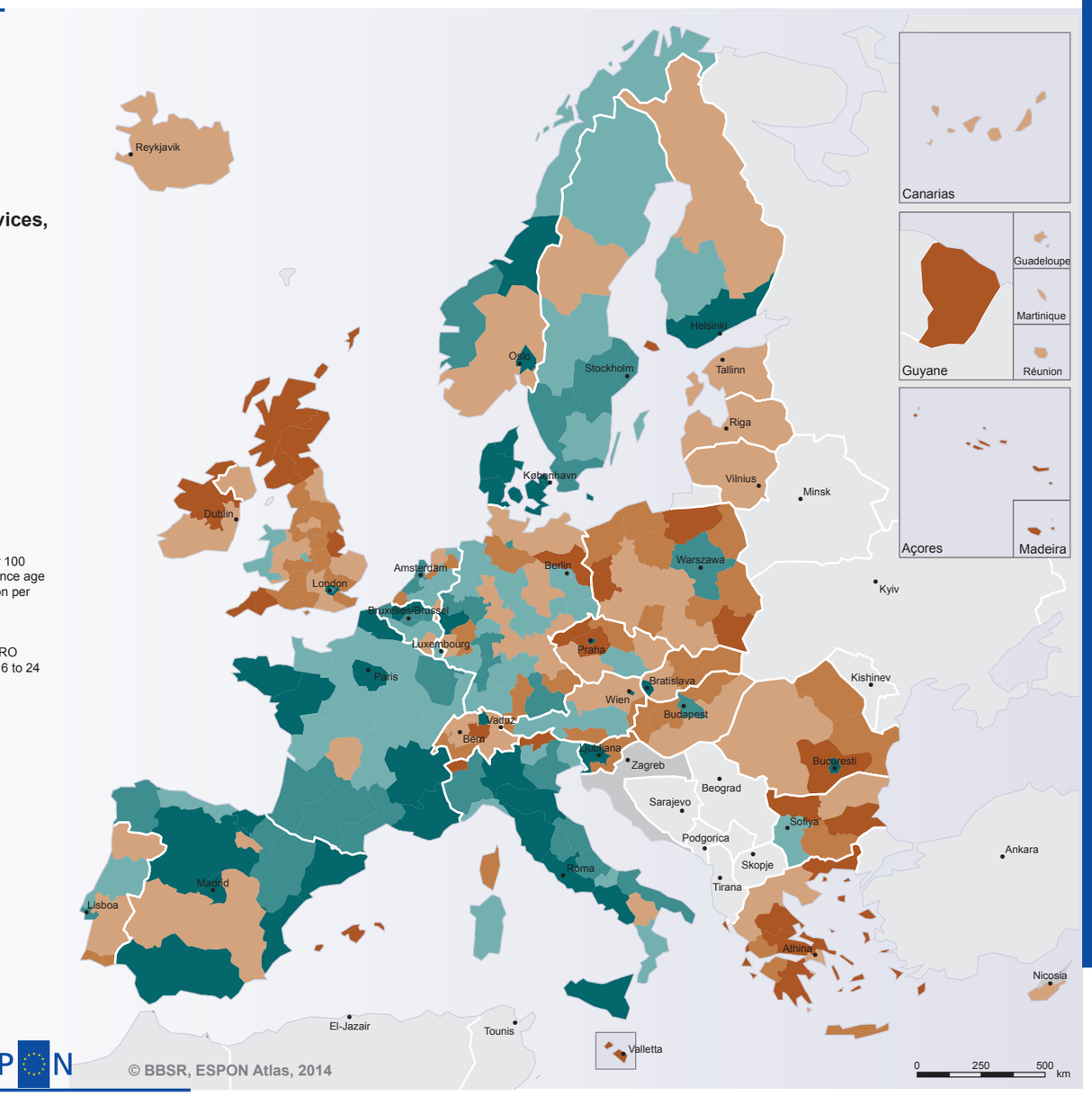
Statistics on early school leaving show that in all European countries there are more men than women leaving the education system earlier, with the exception of Bulgaria. Early school leaving is strongly linked to a low regional educational attainment.

The regions with a high share of persons with low educational attainment generally provide most of their employment opportunities in agriculture, tourism and construction. These regions in general also have low participation rates of adults in education and training. This double education gap - high numbers of early school leavers and low adult participation in education and training - constitutes a major territorial challenge.

Tertiary education covers not only universities, but also colleges, technical training institutes, nursing schools etc. The share of people participating in tertiary education in Europe is increasing. However, the US, Canada, Japan, Korea and Australia out-perform Europe in terms of participation rates. Some well performing European economies surprisingly have a low participation rate, which in some cases is linked to the countries' education systems (e.g. apprenticeships in Germany).

The Nordic countries as well as Italy, France and Spain perform the best in terms of the quality and attractiveness of their educational services. The quality and attractiveness of educational services is homogenous in most European countries. Capital regions are at an advantage, because of their higher rates in tertiary enrolment.

Educational services



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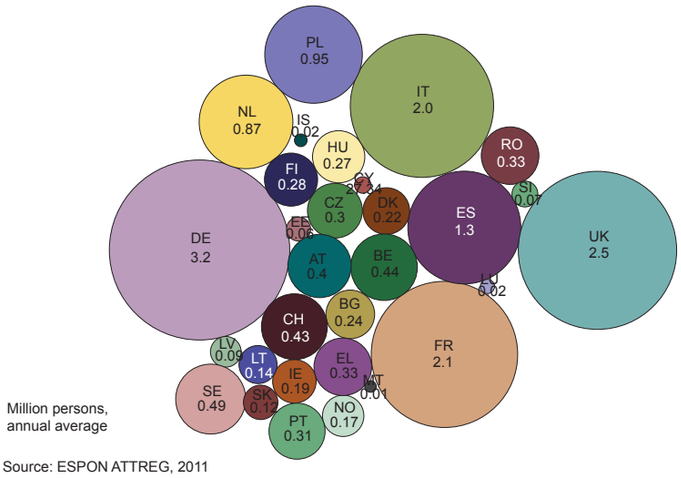
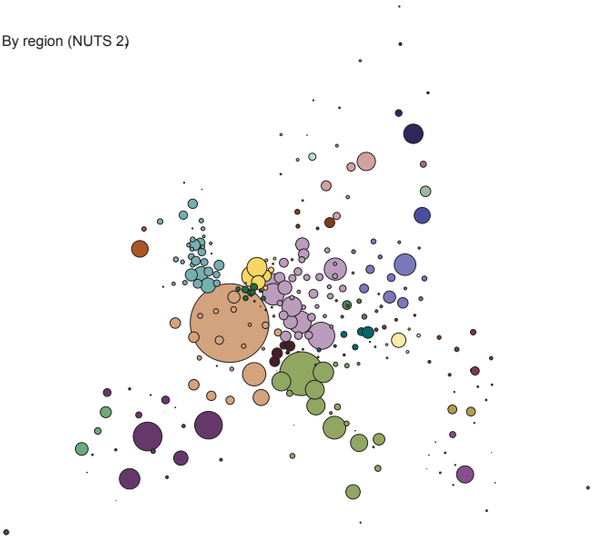
Creative workforce - employment in creative class

By country



Million persons, annual average

By region (NUTS 2)



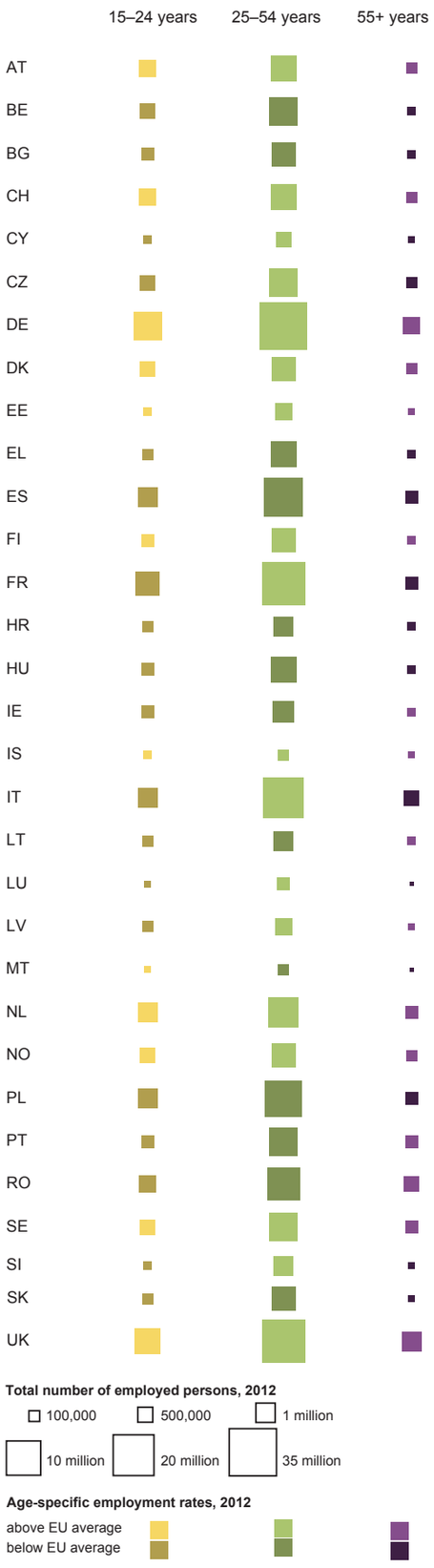
Source: ESPON ATTREG, 2011

Labour market

211 million persons

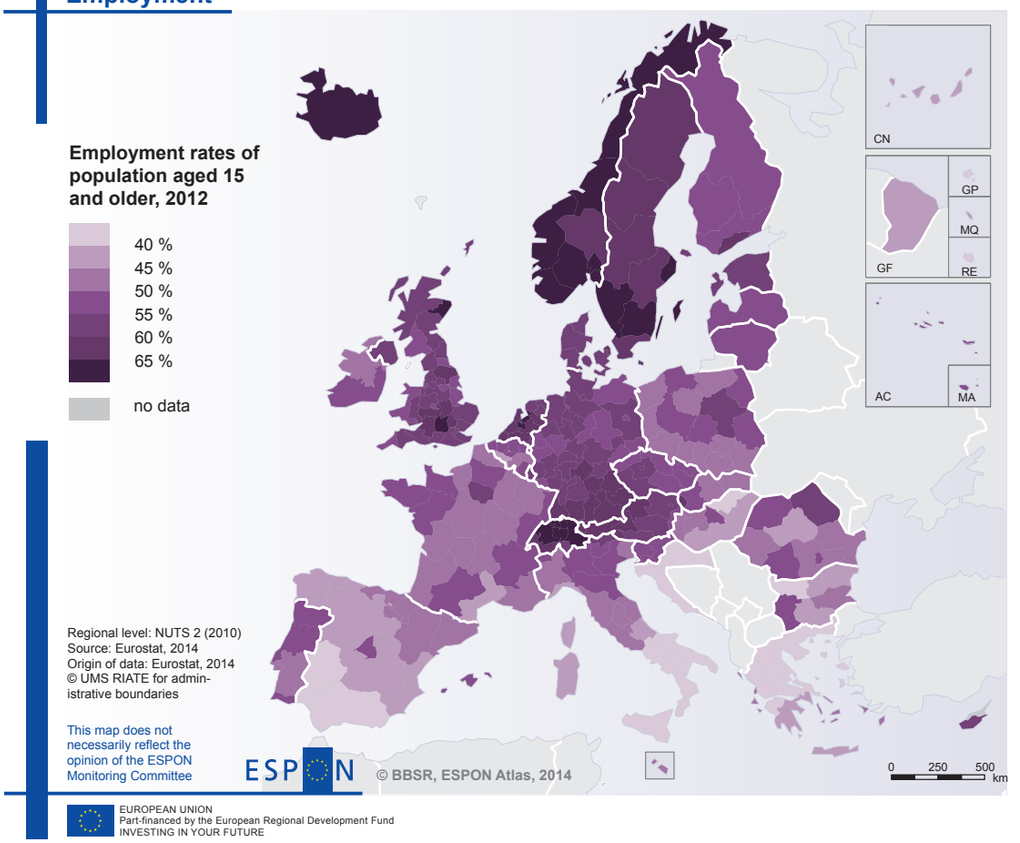
were employed in the EU in 2013.

Employed persons per age group



Source: Eurostat, 2014

Employment



The labour force comprises both the employed and the unemployed, actively job-seeking persons. It has grown considerably in Europe over the last 60 years. This increase was caused by a growing population and rising participation in the labour market, especially amongst women.

The economic crisis that has affected Europe since 2007 has had a severe impact on the European labour market. The effects were asymmetric in countries and regions in Europe. Employment was affected severely. Between 2007 and 2011, Lithuania, Estonia, Latvia, Ireland, Greece and Spain suffered most. Construction and manufacturing were the sectors where the labour market was most severely hit by the recession.

Over the last few years, however, unemployment rates declined in the majority of regions. This occurred in regions with an already lower level of unemployment. Existing disparities in unemployment however got worse both at a European level and in most of the Member States. However, there are recent signs that as national economies are picking up, the level of unemployment is beginning to decrease in some countries.

The employment rates for women are lower than for men, both at a European and at a regional level. However, the gap between men and women is narrowing. The employment rates for men were more affected by the crisis compared to female employment. During the crisis, female employment decreased to a lesser extent or even rose slightly. Overall unemployment rates increased as a result of the economic crisis, as did youth unemployment.

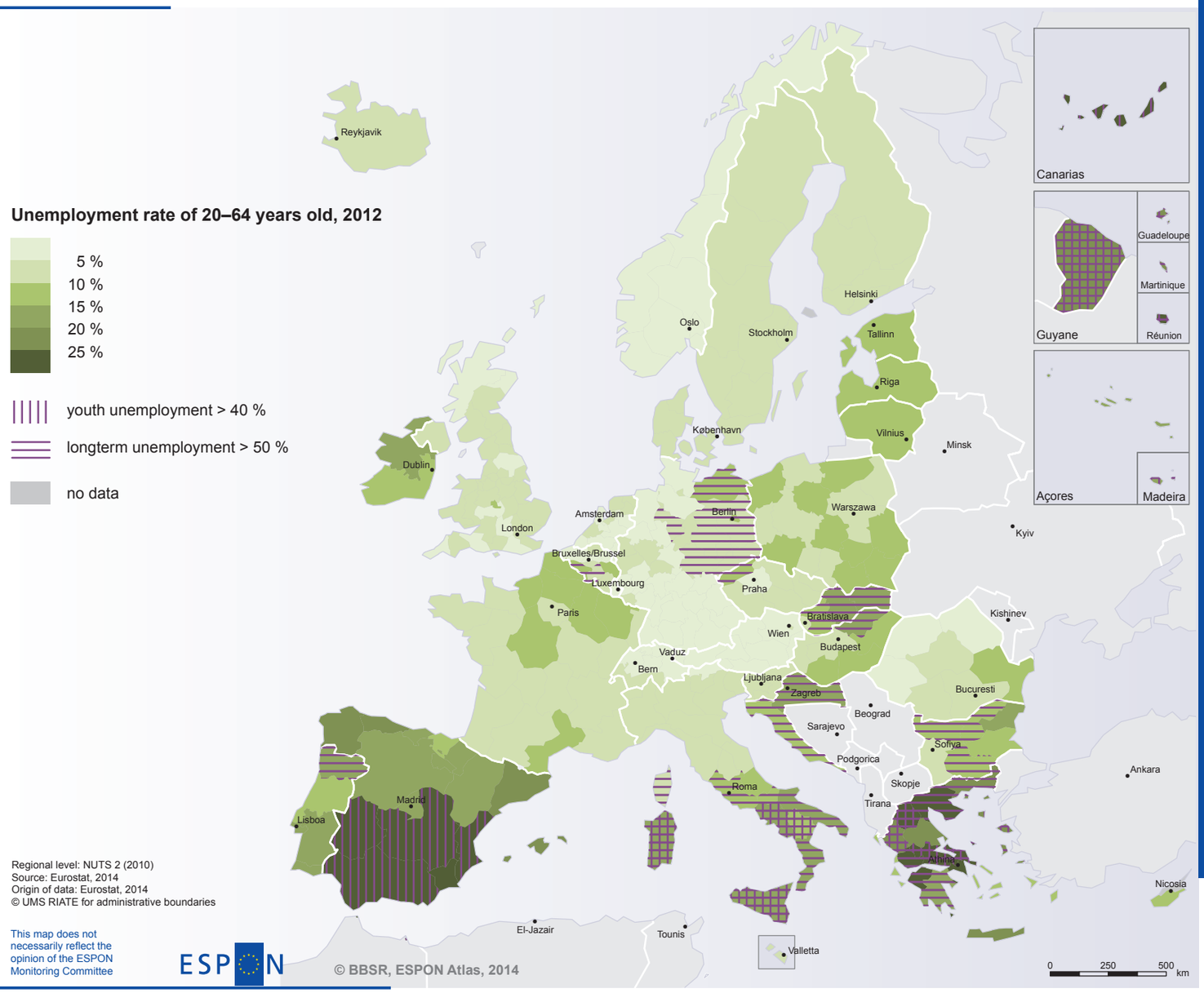
Since 2000, the unemployment rate at EU level had been dropping from about 9% to 7% in 2007 and 2008, but then rose to 10.9% in 2013. In the most affected countries, unemployment rates even doubled or tripled over this period.

The gender gap narrowed not only in terms of employment, but also in terms of unemployment rates. This was mainly due to the fact that men were more affected by the crisis. In 2012, female unemployment rates for the ESPON countries were therefore only slightly higher than male. However, the data show a strong national and regional differentiation. In a number of regions in Southern, but also in Eastern Europe the unemployment rates for women are more pronounced. However, there is a considerable number of regions where there is an unfavourable relative imbalance for men's unemployment.

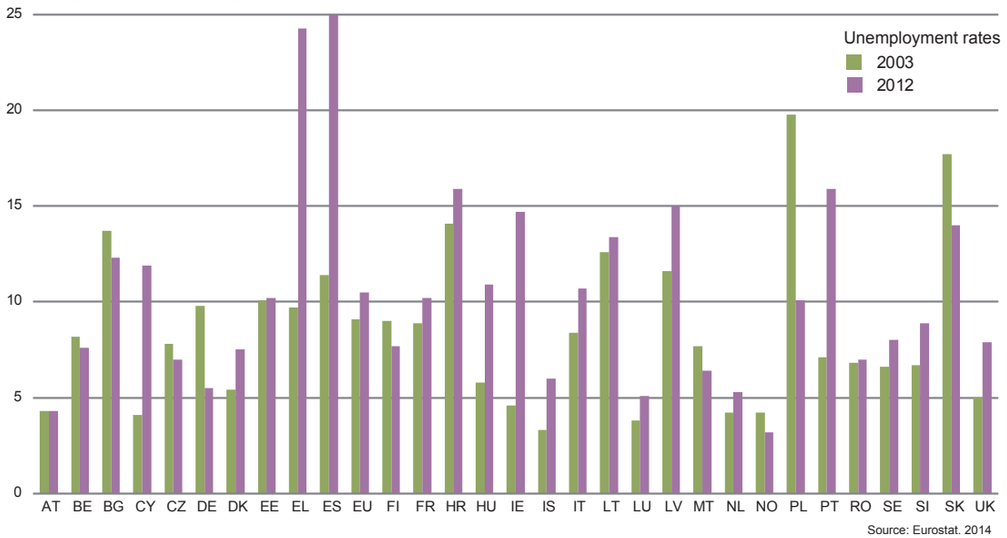
Young people have a higher risk to be unemployed, even when economic conditions are favourable. As a result of the economic crisis, unemployment among young people rose even higher than the overall unemployment. In one fifth of the NUTS 2 regions, one out of three economically active young people were unemployed; in 4% of the regions, mostly in Spain and Greece, it was even one in two. In most EU countries, youth unemployment rose higher than overall unemployment.

At European level, long-term unemployment (unemployment of more than 12 months) rose only slightly between 2003 and 2012, but Greece and Spain experienced a dramatic increase compared to the EU average.

Unemployment

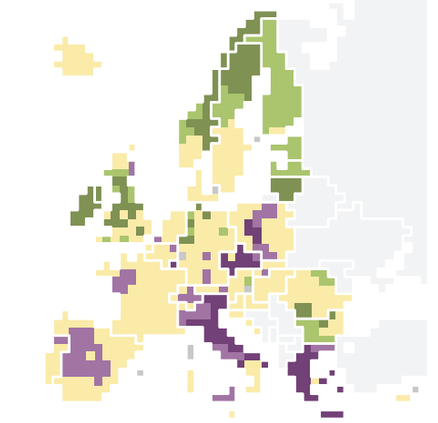


Change in unemployment



Source: Eurostat. 2014

Gender imbalances in unemployment



Relation of unemployment rates, average 2010–2012

Rates higher for men: very much, much
Rates higher for women: much, very much
no data

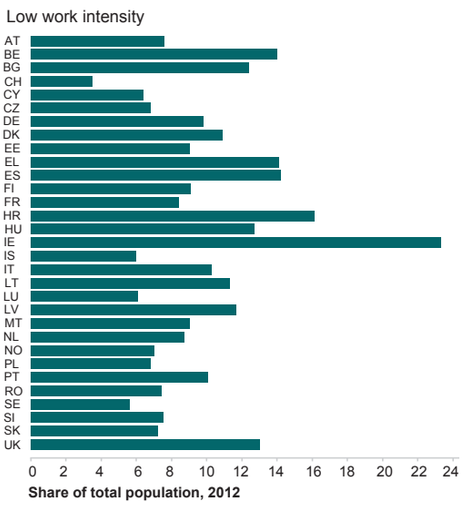
Source: based on Eurostat. 2014

Poverty and social exclusion

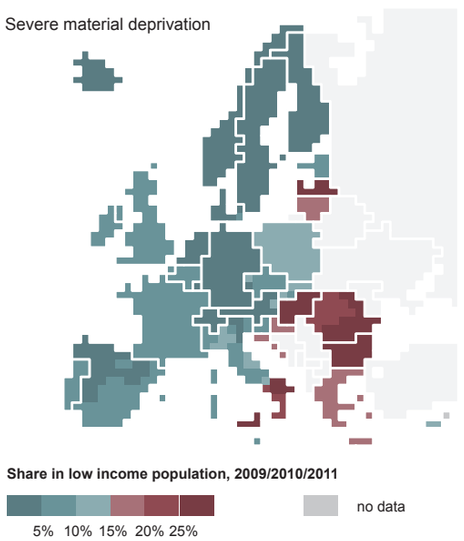
124.2 **million people**

were at risk of poverty or social exclusion in the European Union in 2012 – 24.8% of the population.

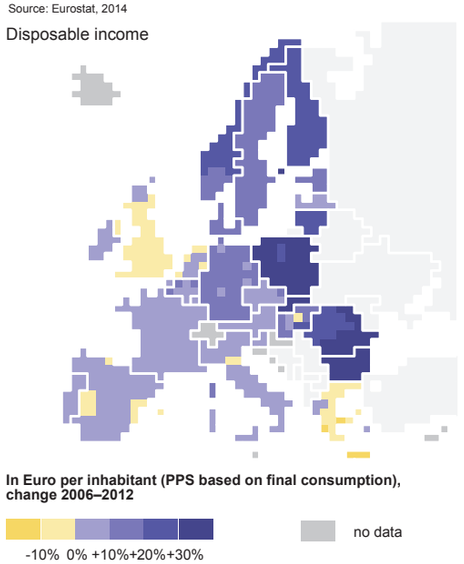
Poverty indicators



Source: Eurostat, 2014

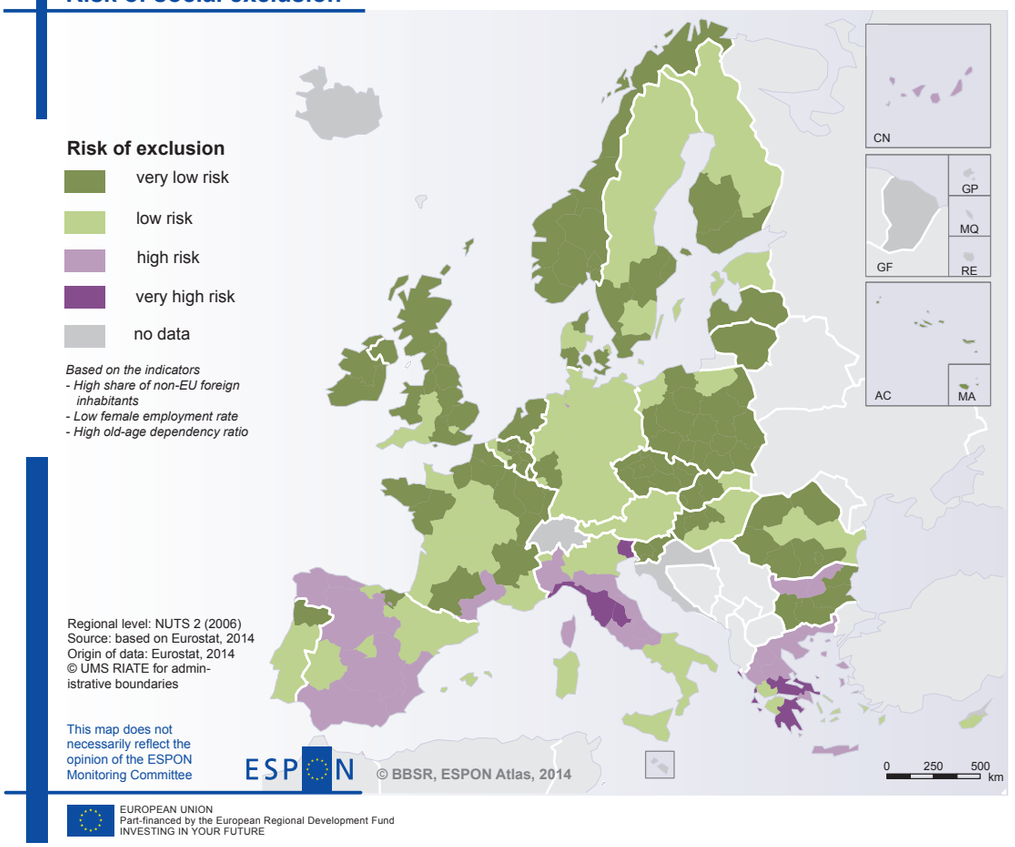


Source: Eurostat, 2014



Source: Eurostat, 2014

Risk of social exclusion



One of the aims of the EU2020 Strategy is 'inclusive growth'. By setting this aim, the European Union wants to ensure that the benefits of economic growth spread to all levels of society in all Member States. Even before the economic crisis, there were 80 million people at risk of poverty, including 19 million children. The crisis saw an increase in poverty and social exclusion in two-thirds of Member States.

Poverty and social exclusion are influenced by an individual's abilities to earn a living, have access to services, the social environment and the opportunities available to the individual to engage in political participation.

Statistically, there is an urban-rural divide in those regions where segments of the population are at risk of poverty and social exclusion. In particular, in the East European Countries, the population in rural areas is at a greater risk of poverty and social exclusion compared to those living in urban areas. In contrast, in the other Member States there are other segments of the population who are at a higher risk of poverty and social exclusion.

However, rurality and remoteness are not automatically an indicator for poverty and social exclusion. Rurality and remoteness become risk factors when they overlap with other risk factors, such as poor accessibility, structural economic problems, sparse and scattered population, ageing and a shrinking population. Furthermore, the EU is facing common challenges regarding vulnerable groups, such as the Roma who have been excluded from society.

There is a strong interrelation between poverty, social exclusion and health status. Furthermore, there is a close relationship between educational achievements, poverty and social exclusion. In particular, in rural and remote areas, there is a strong connection between poverty, social exclusion and old age which lead to increasing levels of social isolation amogst the elderly.

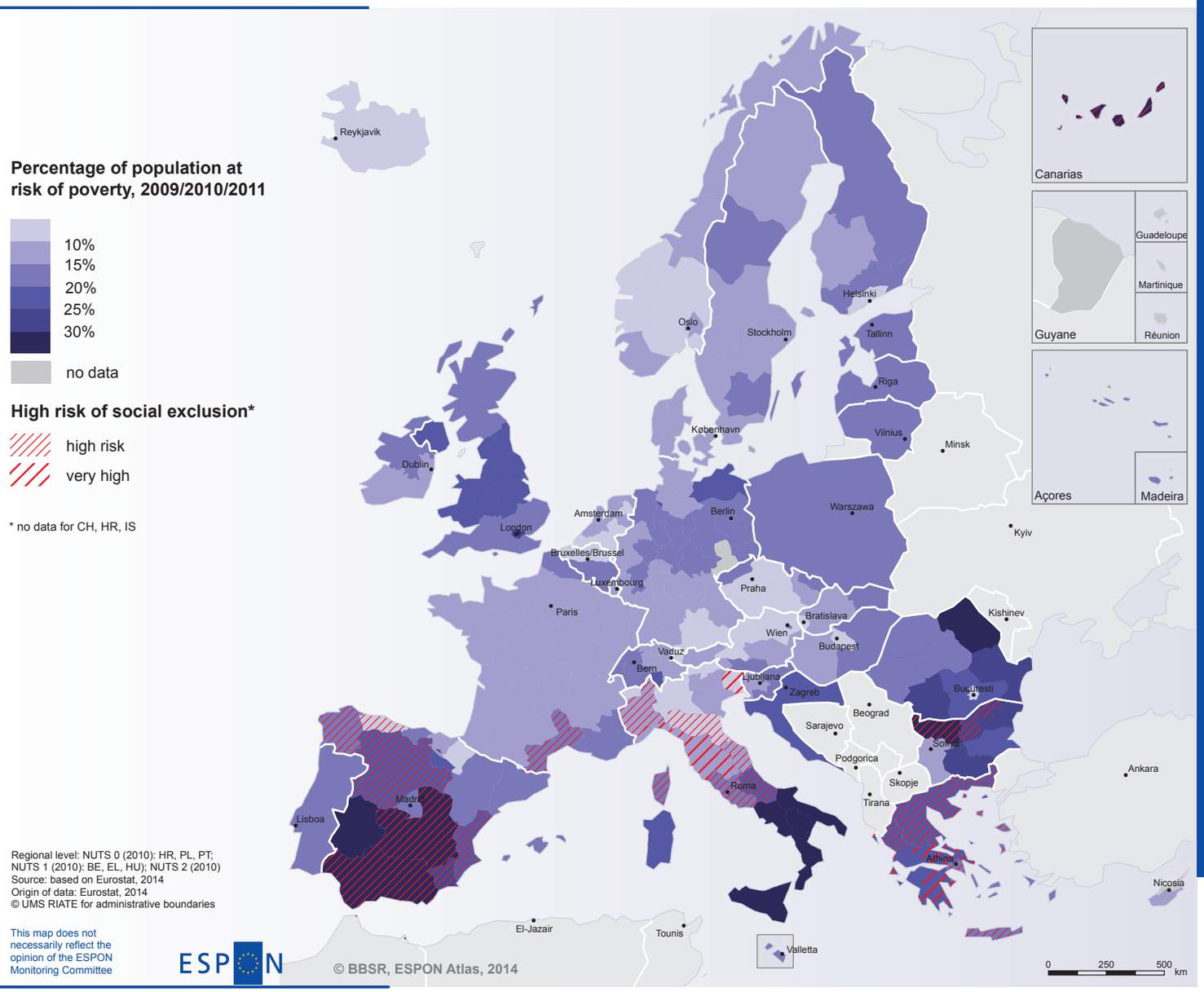
Social exclusion is more prominent at a local and often very small-scale level. The main underlying factors which influence this are often outside the local sphere of influence, such as access to labour market or social protection schemes.

In Europe, five main clusters of inclusion can be indentified. The cluster 'Inclusive Centre' shows relatively positive (inclusive) performance across all aspects of poverty and social exclusion.

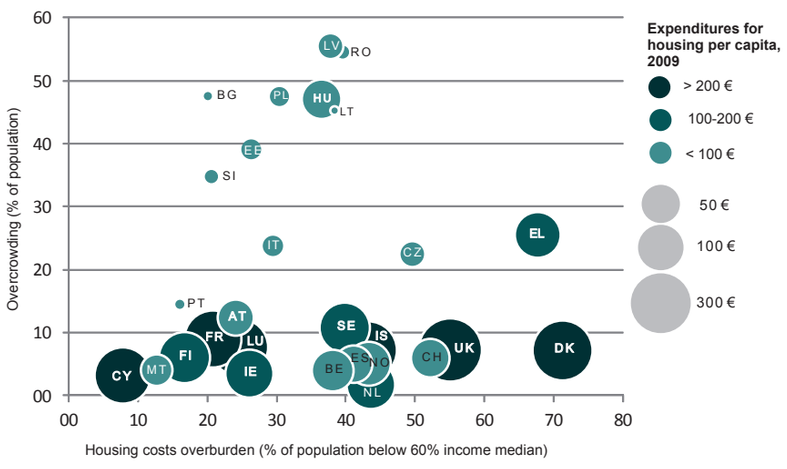
The cluster 'Competitive North-West' performs particularly strongly in relation to labour market characteristics, but has a higher share of foreign born population and a larger number of single parents. The cluster 'Emerging East' is characterised by higher material deprivation, low life expectancy and poor housing conditions, combined with moderate labour market and education indicators.

The cluster 'Mediterranean Adjustment' is distinctive for its relatively high rates of poverty, relatively poor labour market conditions and ageing population. Romania is an outlier in terms of poverty, labour market conditions, material deprivation housing, and education indicators.

Risk of poverty and social exclusion

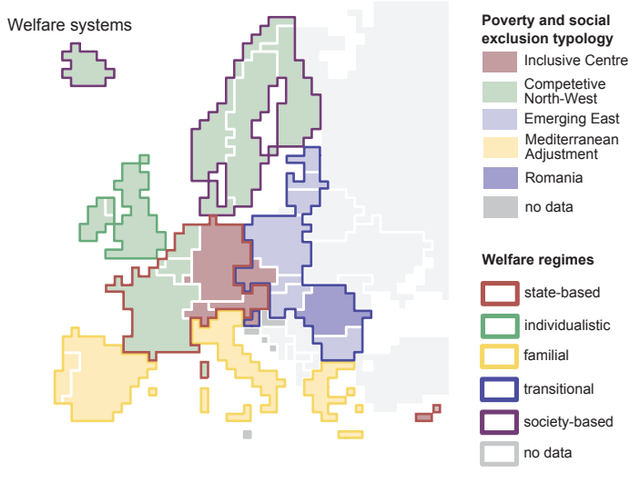


Housing indicators



Source: ESPON SeGI, 2012; Eurostat, 2014

Typology of poverty and social exclusion



Source: ESPON TiPSE, 2014

Social cohesion – territorial synopsis

The main overall demographic trends across Europe are the decline in population growth, the ageing of the population, the shift from births to immigration as main source of population growth and the reduction in the growth rate of the working-age population. These general trends, however, show significant differences at a regional level. They do not only affect demography, but have a strong impact on labour markets as well.

If the extent and direction of migration flows and reproductive behaviour do not change, the size of the working-age population will decline in the next decades, while at the same time the share of old-age population will increase.

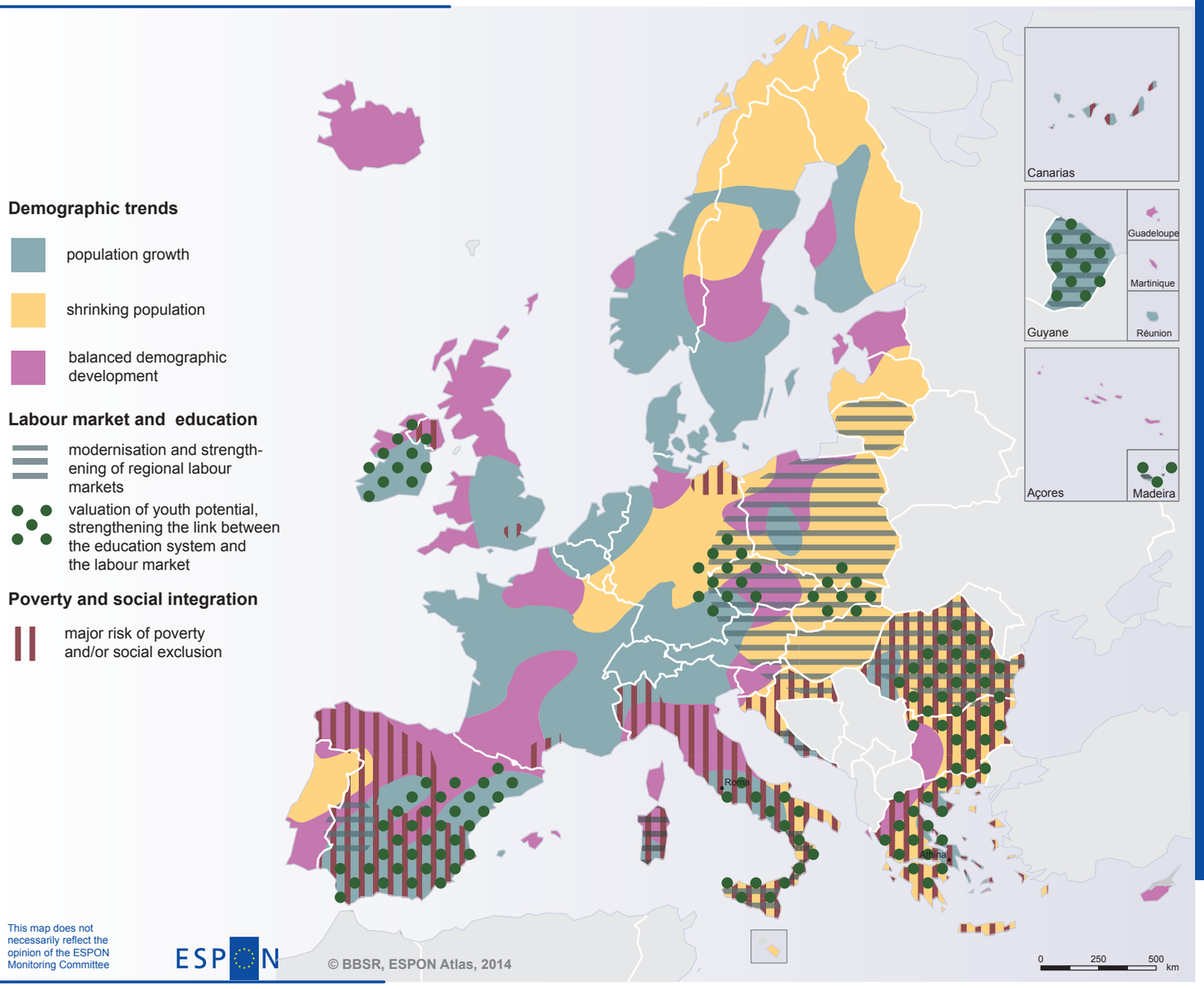
This will be a challenge for European competitiveness since the working-age population in many other parts of the world is expected to continue to grow in the foreseeable future. In addition, social and economic disparities across European regions may increase.

Growing regions will have to ensure that a balanced population development is maintained.

Regions with shrinking population need to direct their activities towards measures attracting and retaining younger people as well as redressing the outflows of population. Where the educational level is too low, the quality of the overall education should be boosted and life-long learning should be encouraged.

Balanced regions will have to work towards retaining favourable trends; they should ensure that potential intra-regional or urban-rural disparities do not become a problem.

Society and integration – territorial synopsis



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IV. Economic structures and global challenges

In a globalised world, Europe is facing a situation in which from a long-term perspective its Gross Domestic Product (GDP) is increasing, but its share of the world economy is decreasing due to strong emerging economies such as China, India or Brazil. As such, economic performance is a major issue for strategic policy development for Europe and for its cities and regions.

In 2000, the European Union has set in its Lisbon Agenda the strategic goal 'of becoming the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion'. Although the original goals set for 2010 were not fully met, and the global economic downturn which started in 2007 played its part, the objectives of the Lisbon Strategy remain important for Europe and its regions.

The Europe 2020 Strategy adopted by the European Council in 2010 sets out a vision for Europe's economy for the 21st century. The strategy builds on the Lisbon Agenda, but is based on a broader set of priorities and objectives. The priorities tackle different growth aspects:

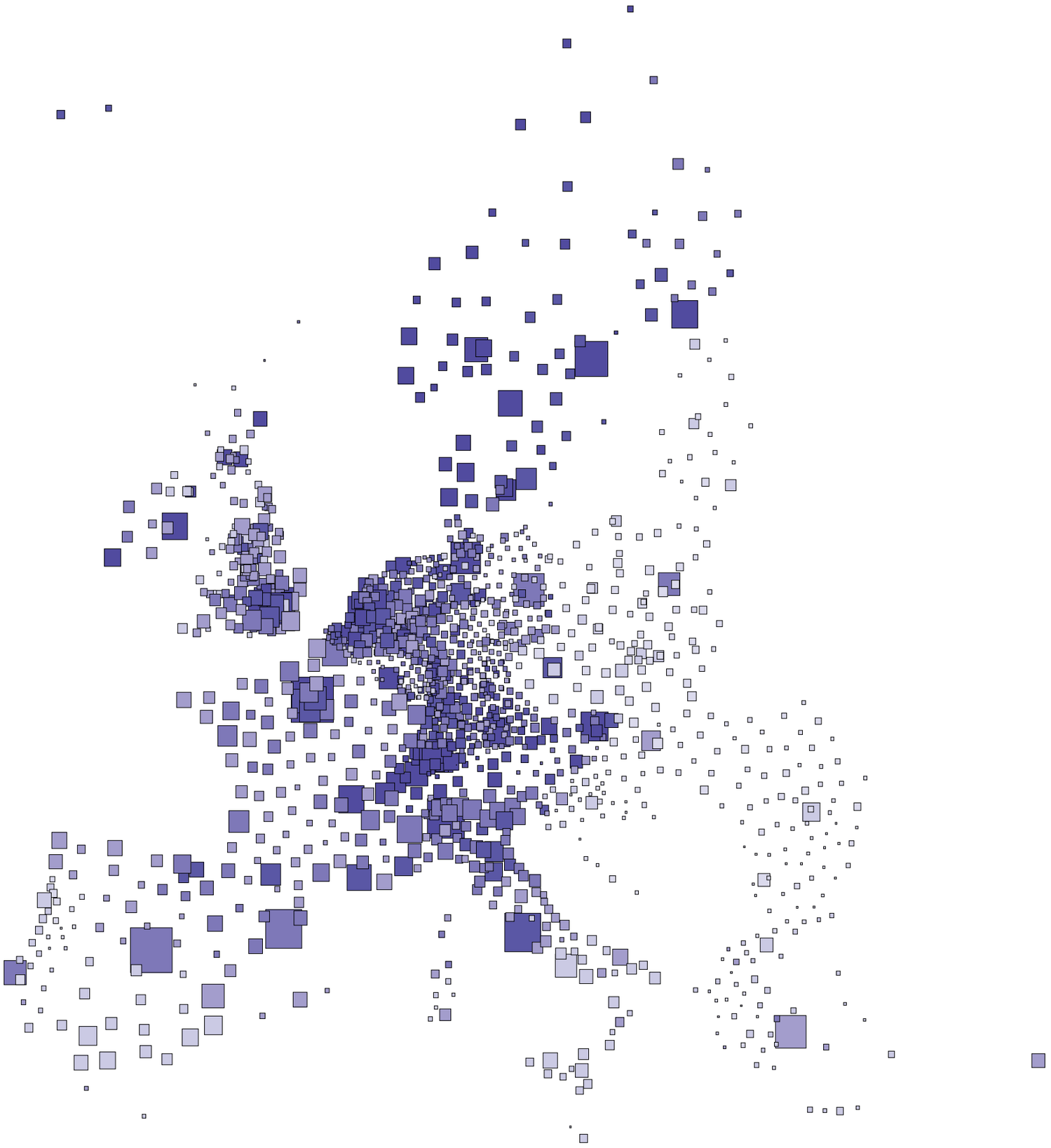
- Smart Growth: developing an economy based on knowledge and innovation;
- Sustainable Growth: promoting a more resource efficient, greener and more competitive economy;
- Inclusive Growth: fostering a high-employment economy delivering social and territorial cohesion.

The Europe 2020 Strategy as such is not territorial. The development of territorial thinking and approaches is taken up in the Territorial Agendas of the European Union, the first decided by the Ministers responsible from all EU Member States in 2007. The Territorial Agenda 2020 adopted in 2011 states 'that the objectives of the EU defined in the Europe 2020 Strategy for smart, sustainable and inclusive growth can only be achieved if the territorial dimension of the strategy is taken into account, as the development opportunities of the different regions vary'. Six territorial priorities to contribute to the successful implementation of the Europe 2020 Strategy were defined. One of the priorities is to ensure global competitiveness of regions based on strong local economies.

The Fifth Report on Economic, Social and Territorial Cohesion provides evidence that regional disparities in the European Union are decreasing. But it states also that more developed regions are more competitive and that innovation is one of the major reasons for this. The Sixth Report on Economic, Social and Territorial Cohesion states that the crisis suspended the reduction in regional disparities, but also shows how Cohesion Policy has evolved to strengthen its impact on EU objectives of growth and jobs. The Seventh Progress Report on Economic, Social and Territorial Cohesion assesses how regions and cities can contribute to smart, sustainable and inclusive growth and the Europe 2020 headline targets in the context of cohesion policies. The report shows that cities and regions are faced with different combinations of development challenges and growth potentials. This is one of the main reasons cohesion policy uses an integrated approach that can be adjusted to local needs and opportunities. The Eighth Progress Report on Economic, Social and Territorial Cohesion highlights the crisis-induced changes that will affect the context and priorities of the new programmes financed by the European Structural and Investment Funds.

The policy documents mostly have an explicit or sometimes implicit territorial dimension, where the diversity of dynamics and potentials of each region and city will define their contribution. Subsequently, monitoring of the territorial aspects related to the strategic goals is as essential as ever.

Regional Gross Domestic Product (GDP)



Regional level: NUTS 3 (2010)
Origin of data: Eurostat, 2014

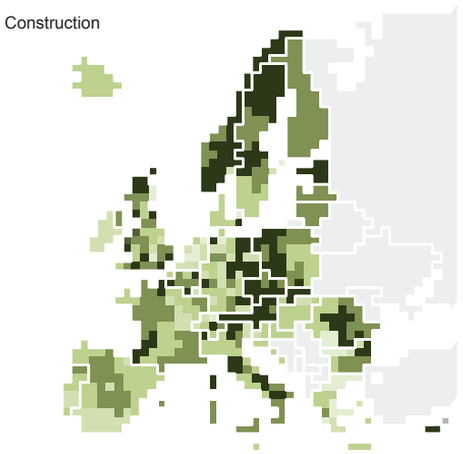
Regional economic structure

21.2 %

of EU's motor vehicles are produced in 2013 in the Eastern Member States. Ten years earlier, the share was only 7.5 percent.

Employees in sectors

Construction

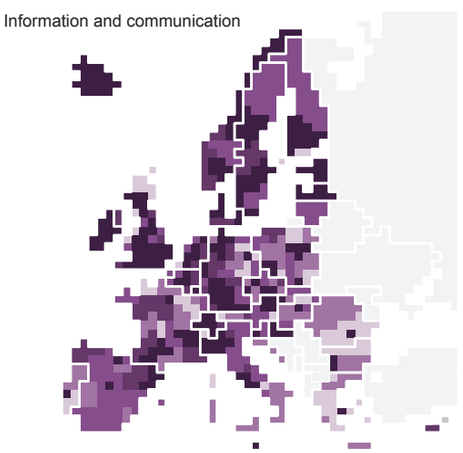


% of total employment, 2013

5 6 7 8

no data

Information and communication

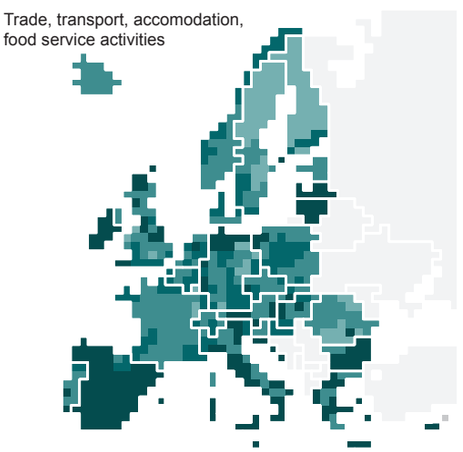


% of total employment, 2013

10 20 30 40

no data

Trade, transport, accomodation, food service activities



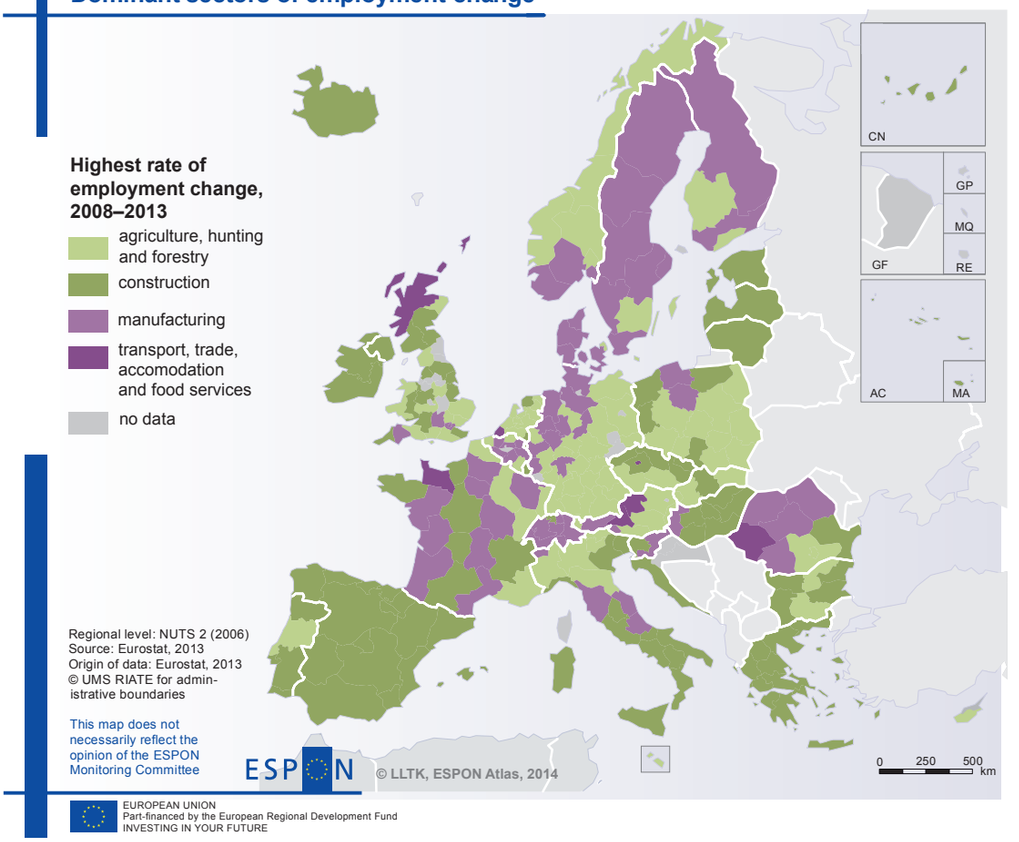
% of total employment, 2013

19 21 23 25

no data

Source: Eurostat, 2013

Dominant sectors of employment change



Europe is on the path to steady recovery, leaving the worst years of the recent economic crisis behind. The negative consequences of the economic crisis led decision makers to analyse and revise the economic and sectoral structure of their country. This process influenced economic development in all European countries which has led to major changes in the structure of the national and regional economies.

Progress in technology, innovation and skills enabled economies to produce the same products at higher levels of productivity, and to develop new goods and services. On the other hand, regional agriculture has followed a downward trend, while manufacturing has displayed a steady upturn pattern. Services are increasing in almost all industrialised countries.

Despite its decline in the EU's share of GDP, manufacturing is regarded as the engine of the modern economy in most of the European countries. The relative decline of industrial output was counterbalanced by a rapid expansion of the services sector.

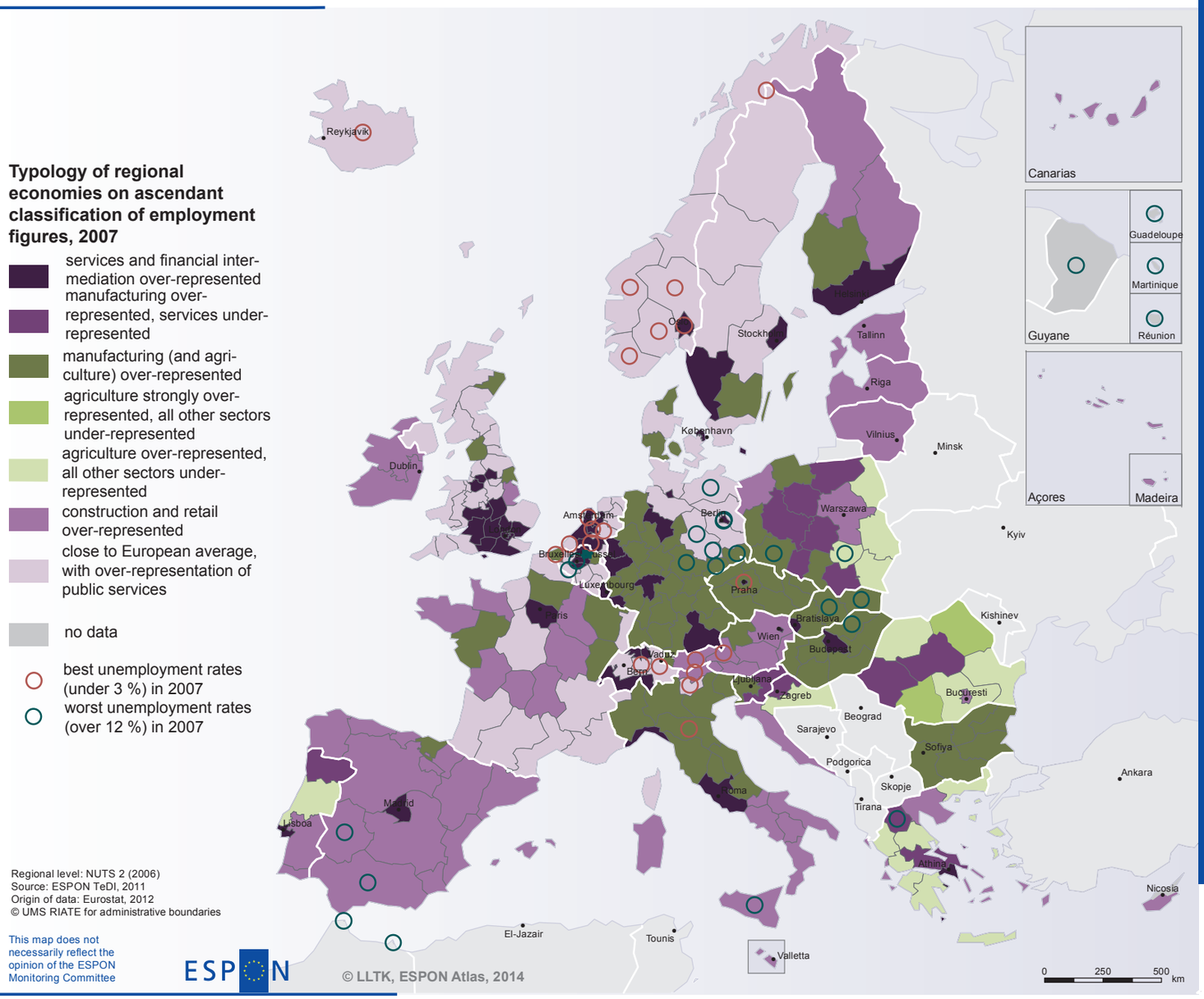
While experiencing varying country-specific restructuring patterns, there are common features in most of the EU countries. For example, the shares of agricultural and manufacturing output have decreased, whereas those of real estate, renting and business activities, information and communication, financial and insurance services, as well as public administration have increased. However, it must be highlighted that patterns of structural change were quite different across individual countries, and also differed in terms of pace.

Structural change is not only related to changes in the composition of economies. The growth potential of economies is also affected by the sectoral composition of output and employment. Some sectors experience higher long-term growth than others, leading to shifts in their share of the economy. However, it is important to note that the structure of the economy can also change without any positive influence on economic growth.

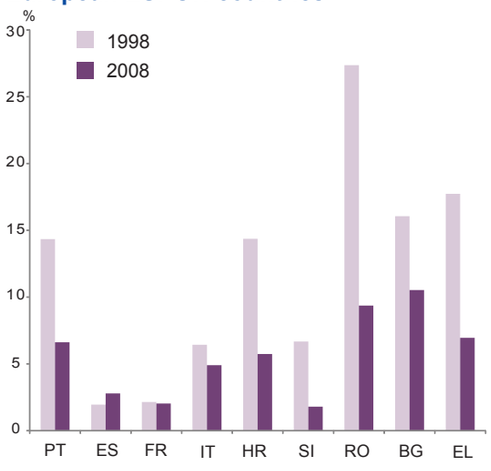
European cities have an increasing share of high level services such as finance, business services and real estate. They also have a high share of manufacturing industry, including energy and construction. High level services are clearly more present in the large and rich metropolitan areas of Western Europe. The highest level is to be found in four of the major world financial cities which are in Europe: London, Paris, Frankfurt and Zurich.

The share of industry has a much more complex geographic pattern. The lowest percentages are to be found in the big financial and business centres of Europe. Although we cannot ignore the fact that even in the richest cities in Germany and Northern Italy, and also in some Scandinavian cities, the manufacturing industry continues to play an important role. By contrast, most of Mediterranean cities, with relatively low GDP per inhabitant have a low share of manufacturing. In Eastern Europe, some small and medium size cities have the highest share of industry while the most developed capital regions have already gone through a deindustrialization process.

Typology of regional economies

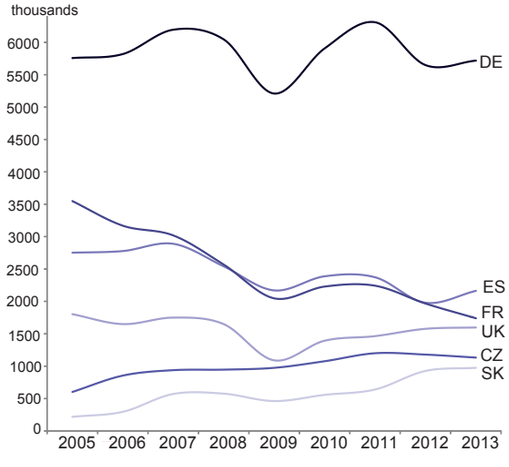


Share of clothing in export in Southern European ESPON countries



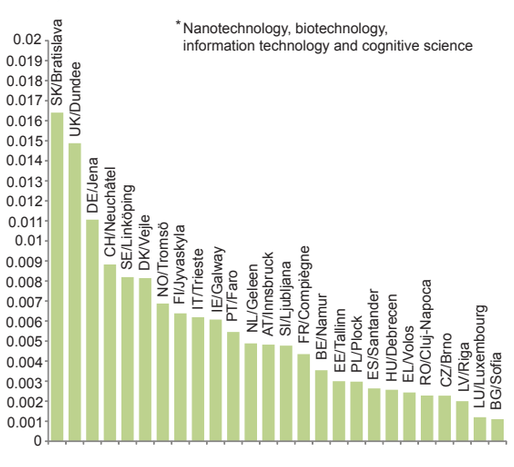
Source: ESPON TIGER, 2011

Production of motor vehicles in selected countries, 2005–2013



Source: ESPON TIGER, 2011

NBIC* specialization index of the best FUA, 2006



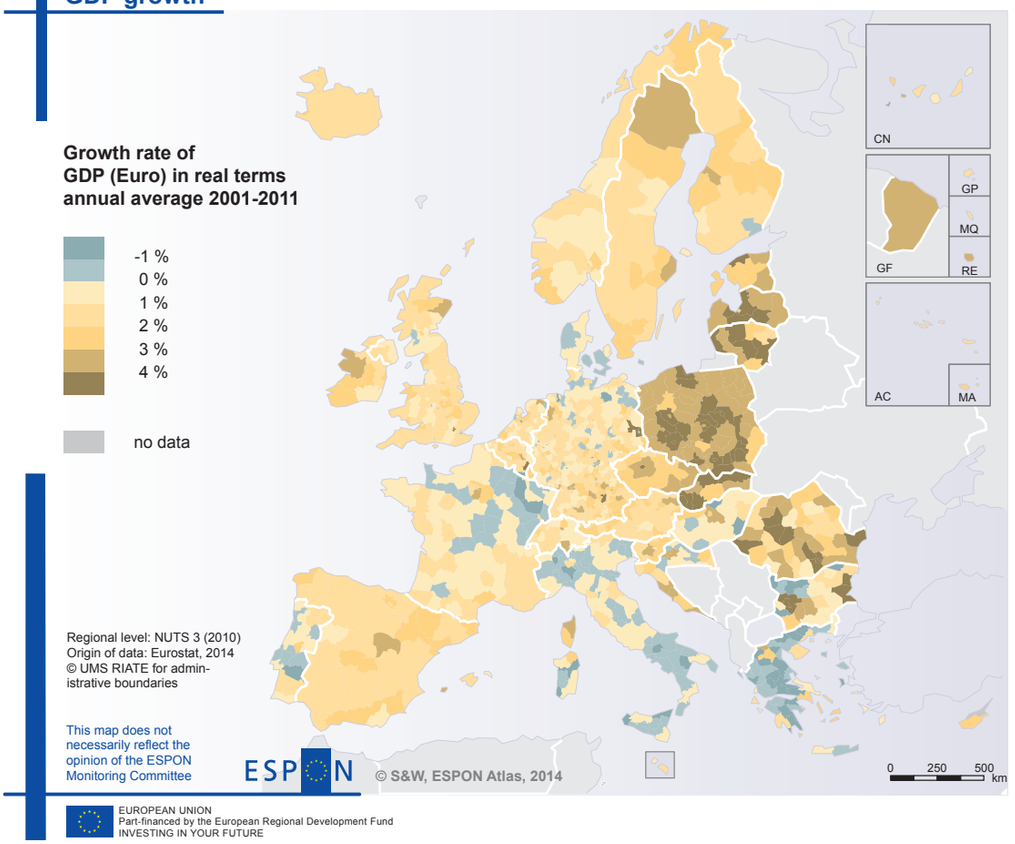
Source: ESPON SIESTA, 2013

Regional economic performance

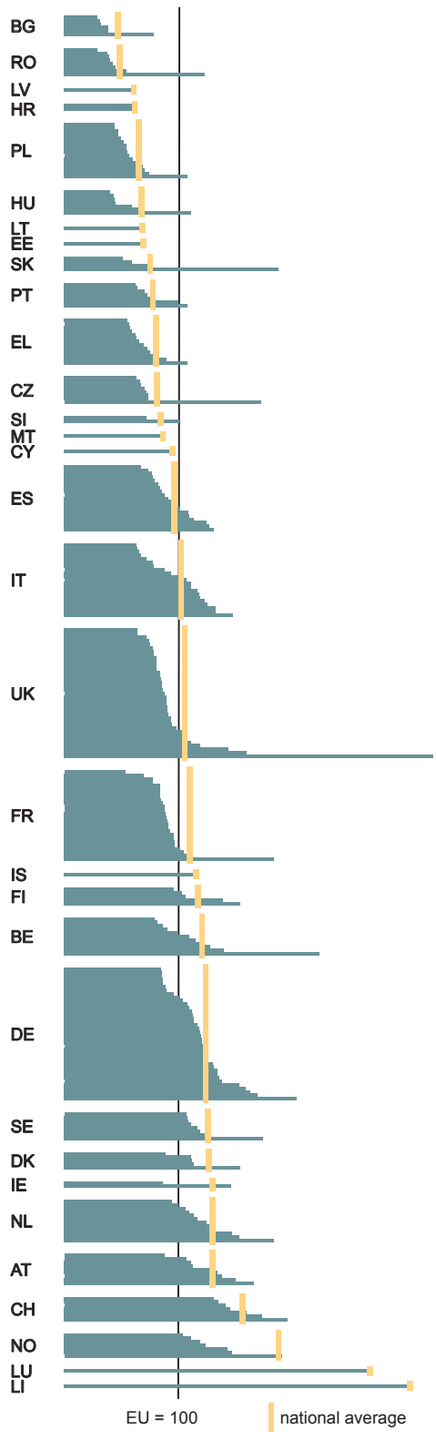
26,190 Euro

was the average GDP per inhabitant of the ESPON countries in the year 2011.

GDP growth



GDP per capita



GDP per capita in Purchasing Power Standard, 2011
Regional level: NUTS 2 (2010)
Source: Eurostat, 2014

The standard indicator to measure economic performance is Gross Domestic Product (GDP). GDP reflects the market value of all final goods and services produced within an area in a given time. To reflect the different price levels in different countries, GDP is often converted into Purchasing Power Standard (PPS).

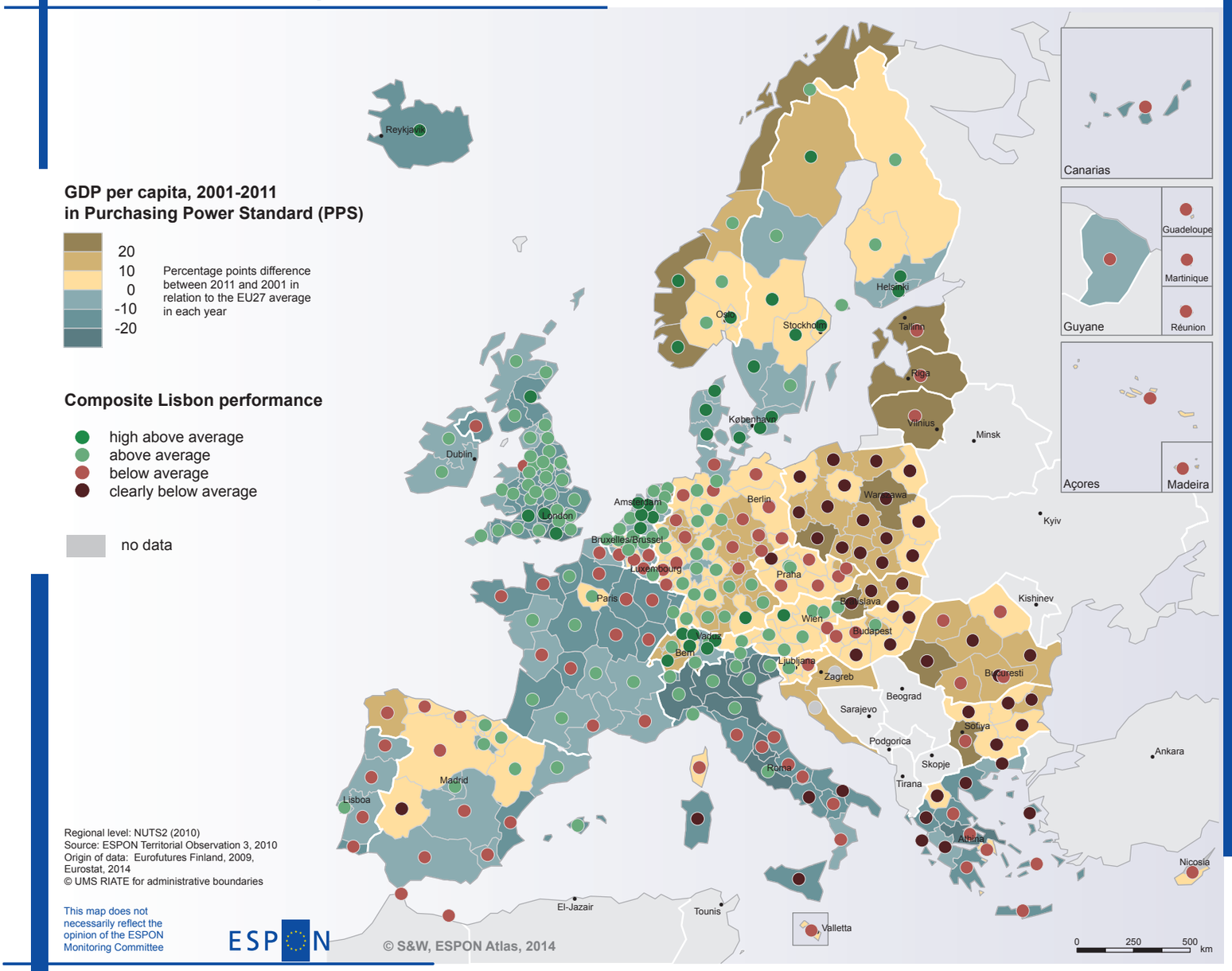
Economic performance between countries and between regions differs very much in terms of GDP per capita. At the national level the variation is between less than 50 percent of the EU27 average GDP per capita in Bulgaria and Romania and more than 150 percent of the average in Switzerland and Norway. Remarkable differences do exist within nearly all countries. In many cases this difference is due to the gap between rural regions and the good performing capital regions, a phenomenon that is most striking in several East European countries (e.g. Bulgaria, Romania). In almost all countries in Western Europe, there are regions that are clearly underperforming. All regions of the four non-EU countries participating in ESPON have higher GDP per inhabitant than the EU27 average.

The recent economic crisis has had a tremendous impact on long-term real GDP growth. Over a period of ten years, most regions in Greece, several regions in Italy, France and Portugal, and some in Germany, Denmark, Hungary and Bulgaria had a reduction in economic output due to losses in the last years. However, annual average real GDP growth rates in other regions were clearly positive. Most remarkable are many regions in EU12 that had an average real GDP increase per year of more than 3 percent during that decade. In most countries there are profound differences of several percentage points yearly.

In consequence, regions moved their relative position compared to the EU average of GDP per capita. Most remarkable gains of more than 20 percentage points occurred despite the negative effects of the crisis in the Baltic States and in a few other regions in Eastern Europe. In general, all regions of EU12 improved their relative position. Western Europe has two very different types of regions, relative winners and relative losers.

A composite benchmark index developed in the ESPON Programme includes 7 of the 14 so-called Lisbon indicators covering the five areas of employment, innovation and research, economic reform, social cohesion, the environment as well as general economic background. The Lisbon performance index shows the capability of individual European regions in improving their economic competitiveness related to the objectives. Europe clearly has regions that are better equipped than others in terms of economic Lisbon performance, which also have different potentials. High performing regions have a much higher share of total European GDP than their population share. However, the lowest Lisbon performing regions are catching up with the highest growth rates regardless of their low performance. Higher performing regions are divided in two groups: one group is maintaining its position, and a second group which is slightly losing ground. Stimulating improvements in the competitiveness of underperforming regions and places may support a better balanced territory at regional, national and/or European scale.

Lisbon performance and regional economic development



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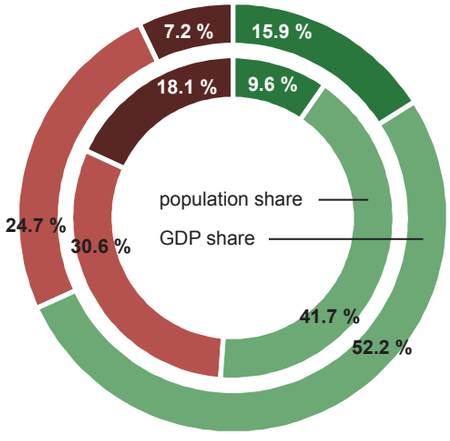
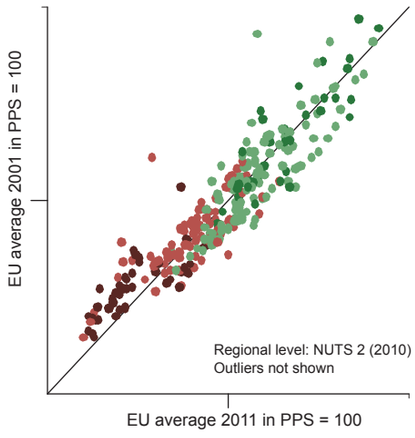
GDP and population by composite Lisbon performance



Composite Lisbon performance

- high above average
- above average
- below average
- clearly below average

Regional GDP per capita and composite Lisbon performance



Source: ESPON Territorial Observation 3, 2010
Origin of data: Eurofutures Finland, 2009, Eurostat, 2014

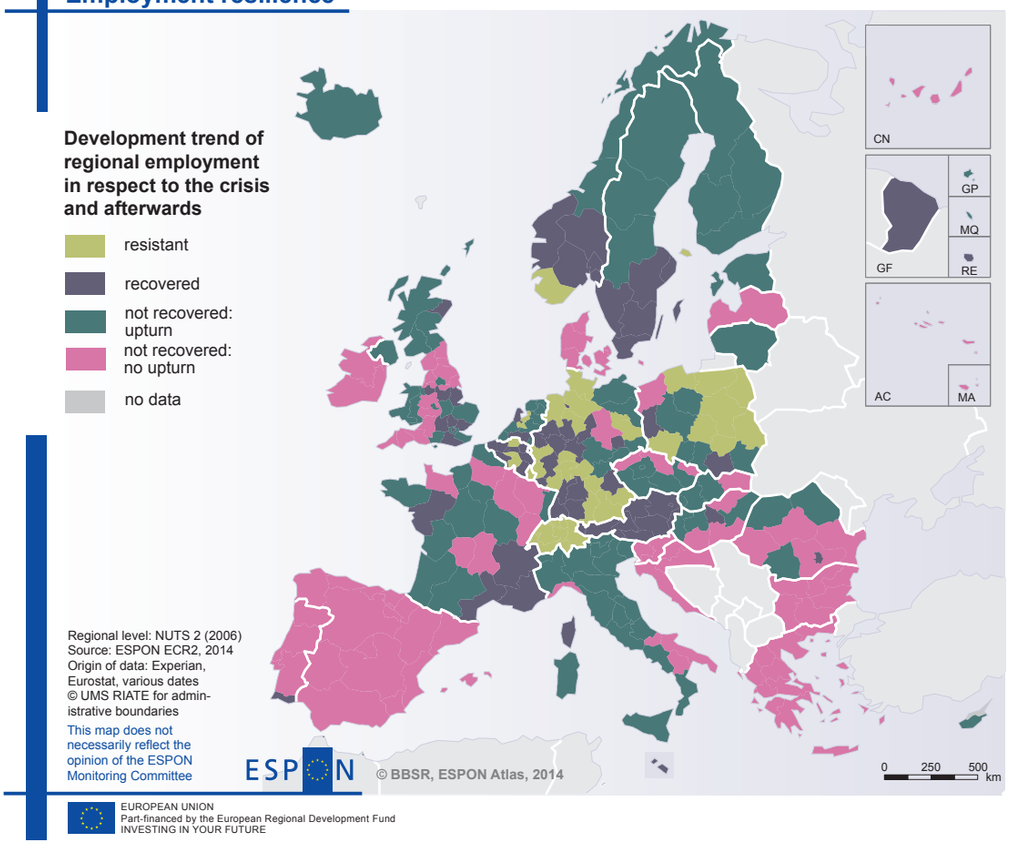
Regional dimension of the economic crisis

The GDP of the ESPON countries declined in 2009 compared to 2008 by

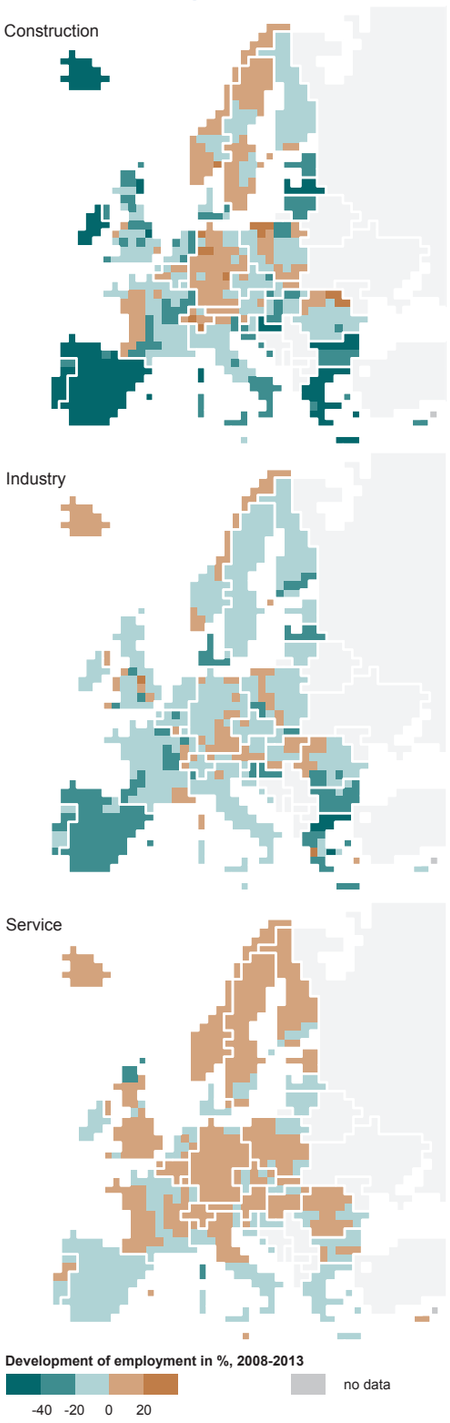
774 **billion PPS,**

the economic power of the Czech Republic and the Netherlands together.

Employment resilience



Development of employment by economic activity



In the wake of the recent economic crisis, the European Union has witnessed the most severe economic downturn in its history. However, not all regions experienced economic decline. Growth rates at the beginning of the economic recovery vary greatly. Some of the European regions are already on their way out of the crisis, but many regions are not in a stable economic situation yet.

The impact of the crisis on employment has been significant. Between 2008 and 2009, the number of people in employment decreased by 3.6 million, followed by another 1.4 million people who were out of work in 2010.

In the regions which were hit the most and which have not recovered yet compared to 2008, the loss of jobs affected 6.1 million people in 2009 and a further 2.5 million people in 2010. From 2008 to 2013, the number of people in employment decreased in this type of regions by 10.3 million altogether. Most of these regions had only limited scpoe for investment already in the past and the investments were mainly financed by EU Structural Funds. In the regions seen as being more resilient to the crisis and which show already strong signs of recovery, the employment remained mostly stable in 2009 in comparison to the year before.

The question is nevertheless, how stable the process of recovery in employment will be? Recent trends show a further decline in employment in the regions that have not yet recovered compared to the year before the crisis and a slight slowdown on the path of recovery in the so-called recovering regions.
Latest ESPON data (2011) on the regional Gross Domestic Product (GDP) show that the economies in the majority of European regions were growing again compared to the crisis year 2009.

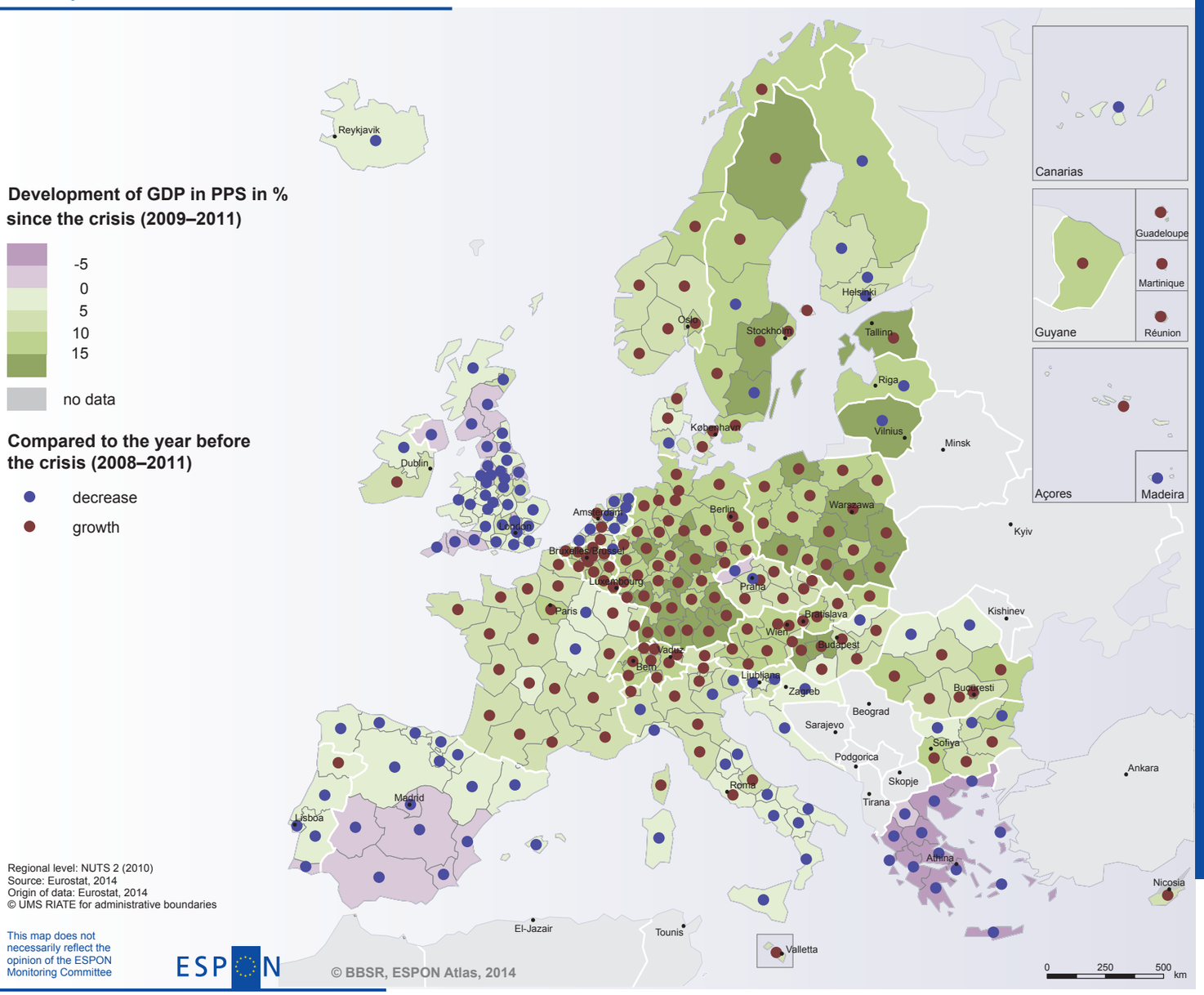
Belgium, Poland, Germany as well as the Baltic and the Scandinavian countries show the highest regional GDP growth rates measured by Purchasing Power Standards (PPS). The rates were much lower in the United Kingdom, France and the Netherlands. In many regions of northern England, southern Spain and Greece, the economic performance is still declining though.

The comparison of the economic performance before and after the crisis indicates, that many regions have not yet regained the economic strength of 2008 again. Some of them are far away from former economic strength. In Greece, Spain and the United Kingdom not one region reached the pre-crisis economic output, whereas the regions of Poland and South-Eastern Germany have a clear tendency to grow.

For many regions, the way out of the crisis seems to be more difficult. However, the growth rates since the crisis justify some optimism in other regions. For example, in the northern regions of Spain which were more affected by the crisis, a process of recovery is becoming apparent. It should be noted that regions with a positive development trend exist in all countries apart from Greece.

The crisis is not over in all parts of Europe. In some parts the employment continues to decrease. It is clear that further efforts are needed to prevent a deepening of the gap between regions lagging behind (even more than in the past) and the prosperous regions of Europe.

Development of GDP after the economic crisis



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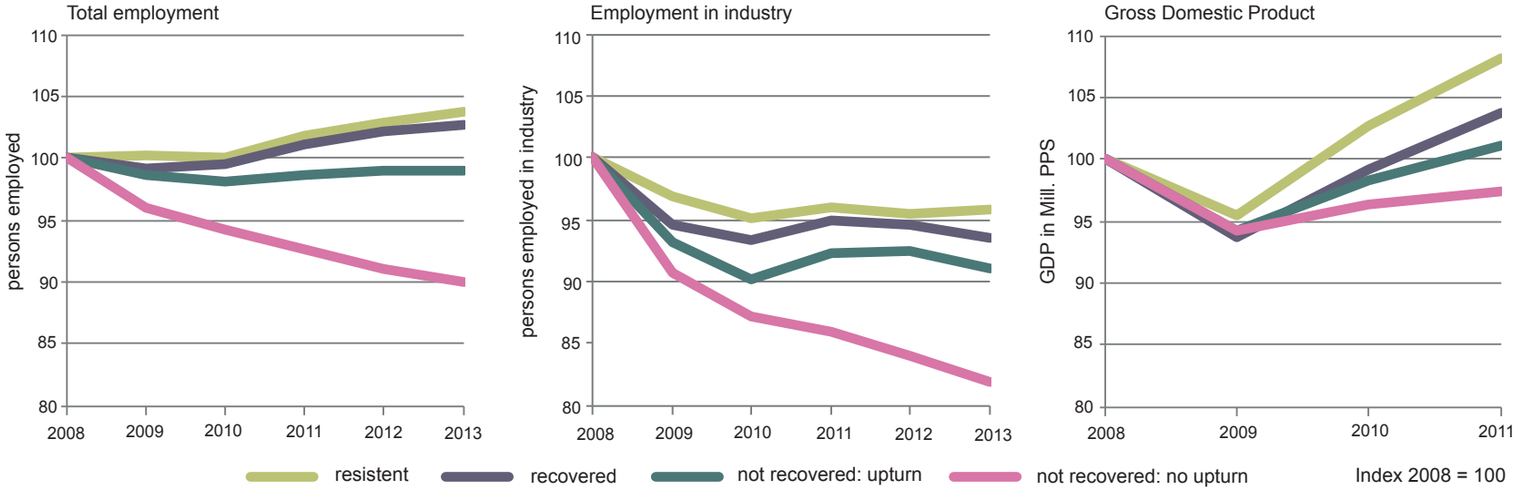
Development trends in different regional types of employment resilience to crisis



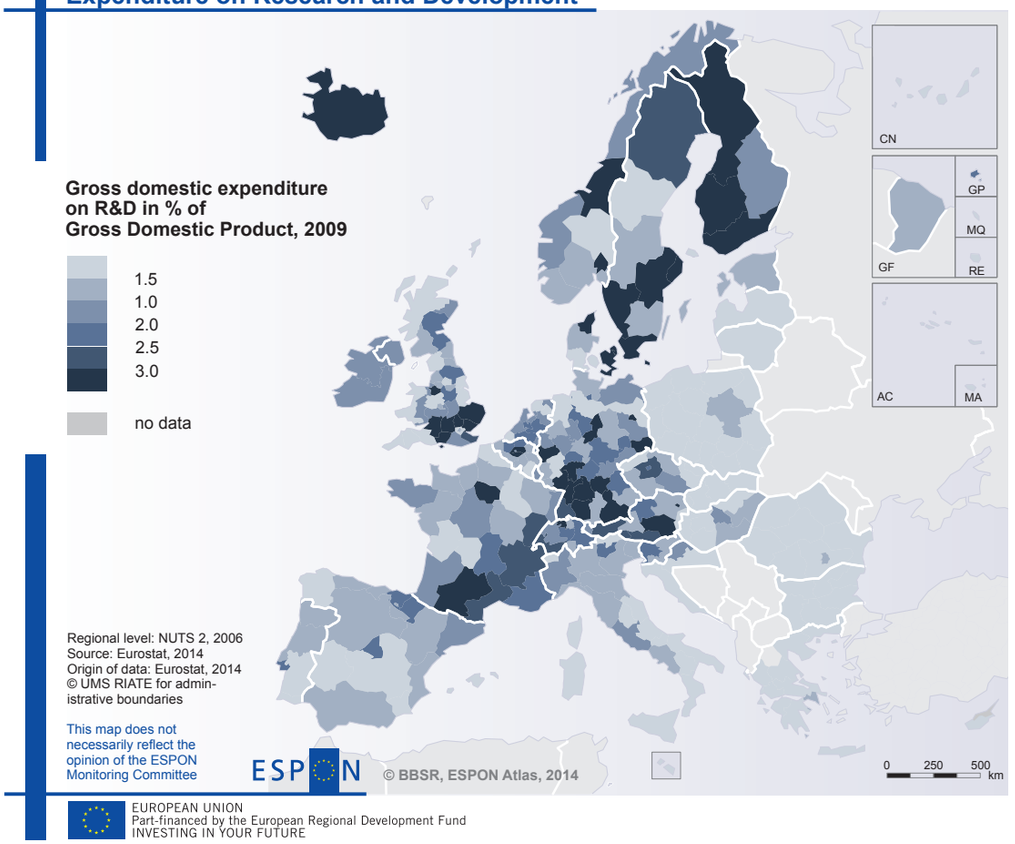
Source: based on ESPON ECR2, 2014; Eurostat, 2014

Territorial patterns of innovation

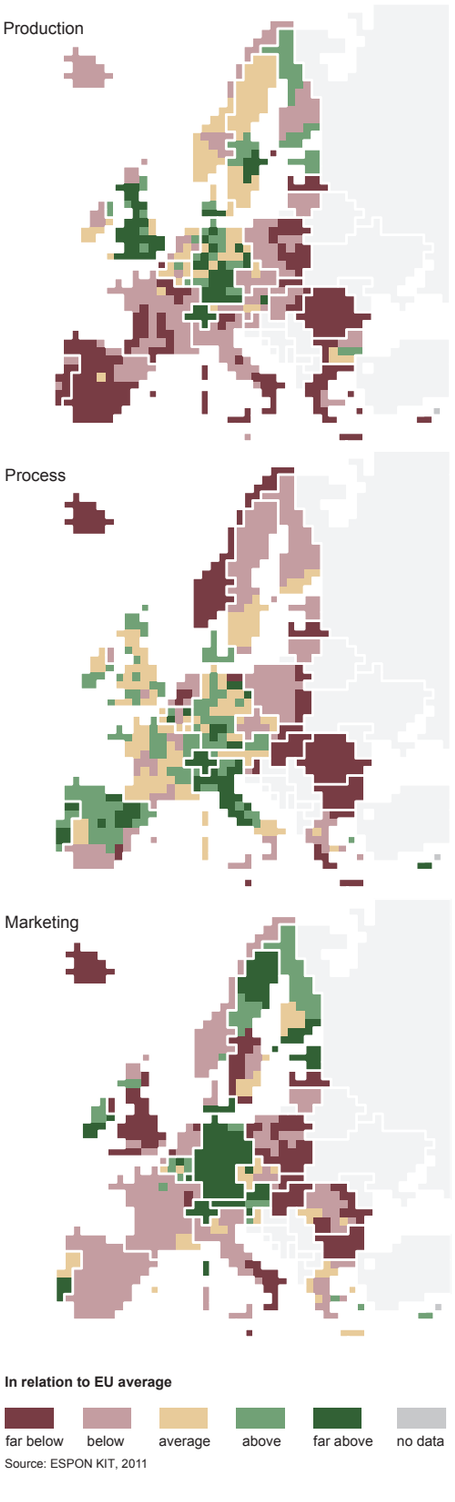
2.3 **million researchers**

have been engaged 2009 in the EU in the conception or creation of knowledge and products.

Expenditure on Research and Development



Orientation of innovation



Knowledge and innovation are recognised to be the strategic assets for “smart growth” in Europe. The identification of regional specificities in patterns of innovation is essential to build targeted normative strategies for policy goals.

The geography of innovation is complex and the capacity to turn knowledge and innovation into regional growth is different among regions. The orientation of regional innovation shows distinct hotspots related to production, processes and marketing. Three main territorial patterns of innovation could be identified:

1) Strong knowledge producing regions, which are either science-based or more applied science oriented. Their endogenous innovation takes place in scientific networks. The local conditions are present to support the creation of knowledge, the local diffusion, the transformation into innovation and the widespread local adoption.

2) Regions specialised in a smart technological application or smart and creative diversification. They have high product innovation rates and high creativity to translate external basic knowledge and applied science knowledge into innovation.

3) Imitative innovation regions with low knowledge and innovation intensity. In these regions, creative actors identify where knowledge is lacking outside their region and seek to adapt the existing innovation.

For the first group of regions, there is a need to foster R&D incentives to attract inventors, innovators and high skilled labour. Incentives for creative applications through co-operative research activities or search for new technological solutions are best suited for the second group of region. For the last group of regions, the support of the development of creative projects with multinational corporations may foster the economic base.

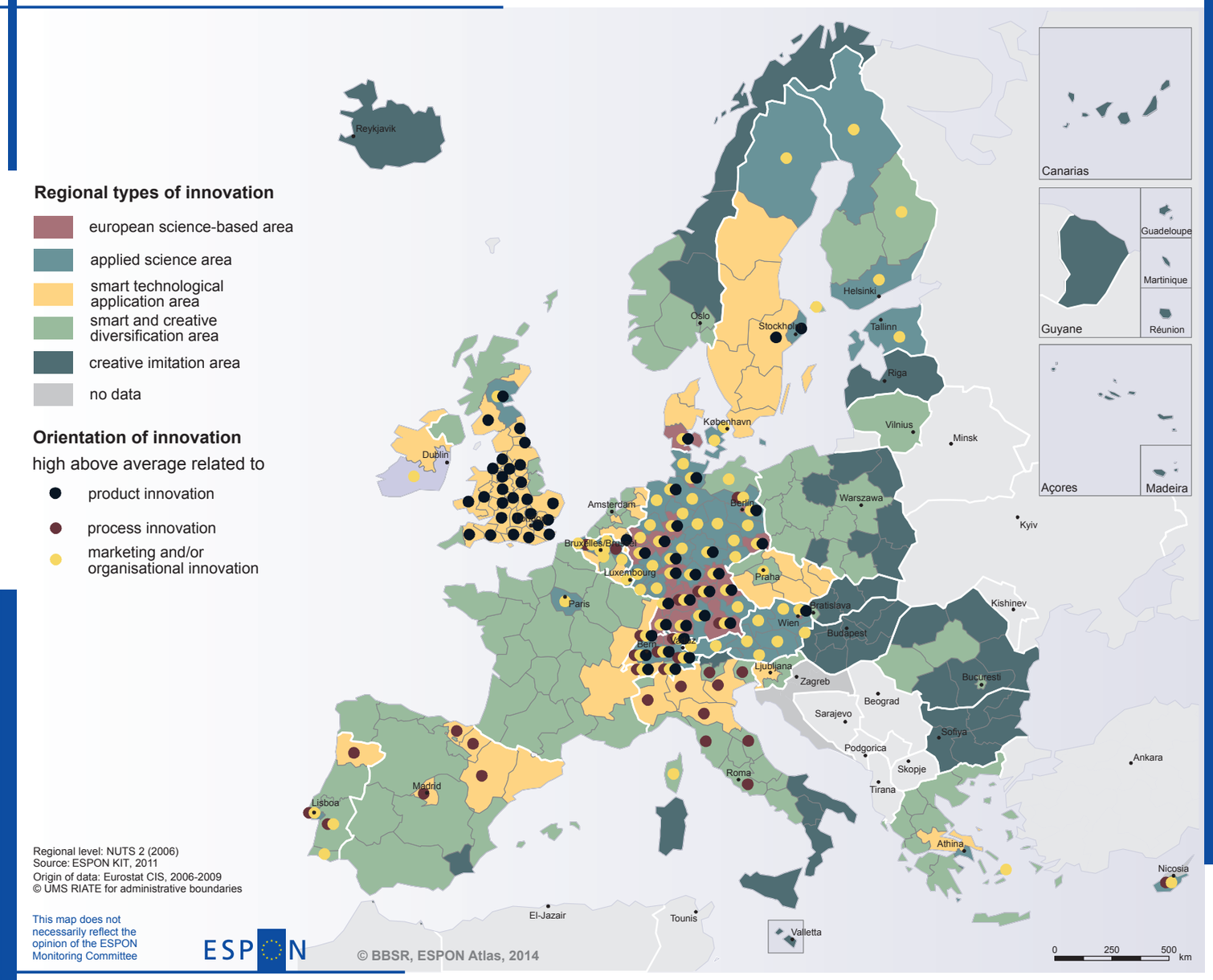
These territorial patterns of innovation make clear that knowledge cannot be equated with innovation. A territorially relevant aspect needs to be considered in the policy efforts of making Europe the most competitive knowledge-based economy. Furthermore, as stated in the EU2020 Strategy the investments in R&D will have to be increased to 3% of GDP.

In the European science-based area in average already 3.4% of the GDP is spent in R&D, whereas in the creative imitation regions the share of R&D in the regional economy is only 0.8%.

The importance of the knowledge producing regions in European R&D is obvious. More than 50% of the total EU R&D expenditures in 2009 are concentred in the science based and applied science areas, the smart technological area stands for another 27%.

In fact, R&D is more efficiently used in those regions that invest considerably in R&D. These regions are science-based, applied-science oriented or, to a lower extent, oriented to smart technological application areas. Regions with a low level of R&D spending will have only little benefit from further investments in this respect, but investments in intangible assets may be more effective.

Territorial patterns and orientation of innovation



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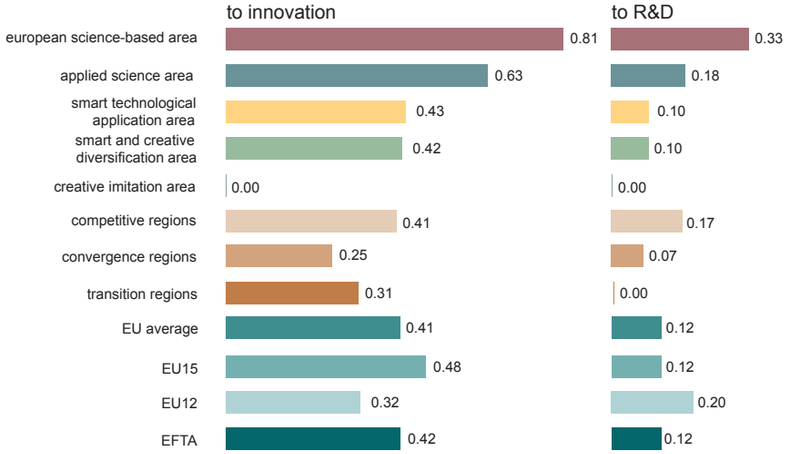
Influence of spending in R&D and innovation on GDP growth rate

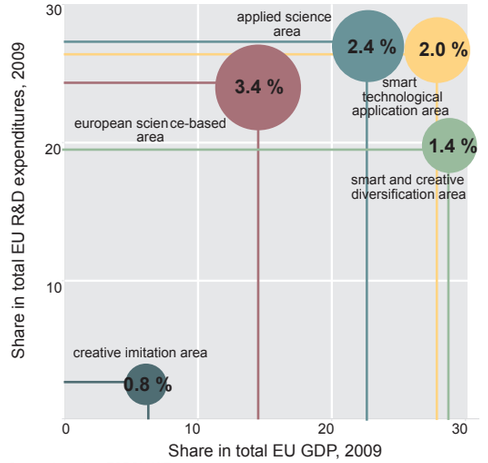
Percentage increase in GDP growth rate induced by 1 percentage point increase in R&D or innovation spending in different areas and regions



Source: ESPON KIT, 2011

Importance of regional types of innovation

Percentage of GDP for R&D expenditures reflected in the size of the circles



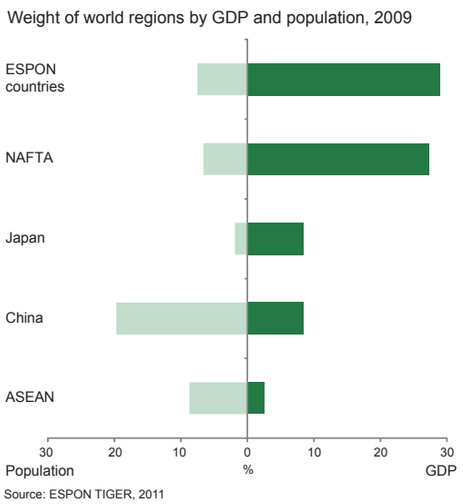
Source: based on ESPON KIT project

Europe and its regions on the global stage

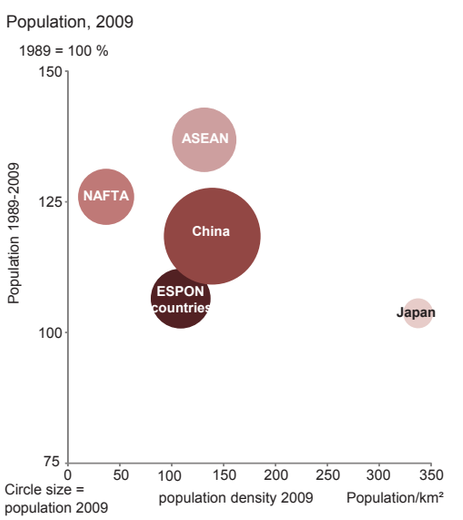
18 %

of the world GDP was produced within the EU by 7% of the world population in 2010. In 1950 the figures for the same geographical area amounted to respectively 15% and 28%. This decline is predicted to continue in the next years.

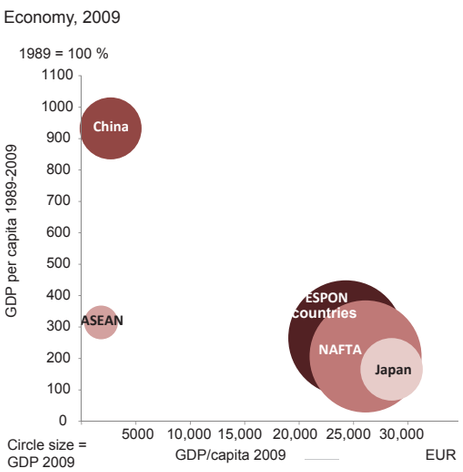
ESPON countries compared to world



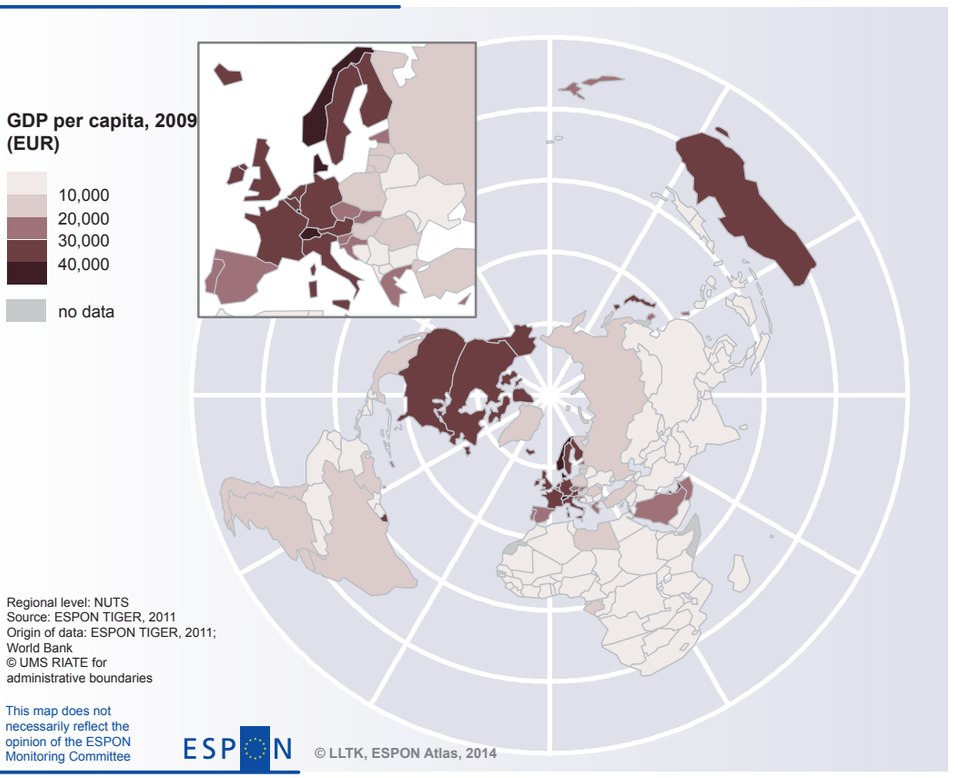
Source: ESPON TIGER, 2011



Source: ESPON TIGER, 2011



State of economic development



In the strategic policy documents of the EU, globalisation is identified as one of the four main challenges facing European regions in the future.

Globalisation has been defined as a growing interdependence between the different territories of the world. However, globalisation should not be understood as 'undirected interconnections' of all territories across the world. Indeed, naive, early readings of globalisation announced the 'death of geography', notably focusing on the potential locational impacts of new communication technologies. ESPON analyses also demonstrate the inaccuracy of this interpretation of globalisation. ESPON projects, through the analysis of financial flows, trade flows, human flows and knowledge flows highlight how distance and agglomeration economies have become even more central to globalisation.

Globalisation is seen as a very positive phenomenon for Europe. The way Europe will benefit from globalisation is clearly associated with its openness. According to the EU2020 Strategy all instruments of external economic policy need to be deployed to foster European growth through participation in open and fair markets worldwide. There is an economic potential for growth that Europe is able to generate by tightening the cooperation with the emerging economies. Furthermore, the biggest trading bloc in the world, the EU, will prosper by being open to the world and paying close attention to what other developed or emerging economies are doing to anticipate or adapt to future trends.

In the literature on globalisation, experts and researchers tend to see the scale effects of cities and regions as being more important than the scale effects of countries.

The most direct expression of globalisation is the increase or decrease of Gross Domestic Product (GDP). In this sense GDP per capita is very often used as a competitiveness indicator. Thus the most competitive areas are the NAFTA countries (North American Free Trade Agreement, including the United States, Canada and Mexico), Australia, Japan, and some major countries from the Middle East (Egypt, Saudi Arabia). However, in the long-term this indicator may show wider contrasts amongst these areas.

In the last two decades, China demonstrated the most impressive economic growth in the world, while developed countries such as Japan and the USA, or countries in Western Europe, showed only moderate growth or almost stagnation, despite the fact that these countries still own the largest share of global production.

Orientation of enterprises is a basic concept in the analysis of globalisation effects of business dynamics.

Globalisation is characterised by increased exchanges on a global scale and by a growing integration of the global economy. Since the end of the 1990s, trade, as a share of world GDP, has reached unprecedented levels.

There are several drivers which enhance the growth of trade of goods and services. Transnational firms, which are the main actors of the integration

of value chains at global level, play a central role in the growth. For example, the intra-firm trade is estimated at 30% of total world trade. The other important factor is that regional integration, through the creation of Customs Unions or Free Trade Areas, has largely developed economic exchanges between regional economies. The liberalisation of trade is also a major driver of trade growth. Finally, the new communication technologies as well as the decreasing costs of transportation have also contributed to the development of trade.

Globalisation is influenced by changes in the world economic geography including changes in the trade flows of goods and services. The main feature is the global shift from the US, the EU and Japan to East Asia, in particular to China.

At first glance, when considering long-term trends, the European share in world trade seems to have remained relatively stable. High level of intra-European trade is the most significant catalyser of this. At least 60% of the trade in Europe is between the ESPON countries. In line with this, Europe has experienced high levels of economic integration in the last decades; for example, intra-trade accounts for around 2/3 of the total European trade. However, after decades of growing integration, there are less positive signs.

Excluding the above mentioned aspect, a significant decline of Europe's role in the world trade becomes apparent. This decline is in line with the general decline of Europe on the global stage, especially in terms of population and production.

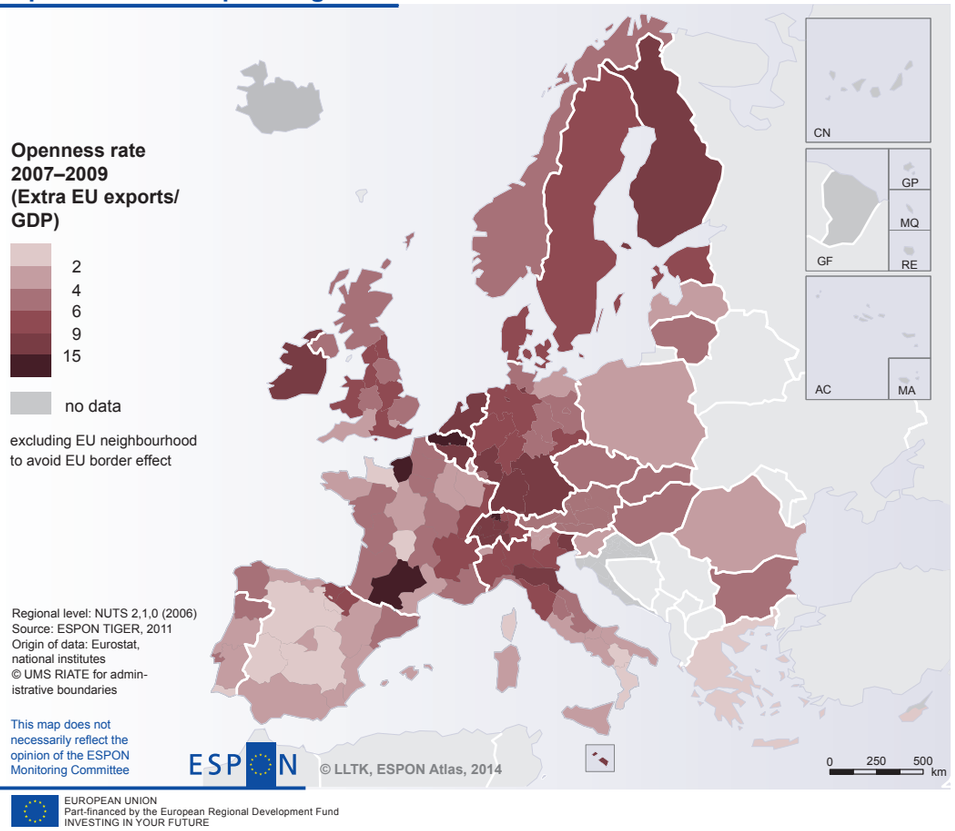
The trade relations of Europe with other parts of the world are quite different. Europe's weight of trade in Africa and surrounding countries is particularly high, but it is weak with most of the growing areas in South and Southeast Asia. Europe's trading role in North America and Asia is getting far less dominant. These processes are global, therefore they are not unique to Europe. For example, in addition to the "old core countries" of Europe, North America and Japan are also starting to lose their economic importance; meanwhile Asia, especially China, is growing.

Concerning the openness ratio to extra-ESPON regions (as an indicator which represents a country's position in the world), the most active regions are among the Western Member States such as the Benelux countries, Germany (in particular Southern Germany), Switzerland, Ireland and Finland. The Member States from Southern and Eastern Europe play a minor role, and have less weight in extra-ESPON trade. In these countries the aspects of trade are much more focused on internal European markets.

The EU is strongly affected by global processes, and has increased its links with the rest of the world in all types of flows. Europe as a whole still remains the most important trade area in the world and continues to play a major role in the global economy. It not only concentrates around 6% of the world population, but also accounts for:

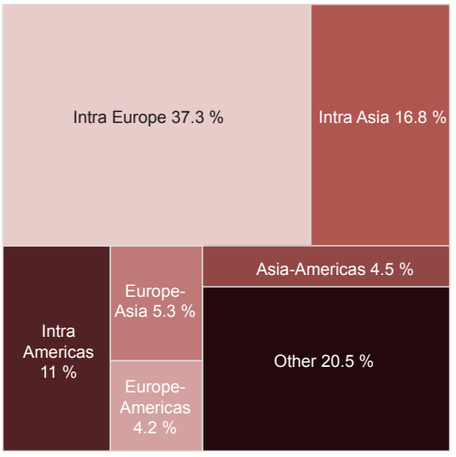
- 20% of inter-regional air connections;
- 22% of interregional trade of goods;
- 27% of inter-regional trade of services;
- 31% of interregional in/out flows of FDI;
- 21% of inter-regional migrations;
- 23% of inter-regional student flows.

Openness of European regions



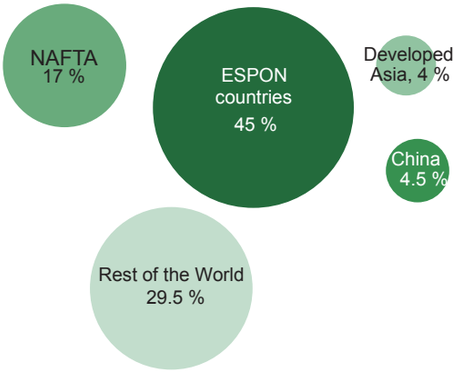
Trade in the world

Trade flows between world regions, 2007



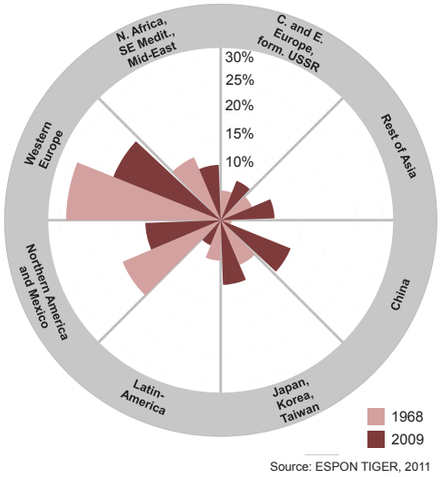
Source: ESPON TIGER, 2011

World regions in the trade of services, 2010



Source: ESPON TIGER, 2011

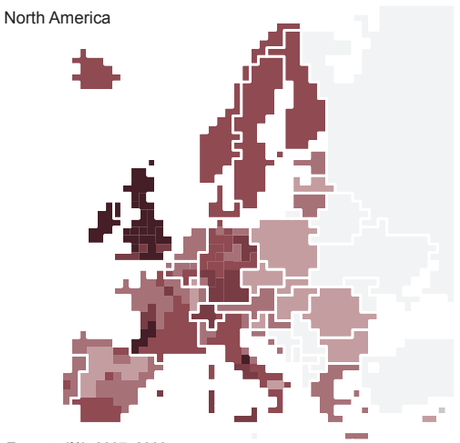
Centres of world trade, 1968–2009



Source: ESPON TIGER, 2011

Trade of Europe

North America



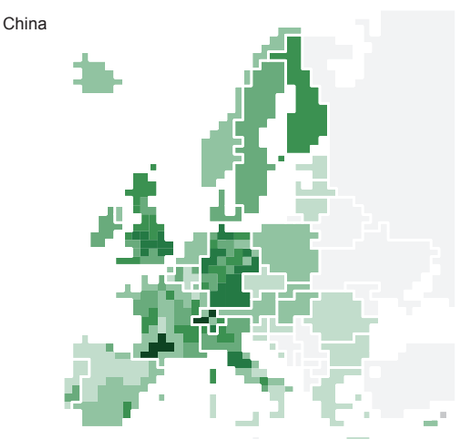
Exports (%), 2007–2009

3 6 10 15

no data

Source: ESPON TIGER, 2011

China



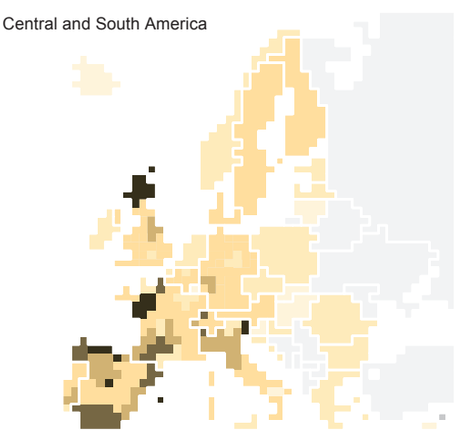
Exports (%), 2007–2009

1 2 3 4 6

no data

Source: ESPON TIGER, 2011

Central and South America



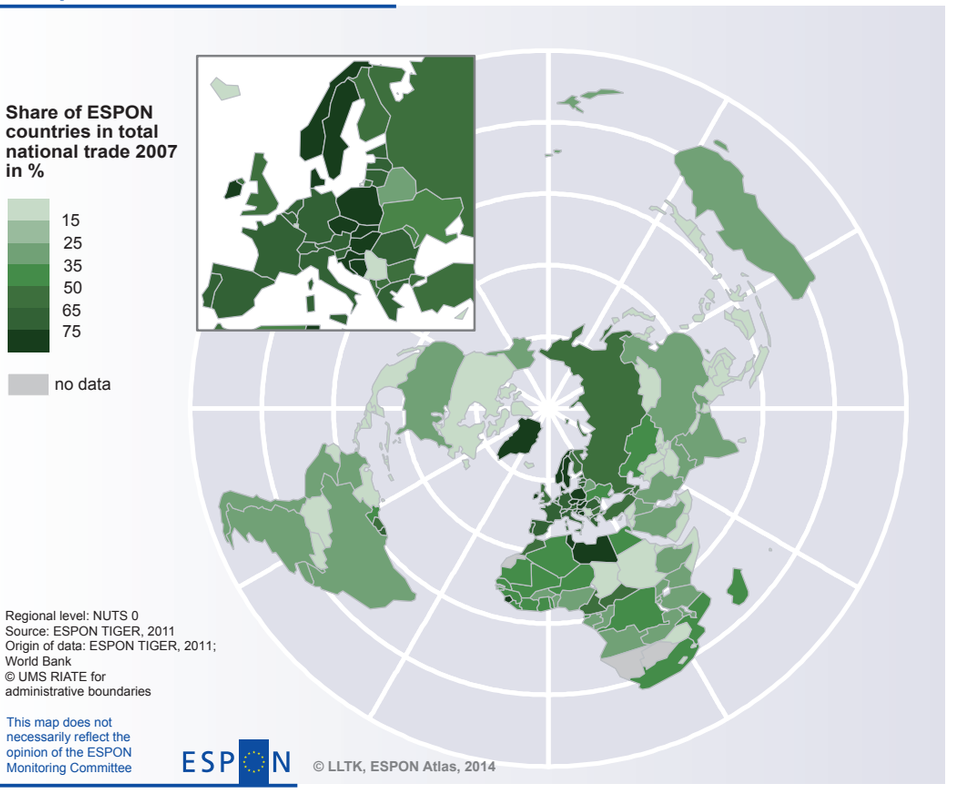
Exports (%), 2007–2009

0.5 1 2 3 4

no data

Source: ESPON TIGER, 2011

Europe in the trade of countries



Still, this strong integration in the global economy impacts the European territories very differently, because they participate with different levels of intensity and have a differentiated capacity to resist the increasing competitive pressure or to seize new opportunities relying on the access to new markets.

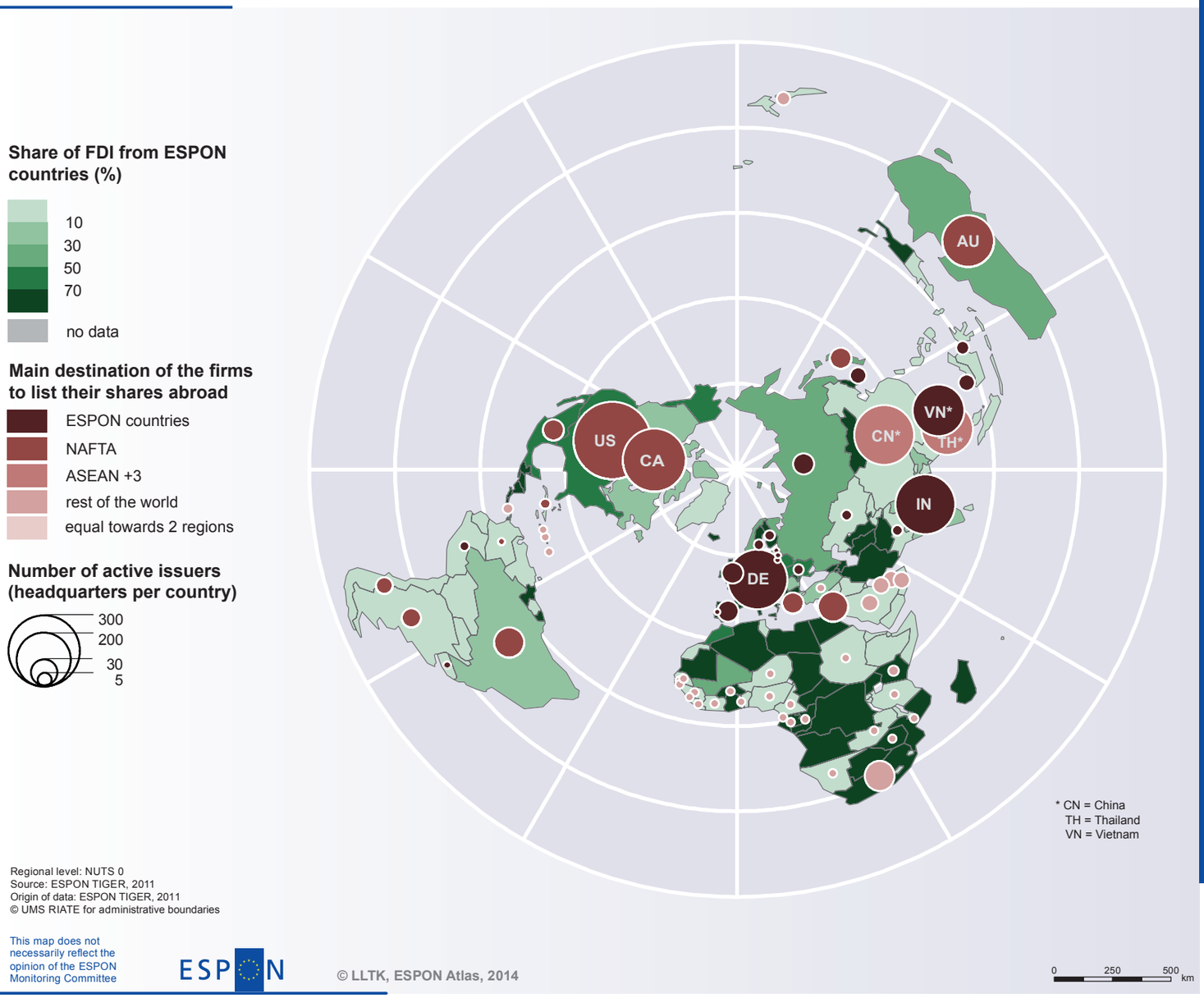
Europe remains a prosperous area, still at the top in the international division of labour, due to its specialisation in both medium and high technological goods and knowledge-intensive services, as well as the concentration of top level functions in global value. Nevertheless, Europe's declining economic role on the global market is evident, and will continue in the next decade, whatever types of relations are considered. This decreasing economic weight goes hand in hand with the shrinkage of its influence in most parts of the world.

Europe's influence on the global economic flows is more and more limited to its neighbours. Intensive trade relations beyond the ESPON territory underline the growing importance of the neighbouring countries from the east (former USSR), south-east (Turkey) and south (northern Africa).The functional weight in the world certainly supports the EU as a global political actor, which results in an active diplomacy. Europe is still attractive and remains the main origin of inwards FDI. North America as a region is by far the most important partner for Europe due to the links concerning economic relations, especially those related to firms. The neighbourhood regions are also of high importance for Europe. Those areas have strong relations with Europe in human and transportation flows, and to a lesser extent in trade of goods. However, they have a lower importance in most other economic relations.

Eastern Asia distinguishes itself by more intense relations of trade in goods and services as well as Foreign Direct Investment (FDI).

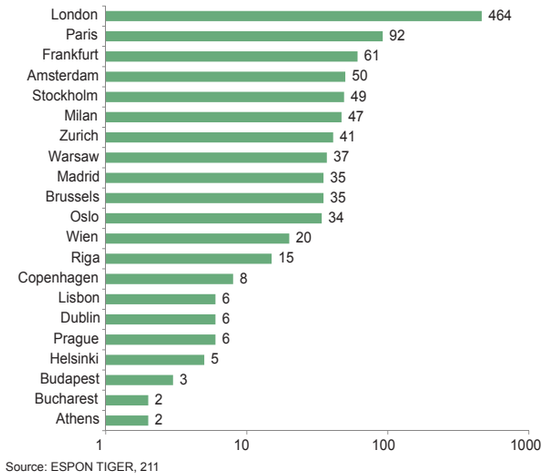
In summary, Europe has become more and more coherent in terms of its economic relations. In parallel, Europe's influence has been more and more restricted to the European neighbourhood, and within the neighbourhood, it reveals a shift from Southern and South-Eastern neighbourhood to the Eastern neighbourhood in particular after the end of communism.

World FDI flows, 2010



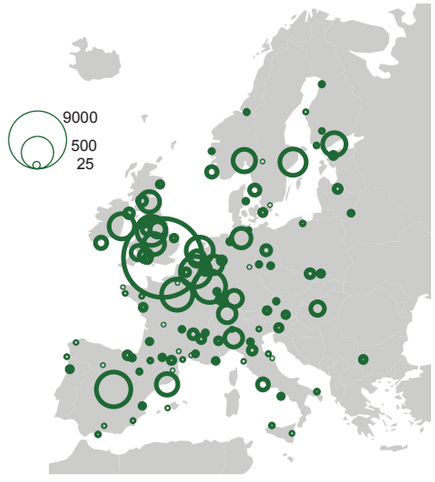
FDI in Europe

Foreign issuers in stockmarkets, 2010

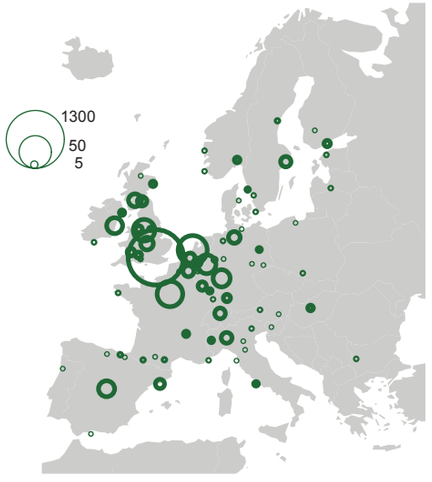


Source: ESPON TIGER, 211

North American subsidiaries in Europe, 2010



Asian subsidiaries in Europe, 2010



Economic structures – territorial synopsis

Europe is characterised by its diversified economic structure, but to some respect European regions show distinct tendencies of specialisation. The industry continues to decline in importance, in some countries like the United Kingdom more, in others like Germany less. The workbenches of Europe move East within the continent and also in the global perspective. The production in Europe itself is getting technically advanced, the production lines are internationalised and globalised. But Europe keeps its industrial heart with stronger manufactural oriented regions, some of them undergoing a period of restructuring, some already highly technology oriented and competitive.

Knowledge and innovation belong to the economic assets of Europe and the EU 2020 Strategy is heading to maintain and develop this economic strongpoint. In some regions activities related to research and innovation accumulate in terms of expenditures and investments, building in a broader territorial context “innovative basins” such as Central Sweden or South-East Germany.

The important metropolitan regions are the serving points of Europe connecting to the expanding global markets. High quality market oriented and financial services of international and global importance, trade, foreign direct investments (FDI) and innovation are located there. In the capital regions they are accompanied by high level political functions.

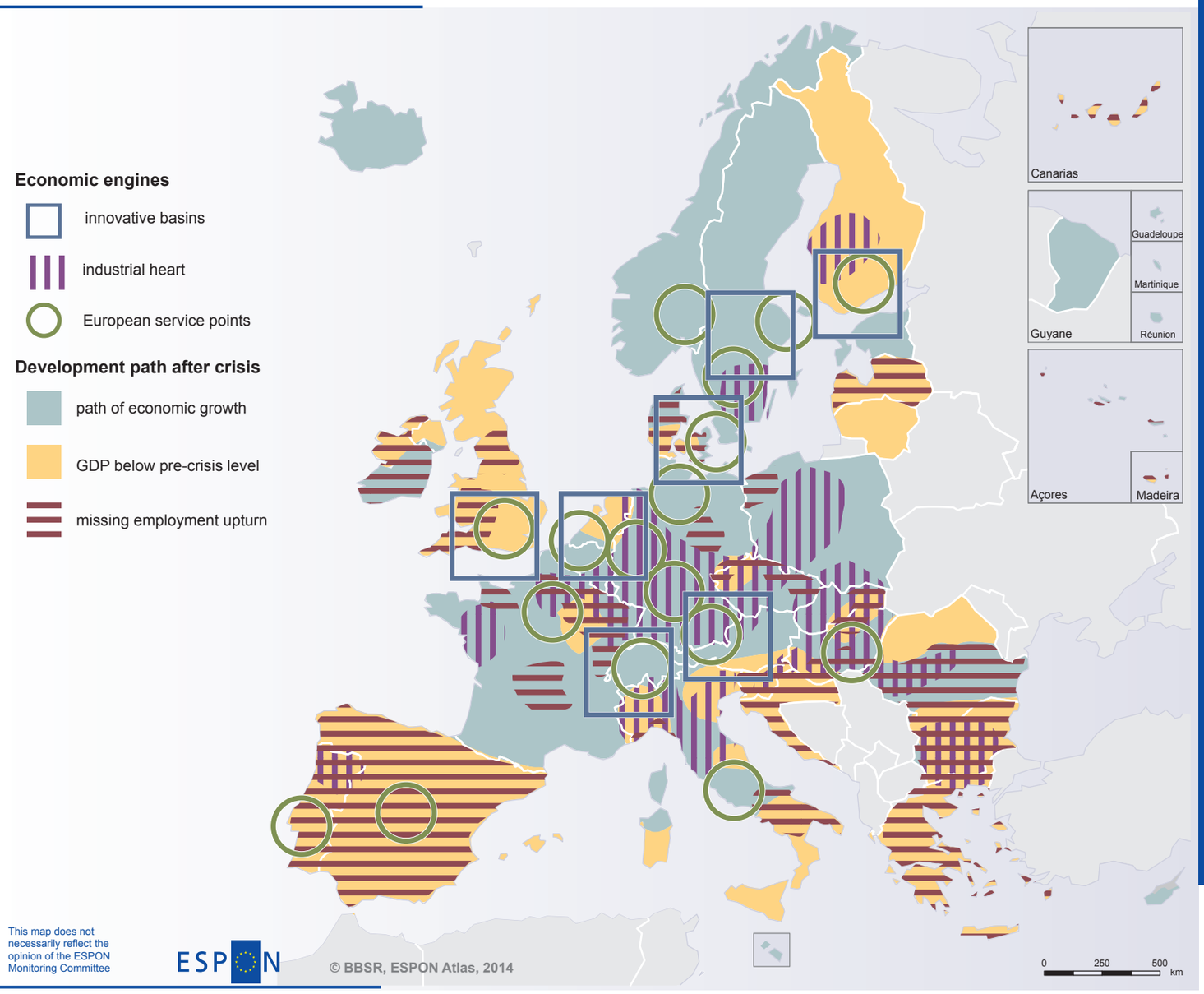
The economic downturn following the crisis affected the economic base of many regions in Europe. But as it shows, only some of the most industrialised regions in Europe have been affected by the crisis and in respect to development of the Gross Domestic Product (GDP), these regions are mostly already on their way out of the crisis. In relation to production, there are signs in all countries that at least some regions are recovering, but many regions have only just reached the same level of economic activity or are still below the level of GDP they had. Beside Portugal, Spain, Italy and Greece, this is also the case in the Netherlands, in the United Kingdom and Finland.

The development in employment does not follow this path of recovery. The total number of persons employed keeps on decreasing in regions even showing signs of GDP growth, especially in the South and East; and in many regions almost all over Europe the employment in industry shows partly dramatic decreases like in Spain.

The path to economic recovery needs to be sustained, especially in relation to employment. Regions with a GDP that is still below pre-crisis level and don’t show an upward trend in employment need particular support. Greater support must be given to some East European regions, where several industrial areas need more time to catch up.

In many European regions, there are sectors of the economy, such as financial services, real estate, advanced producer services and innovation hubs which play an important role in sustaining the post-crisis economic recovery. Efforts have to be made to support those regions that have not yet reached the pre-crisis level of economic activity.

Economic structures – territorial synopsis



This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

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V. Linkages and accessibility

The quality of transport infrastructure and services is considered a decisive factor for the development of cities and regions. Key to this is accessibility. Accessibility is a multifaceted concept which has two key components: one representing the activities or opportunities to be reached and one representing the effort, time, distance or cost needed to reach them. Accessibility determines the locational advantage of an area relative to all other areas. Indicators of accessibility measure the benefits households and firms in an area enjoy from the existence and use of the transport infrastructure relevant for their area. By this, accessibility can be a location factor for economic activities as well as a factor for the quality of life of the population. Accessibility can thus be understood as important 'product' of the transport system for territorial development at all spatial scales.

The Common Transport Policy has been an essential component of EU policy since the Maastricht Treaty of 1992, when the further development of Trans-European Transport Networks (TEN-T) was introduced as a competence of the EU. A special emphasis was placed on interconnection and interoperability of the diverse national networks. The latest revision of the TEN-T of 2013 makes a conceptual distinction between a core network to be functional by 2030 and a comprehensive network to be in place by 2050. The core network should ensure efficient multi-modal links between the EU capitals and other main cities, ports, airports and key land border crossings. The comprehensive network should be a Europe-wide transport network ensuring the accessibility of all regions in the Union.

The TEN-T were included in the European Spatial Development Perspective (ESDP) of 1999 as a major policy field. Their importance for European spatial development has already been recognised because of the effects on both the functioning of the Single Market and on the economic and social cohesion. Good accessibility of European regions is considered to improve their competitive position but also the competitiveness of Europe as a whole. In line with its spatial vision of polycentricity, the ESDP called for improvement of links between international/national and regional/local networks and strengthening secondary transport networks, including efficient regional public transport systems, improvement of transport links of peripheral regions and promoting the interconnection of inter-modal freight hubs.

The vision of polycentric territorial development of the ESDP was taken up in the Territorial Agenda of 2007, which highlighted the territorial dimension of cohesion and emphasised the importance of integrated and sustainable multi-modal transport systems; however, it failed to set priorities. Polycentric and balanced territorial development is strengthening the second component of accessibilities, the opportunities to be reached. The new Territorial Agenda 2020 places spatial development into the framework of the EU 2020 Strategy. Several of the territorial priorities address accessibility issues. This includes the integration into the global economy, the enhancement of accessibility of rural, peripheral and sparsely populated territories, the access to urban centres, fair and affordable accessibility to opportunities and services of general interest, access to all kinds of transport networks and the further development of the TEN-T.

The Common Transport Policy is seen by the Sixth Cohesion Report as important contributor to cohesion and regional development by improving accessibility in particular for regions far away from the centre of the EU.

Trans-European road and rail networks

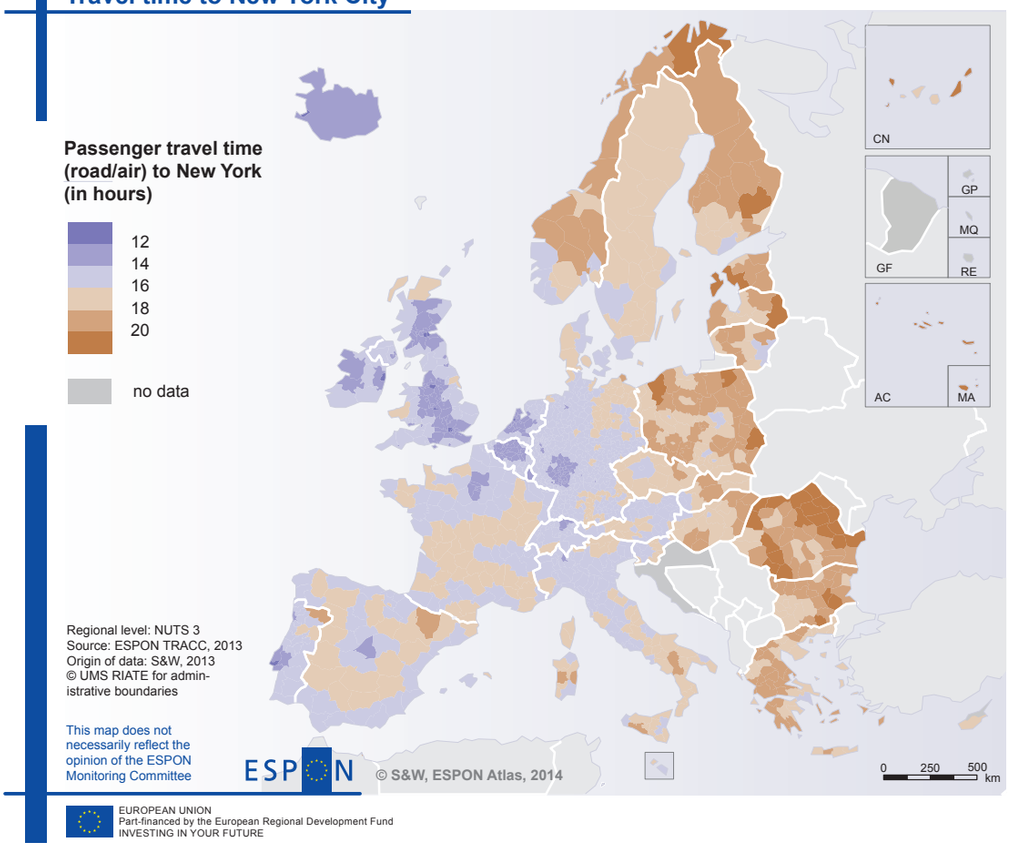
Origin of data: RRG GIS Database, 2014

Regional linkages to the world

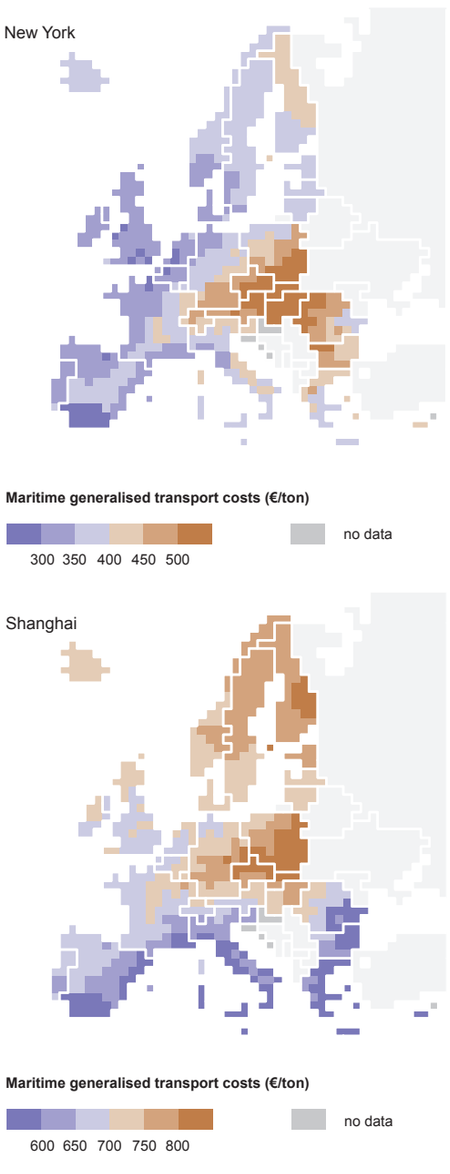
316 million

air passengers were carried between airports in the European Union and extra-EU destinations in the year 2012.

Travel time to New York City



Access to global freight hubs



Source: TRT, 2012, ESPON TRACC Project

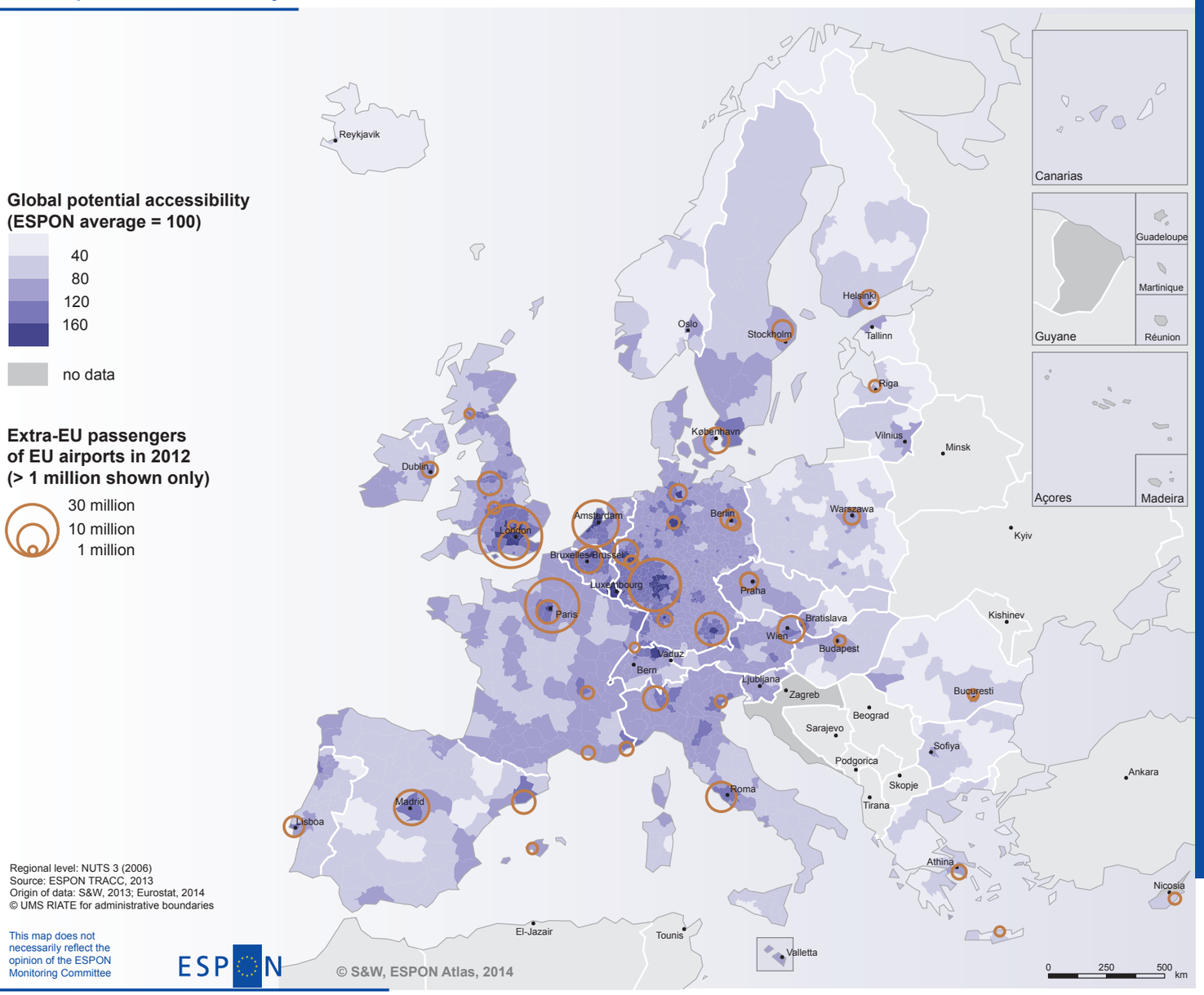
The global integration of regional economies in Europe is usually analysed by economic indicators such as trade relationships, export and import rates, foreign direct investments, headquarter functions or firm networks. But important are also the transport related linkages of European regions to the world, for instance the connections to global hotspots outside Europe or to European gateways to the world. The necessary transport effort to such destinations shows how European regions are embedded in the global economy seen from an accessibility point of view.

An easy to understand, but powerful measure to depict the transport-related integration of European regions into the global economy is to look at travel times to/from global hot spots (e.g. New York City). Travel times from European regions to this most important global financial centre differ very much. There are a few regions closely located to airports with intercontinental flight services in western parts of Europe from which the total travel time is below 12 hours. Regions with up to 14 or 16 hours travel time are located around those airport regions. However, travel times clearly increase up to 18 hours in other regions of Western Europe that have a longer access to intercontinental flight services. Travelling from capital city regions in eastern or northern Europe takes already three, four, five hours more than from western capital cities. Longest travel times occur from non-metropolitan regions in northern and Eastern Europe; for few regions it might take almost a full day to travel to New York.

Comparable accessibility indicators for global freight transport estimate the transport costs to/from global freight hubs such as New York or Shanghai. The accessibility to intercontinental global hubs by sea is significantly affected by the geographical position of regions. In general, western European regions are more accessible to the New York hub, while south-eastern European regions are more accessible to the Shanghai hub. The strong rise of the Far East as trade partner opens new opportunities for Mediterranean regions as logistic hubs. However, in most cases the accessibility to European intercontinental ports is more critical than the connection from the European port to the overseas port. In other words, the navigation time for deep sea shipping is usually far less important than the time and cost of the European leg of the shipment.

The use of global potential accessibility indicators is a more comprehensive way to assess the integration and position of European regions regarding global connectivity issues. Seen from an accessibility perspective, the integration of European regions in the global economy is very heterogeneous. For passenger travel in particular, huge differences exist between European regions in terms of linkages to global destinations and global accessibility. Global accessibility for passengers of European regions is mainly determined by the spatial distribution of international airports and the intra-continental services offered. Regions in eastern and south-eastern Europe, with the exception of capital regions, in the northern periphery and also in rural areas in France and the Iberian Peninsula are seen from a transport point of view much less integrated in the world economy than other regions in more central parts of Europe.

Global potential accessibility



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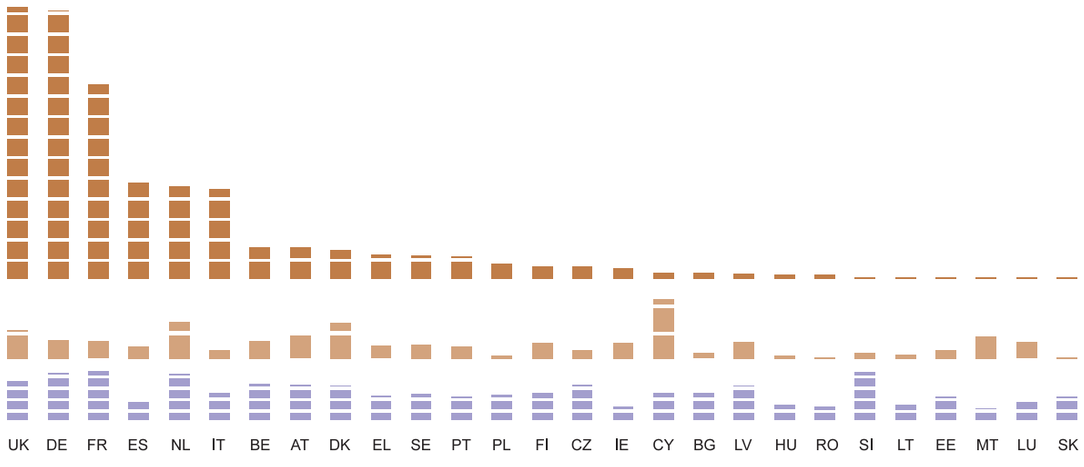
Extra-EU air passengers by country



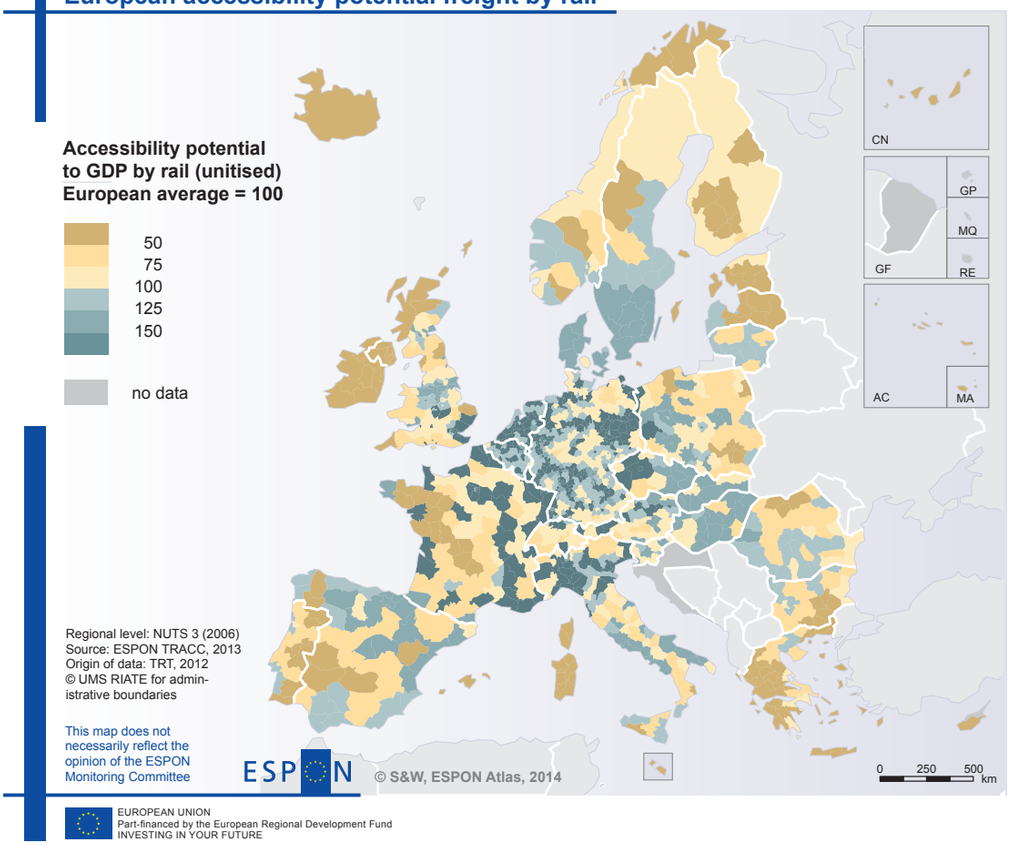
Origin of data: Eurostat, 2014

European accessibility

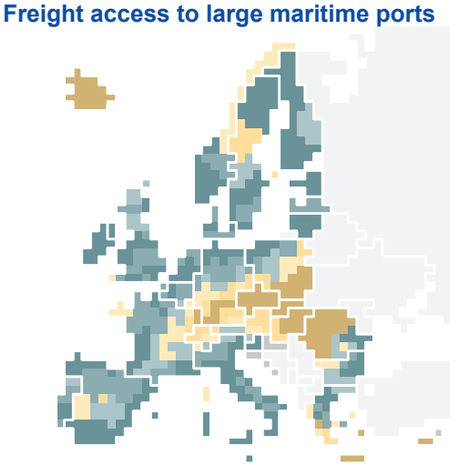
6446 billion

passenger kilometre and 3822 billion tonne kilometre was the total volume of transport in the EU in 2011

European accessibility potential freight by rail



Freight access to large maritime ports

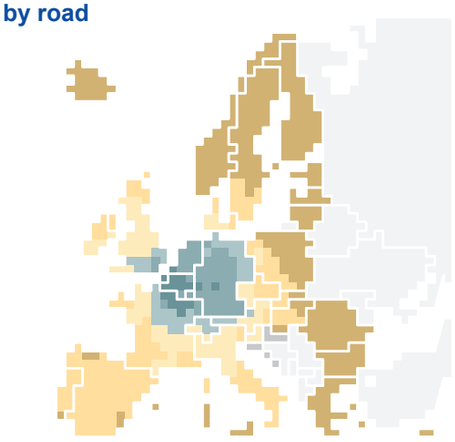


Generalised costs (Euro/ton) to reach next maritime port (> 4 million tons), 2010

50 100 150 200 250 no data

Source: MCRIT, 2012, ESPON TRACC

European daily accessibility freight by road



GDP (in 1.000 billion Euro) accessible within allowed lorry driving time of 13 h, 2011

0.5 1.5 2.5 3.5 4.5 no data

Source: TRT, 2012, ESPON TRACC

Accessibility in the European context has numerous dimensions. European accessibility indicators provide different assessments of the attractivity and competitiveness of European regions based on their location and their integration in the transport networks. An important distinction is to be made between accessibility for passenger travel and accessibility for freight transport.

A large volume of freight coming from intra-European trade is moved by ships, however, most of this consists of large shipments of bulk goods. As far as daily shipments of intermediate as well as final products are concerned, inland modes of transportation are dominant. Therefore, a representative picture of European freight accessibility needs to consider all modes of transport.

The accessibility to closest port with a yearly transport volume of at least 4 million tons provides an integrated measure of the level of accessibility of regions with respect to maritime freight terminals as important element in the economy to allow exports of local commodities and imports of foreign goods. Coastal regions are generally more accessible. Nevertheless, geographical position is not the only decisive factor and even coastal regions may have low accessibility if infrastructures such as ports, other terminals and hinterland connections are not adequate.

Inland freight transport is dominated by lorries. One way to measure regional freight accessibility by road is to accumulate the size of regional GDP which can be reached within the legal daily driving time of a truck driver. The spatial pattern of this indicator is representative for many freight based accessibility indicators at European scale. A group of regions in the central-western part of Europe have a clear advantage in terms of freight accessibility. This favoured group of regions covers the Benelux, the western parts of Germany, the northern edge of France and the southern side of the UK. Around this core area, other neighbouring regions may be very well positioned according to one or more freight indicators even if there is always at least one measure for which they are significantly weaker than the core area. For instance, Denmark has good accessibility levels by water and also by unitised rail, but it is well below the average for road.

A separation between unitised and non-unitised goods is especially relevant for rail transport. Non-unitised goods do not need intermodal centres, but just the rail network, which is quite homogenously available over the European territory. But for combined road and rail transport of unitised goods such as containers the proximity to intermodal centres becomes a very significant accessibility factor. Thus, despite an overall decrement moving from the centre to the European periphery, there are some regions e.g. in Italy, southern France or the Czech Republic with accessibility levels for unitised rail freight higher than for example some German regions. The position of intermodal centres is also detectable in the differences of accessibility of regions in many other countries. The current spatial pattern of unitised rail accessibility is established by those regions that have built a competitive advantage in infrastructural and logistical terms for combined transport. This is currently the most dynamically growing segment of rail freight.

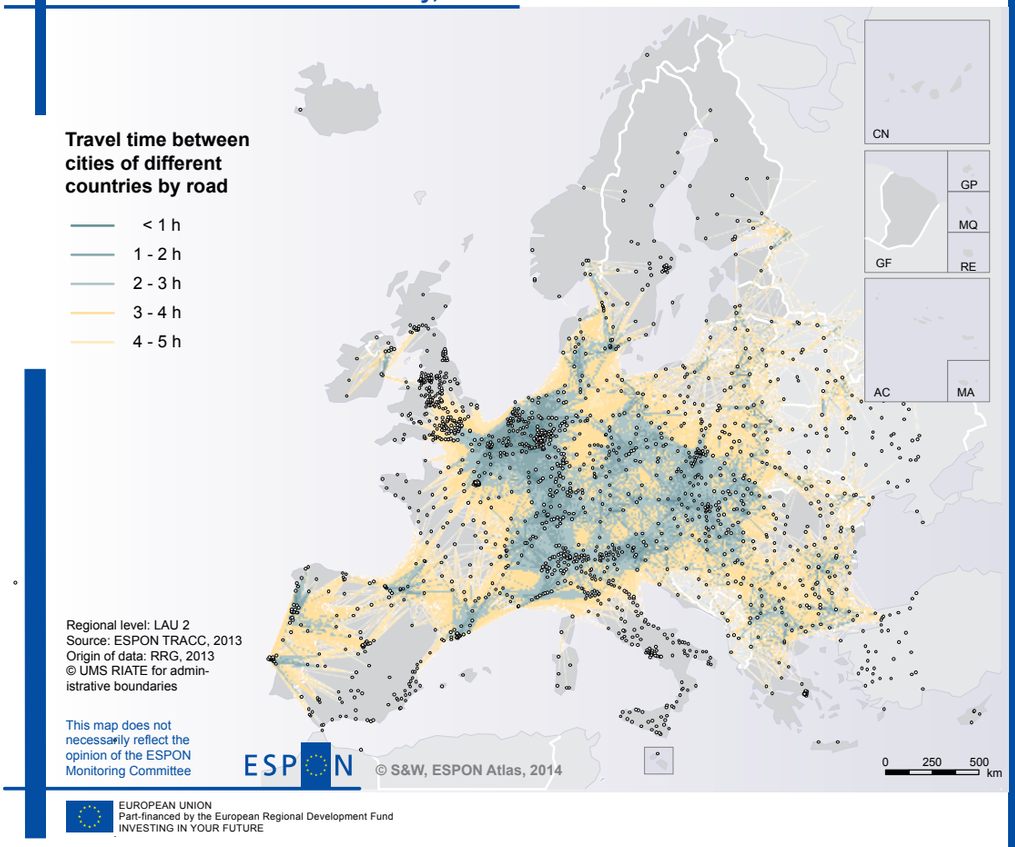
Transport infrastructure and transport services are connecting places and are enabling interactions between the different actors located in those places. In an integrating Europe, the opportunities, or also restrictions for cooperation between places situated in different countries provided by the transport system are of specific relevance. International urban connectivity is one example indicating city pairs between which travel is possible within certain maximum time bands of up to five hours. The higher the number of possible connections to other cities, the greater are the opportunities for business activities, city networking or for social interaction.

International urban connectivity by road is predominantly restricted to relations between neighbouring countries. The cities in the Benelux area, northern France and western Germany are those with highest accessibility. The same goes for relations between Portugal and Spain, Spain and France, France and Switzerland and Italy. There are also many fast city-to-city relations along the former Iron Curtain between East Germany and Poland and the Czech Republic, between Austria and Slovakia and Hungary, as well as between Italy and Slovenia and Croatia.

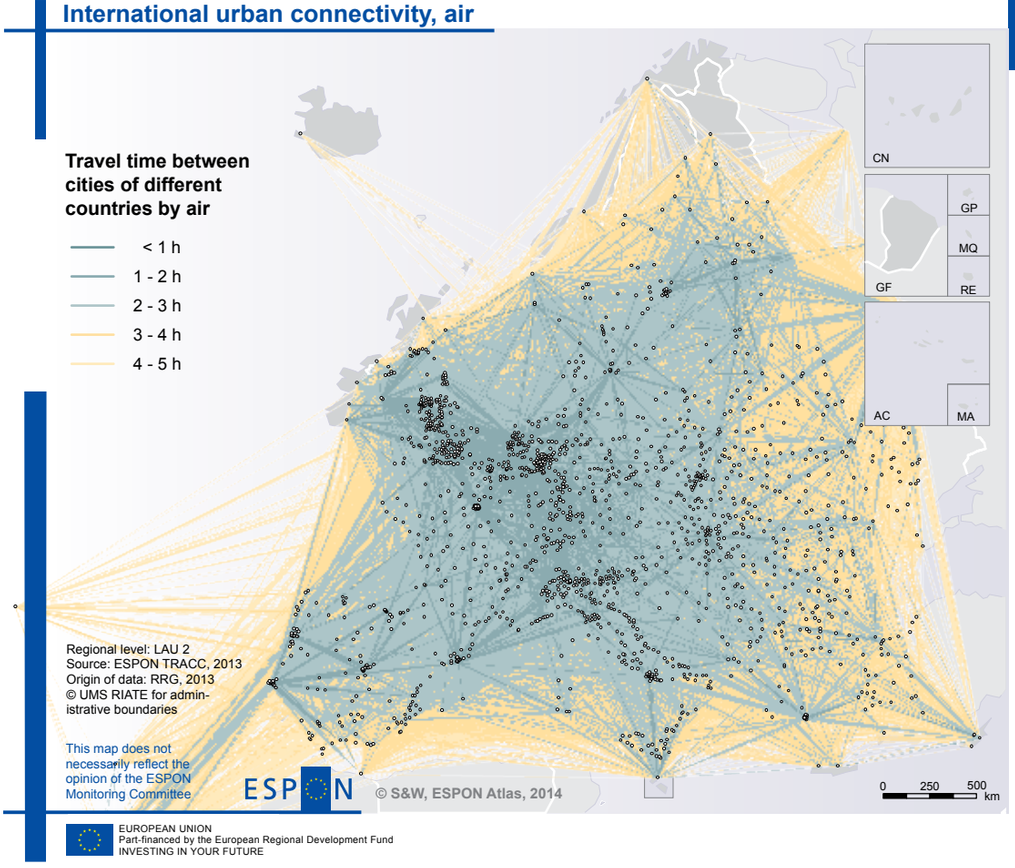
International urban connectivity by rail shows a similar pattern with highest connectivity around Benelux countries. Compared to connectivity by road, there are two important differences. International urban connectivity by rail in eastern and south-eastern Europe is clearly less developed compared to road connectivity. On the other hand, high-speed rail services offer additional opportunities for city networking in many western European countries.

Passenger flights add another dimension of urban connectivity on top of fast train services. Within five hours' travel time between city centres, the majority of European cities can reach most other cities. This is the case with basic international urban connectivity of cities of peripheral regions such as Northern Scandinavia and Iceland, Cyprus and Malta, Portuguese, Spanish and Greek islands, and cities in Eastern Europe.

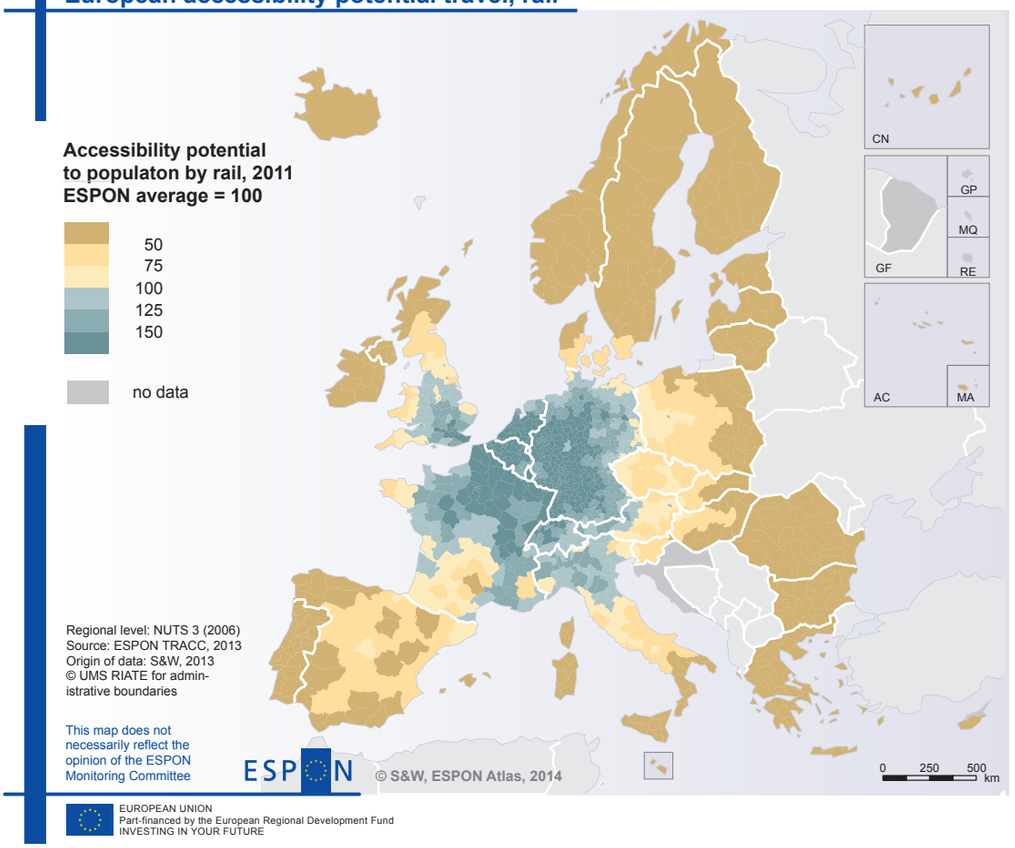
International urban connectivity, road



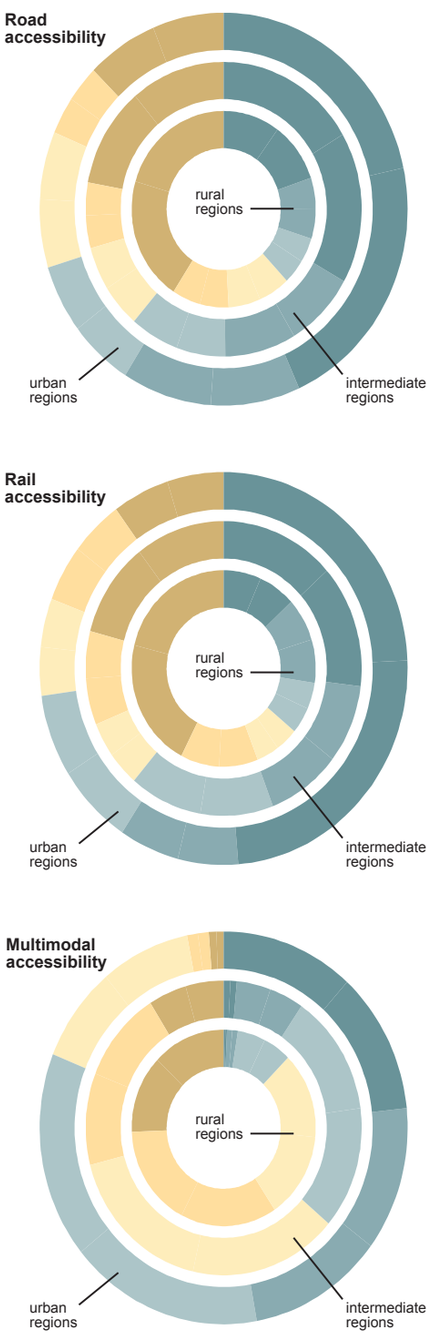
International urban connectivity, air



European accessibility potential travel, rail



Accessibility potential travel, multimodal, by urban-rural typology



Source: ESPON TRACC, 2013
Origin of data: S&W 2013

Most accessibility indicators for passenger travel display huge disparities across Europe. This is particularly visible in the potential type of accessibility indicator. This type of indicator measures accessibility of a region as the sum of population in all regions always weighted by a function of travel time to reach the regions. The accessibility indicators are standardised to the ESPON average which is set to 100. This allows to identify regions that have different degrees of peripherality or centrality or are intermediate regions around the European accessibility average.

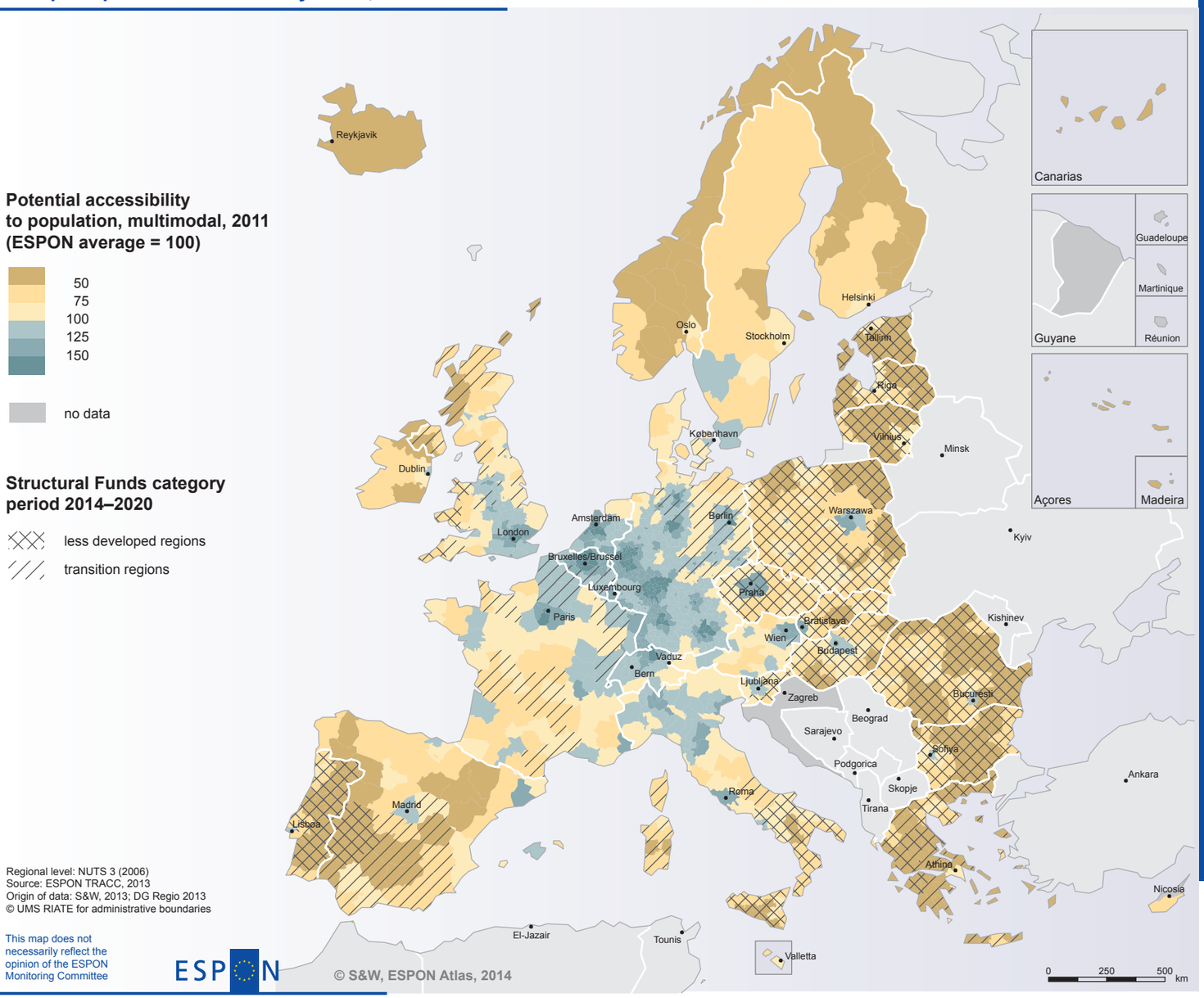
Accessibility potential by road and rail show the traditional core-periphery pattern in Europe with highest accessibility in Belgium and neighbouring regions of Germany. Because high-level road infrastructure serves all regions there, they all have highest accessibility by road. Because high-speed rail serves hubs and corridors, highest accessibility by rail is mainly visible along major rail corridors. In addition, high-speed rail is able to extend the areas of high accessibility to regions out of the core area. This is in particular the case in France with the corridors of high accessibility towards the Atlantic and the Mediterranean Sea. For both modes of transport, accessibility decreases gradually when going to regions further away from those high-accessibility areas.

Multimodal accessibility potential is a way of aggregating road, rail and air accessibility in one single indicator. Multimodal accessibility potential shows a distinct picture which is very much influenced by air travel. The major airport regions and their close surroundings have highest accessibility. This is also true in countries that have lower accessibility for other modes of transport. Disparities in accessibility are now visible between but also within countries. Multimodal accessibility as a combination of the three modal accessibilities shows a somewhat intermediate spatial pattern. It can be seen that regions that are not served by good air connection might be compensated by other good transport links for road and in particular rail. However, while this is true for regions in France or Germany, it is different for regions in Eastern Europe.

A differentiation of accessibility potential by region type shows that urban regions are performing better than rural regions. About 70 percent of urban regions have accessibility by road and rail above the ESPON average, almost half of the urban regions are more than 50 percent above the average. Less than 20 percent of urban regions have multimodal accessibility below the average, however most of them are just below the average. Conversely, rural regions are characterised by low accessibility. About 40 percent of rural regions do not reach half of the averages for road and rail accessibility; almost 90 percent of rural regions have a multimodal accessibility below the average.

There is a strong tendency that regions with high accessibility are also performing well in economic terms and vice versa. With very few exceptions, regions with very low accessibility have also a low GDP per capita and thus are eligible for Structural Funds. The exceptions are mainly regions in the Nordic countries that have a good economic performance that is not dependent on very high accessibility potentials.

European potential accessibility travel, multimodal



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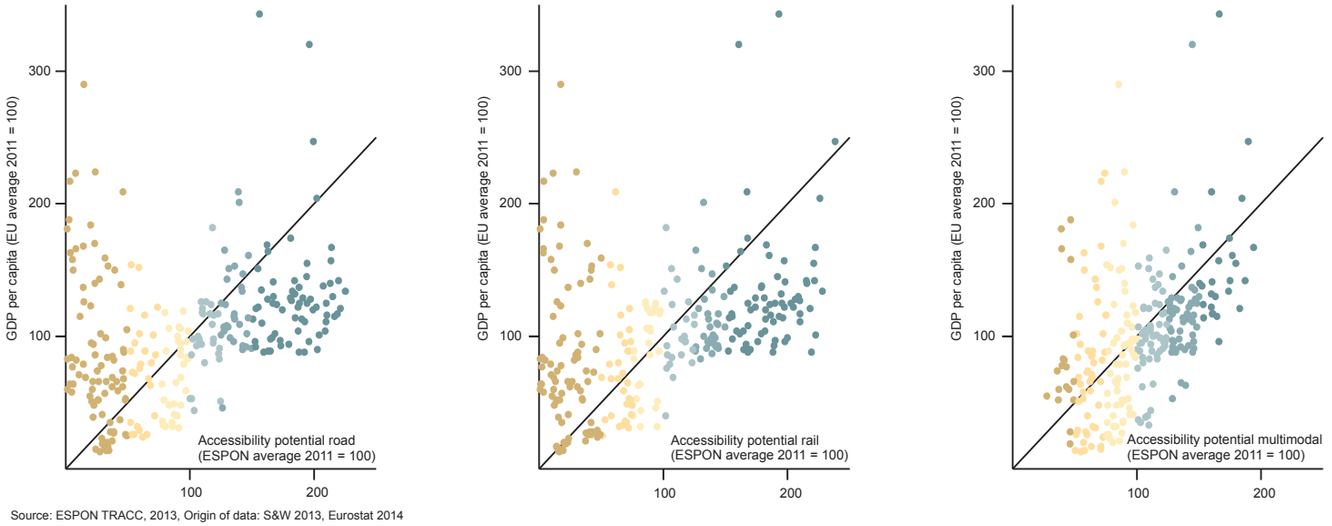
Accessibility potential and GDP per capita



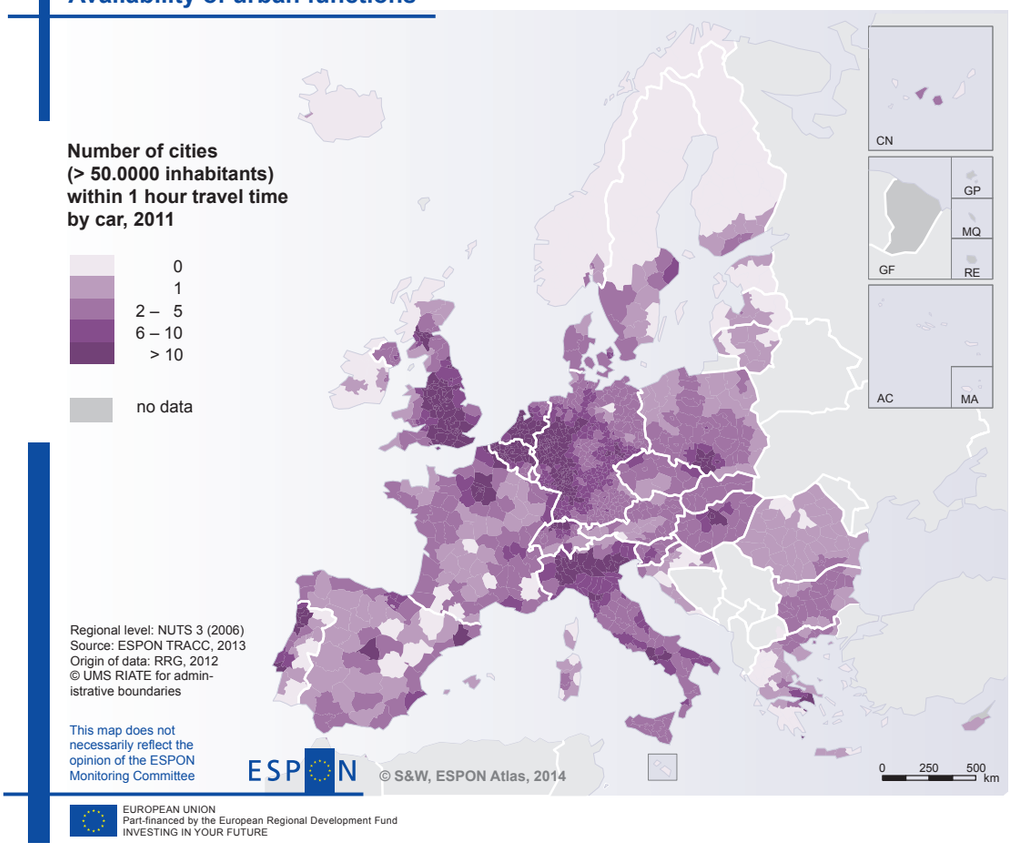
Source: ESPON TRACC, 2013, Origin of data: S&W 2013, Eurostat 2014

Local and regional accessibility

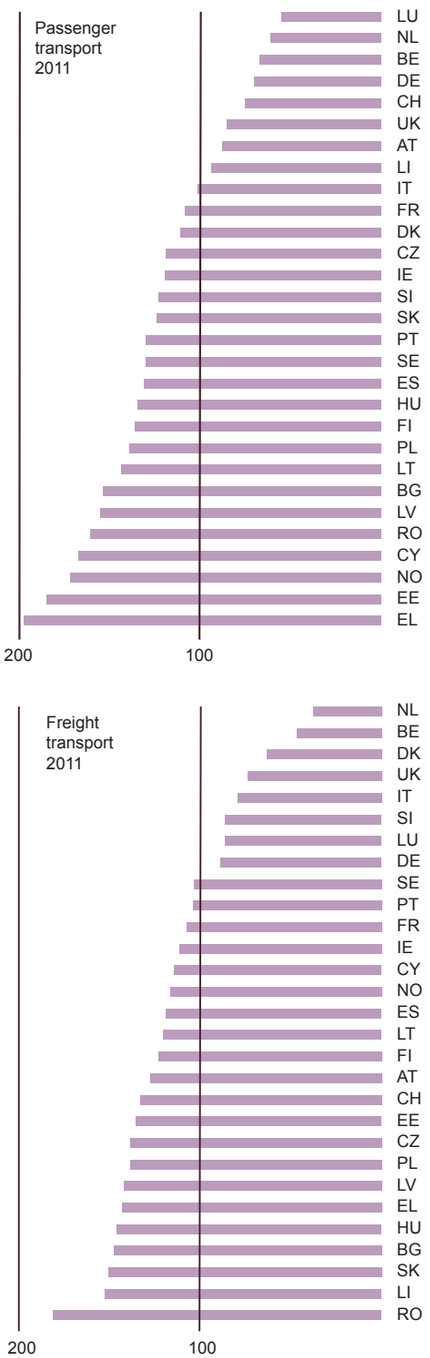
10 **minutes**

on average it takes to reach a hospital by car in Poland, but it takes 30 minutes to reach a hospital by public transport.

Availability of urban functions



Access to high-level transport infrastructure



National averages of acess to high-level infrastructure are based on regional access times and are standardised with the European average = 100

Regional level: NUTS 0 (2010)
Source: ESPON TRACC, 2013
Origin of data: MCRIT, 2013

Global and European accessibility are important location factors for economic activities. However, for the daily life of citizens, accessibility to the next regional centre, to jobs, services and public facilities or to the entrance nodes of high-level transport infrastructure may be more important than global or European accessibility.

An important endowment factor for regions is thus the access time to reach the nearest entrance nodes of higher-level transport infrastructure. For passenger transport, core areas in Europe have better access to high-level transport infrastructure than peripheral regions, as they tend to have denser motorway networks, good rail networks and concentrate most air hubs. Outside the core, national capitals and tourist regions provide areas of higher regional connectivity.

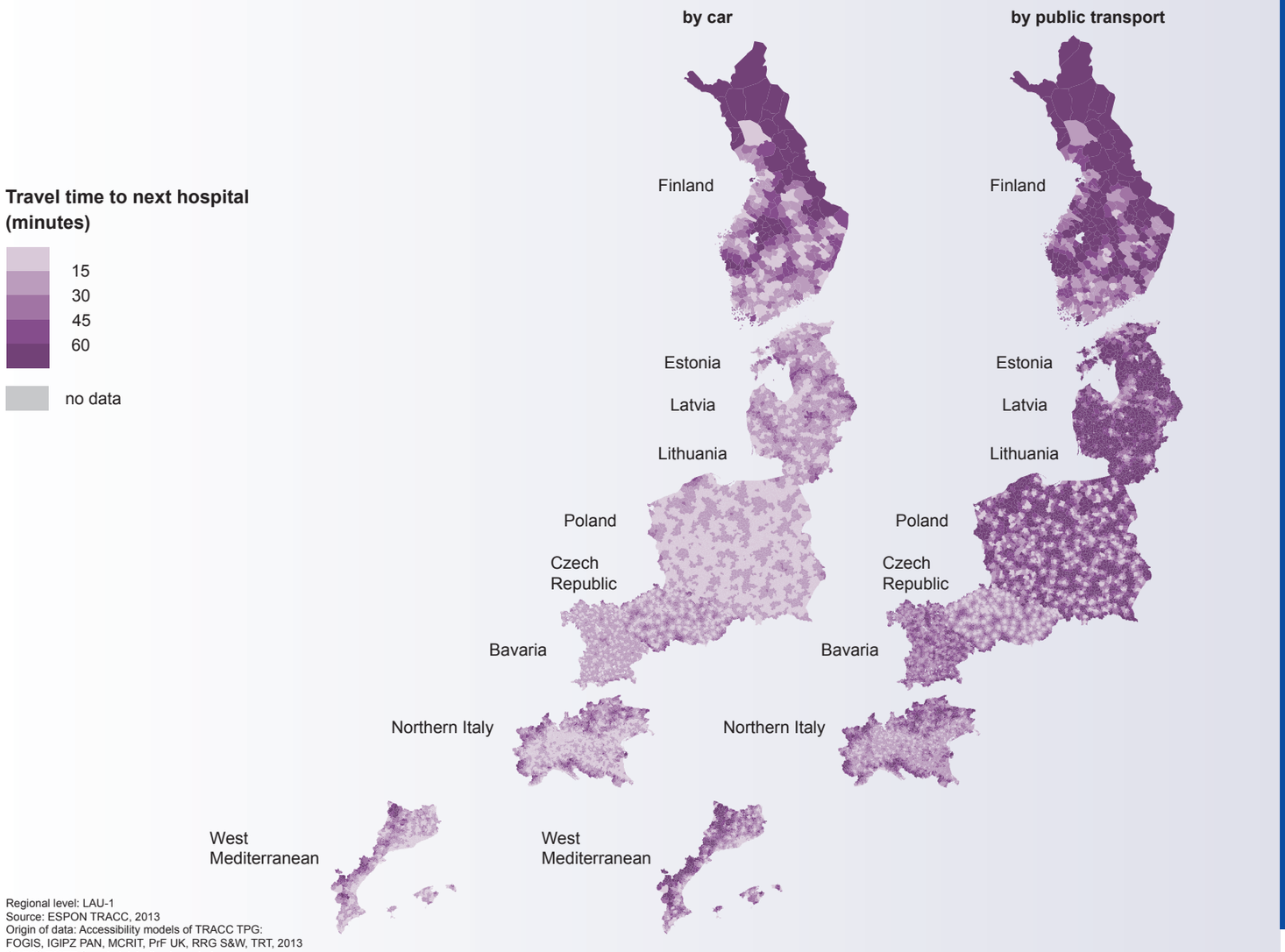
For freight transport, best connectivity is recorded in the North Sea between Benelux countries and Germany due to the presence of the largest container ports in Europe in addition to denser motorway and freight village networks. The Mediterranean rim has some large container ports as well, but has less developed transport infrastructure in the hinterland which limits connectivity of the ports.

Public and private services and functions are primarily located in urban centres. Thus, good access to urban centres is crucial for daily life of citizens and economic actors. The capacity of reaching large numbers of regional centres within limited travel time is once again highest in the core of Europe, in selected capital city regions in other countries, and in other regions such as south-western Scandinavia (e.g. Oslo-Gothenburg-Copenhagen), the Spanish Mediterranean corridor (e.g. Murcia to Barcelona), the Rhone valley, Saxony, Southern Italy, and the Upper Silesia city district. From most locations in Europe, at least one regional centre can be reached in less than 60 minutes travel time by road, but only people in western Europe have options to visit more than five different cities in that time. For rail, low accessibility values are not only located in the far North or in the Alpine space, but also inside most European countries, thus creating ‘inner peripheries’.

If the interest is mainly in the basic supply of services of general interest, such as access times to the nearest hospital or the nearest school, differences between different parts of Europe are much less pronounced. The spatial distribution of such kind of services varies more with population densities than across countries. Access to this type of services, but more substantially access to jobs, can vary strongly with the type of regions, for instance between urban, intermediate and rural regions.

A distinction between different modes of transport is clearly needed. Regional accessibility for cars and those for public transport differ to a large degree regarding absolute levels and spatial patterns. While accessibility by car tends to change only gradually over space, public transport forms corridors of higher accessibilities along certain transport axis, interrupted by areas of low accessibilities. Local and regional accessibility by car is superior to accessibility by public transport except in a few metropolitan areas.

Travel time to nearest hospital



Regional level: LAU-1
Source: ESPON TRACC, 2013
Origin of data: Accessibility models of TRACC TPG: FOGIS, IGIPZ PAN, MCRIT, PrF UK, RRG S&W, TRT, 2013

This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

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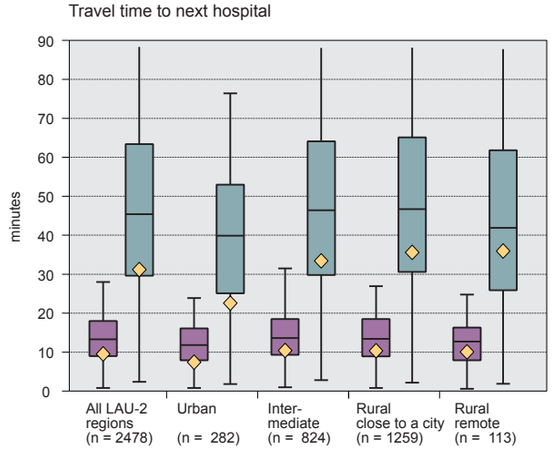
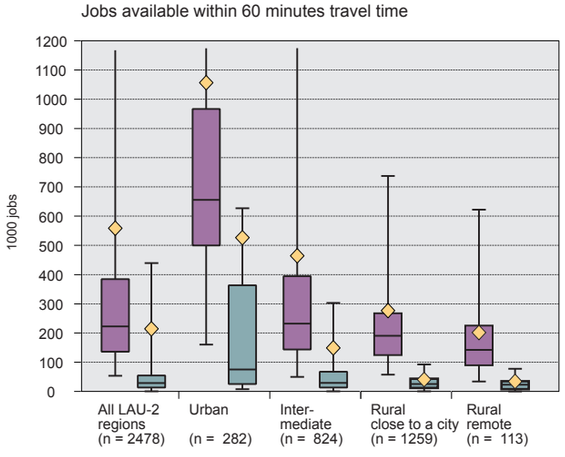
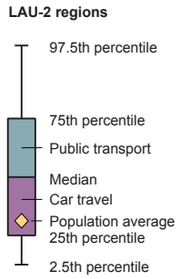
Access to services of general interest and other opportunities (case study Poland)







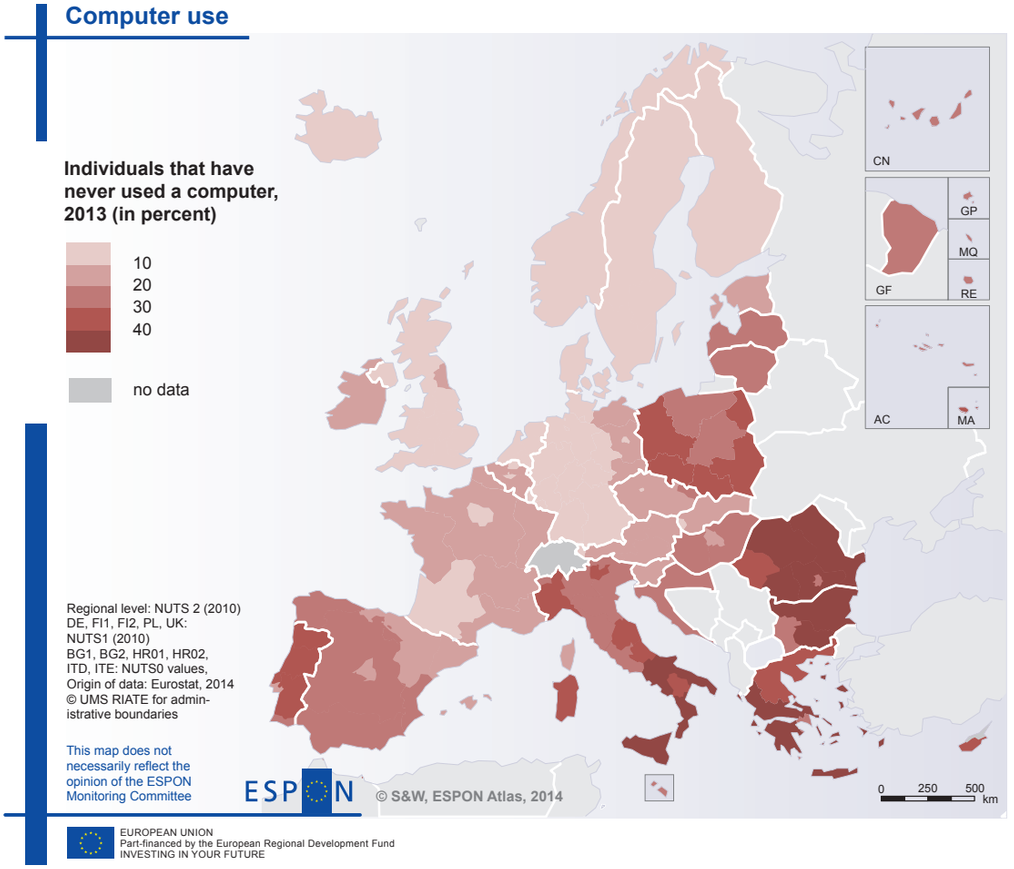
Source: ESPON TRACC, 2013
Origin of data: IGIPZ PAN, 2013

Access to information

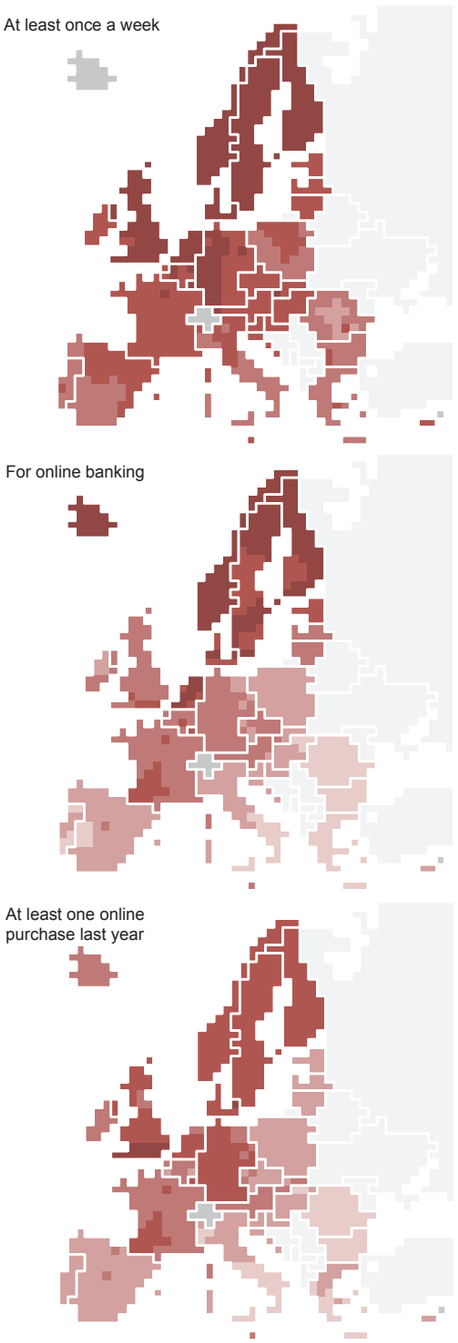
36 **percent**

of EU citizens access the internet via a portable computer or other mobile devices.

Computer use



Internet use



Source: Eurostat, 2014

Accessibility is not only about physical movement of persons or goods. Modern information and communication technologies are able to provide virtual access to resources located anywhere in the world. Ambitious objectives concerning ICT infrastructure and usage were formulated in the Digital Agenda of the European Union. These were based on the assumption that fair and affordable access via landlines or mobile phones to telecommunication networks and services will become the backbone of the European society.

However, it has been noted that computer usage (e.g. access and skills to use the Internet) is available unevenly across Europe. Whereas in countries such as the UK, Benelux, Germany or the Nordic countries almost every individual is using a computer, many people in other parts of the continent have never used a computer. Highest rates of up to more than 30 or even 40 percent of non-computer users exist in Bulgaria, Romania, Greece, and several Italian, Portuguese and Polish regions.

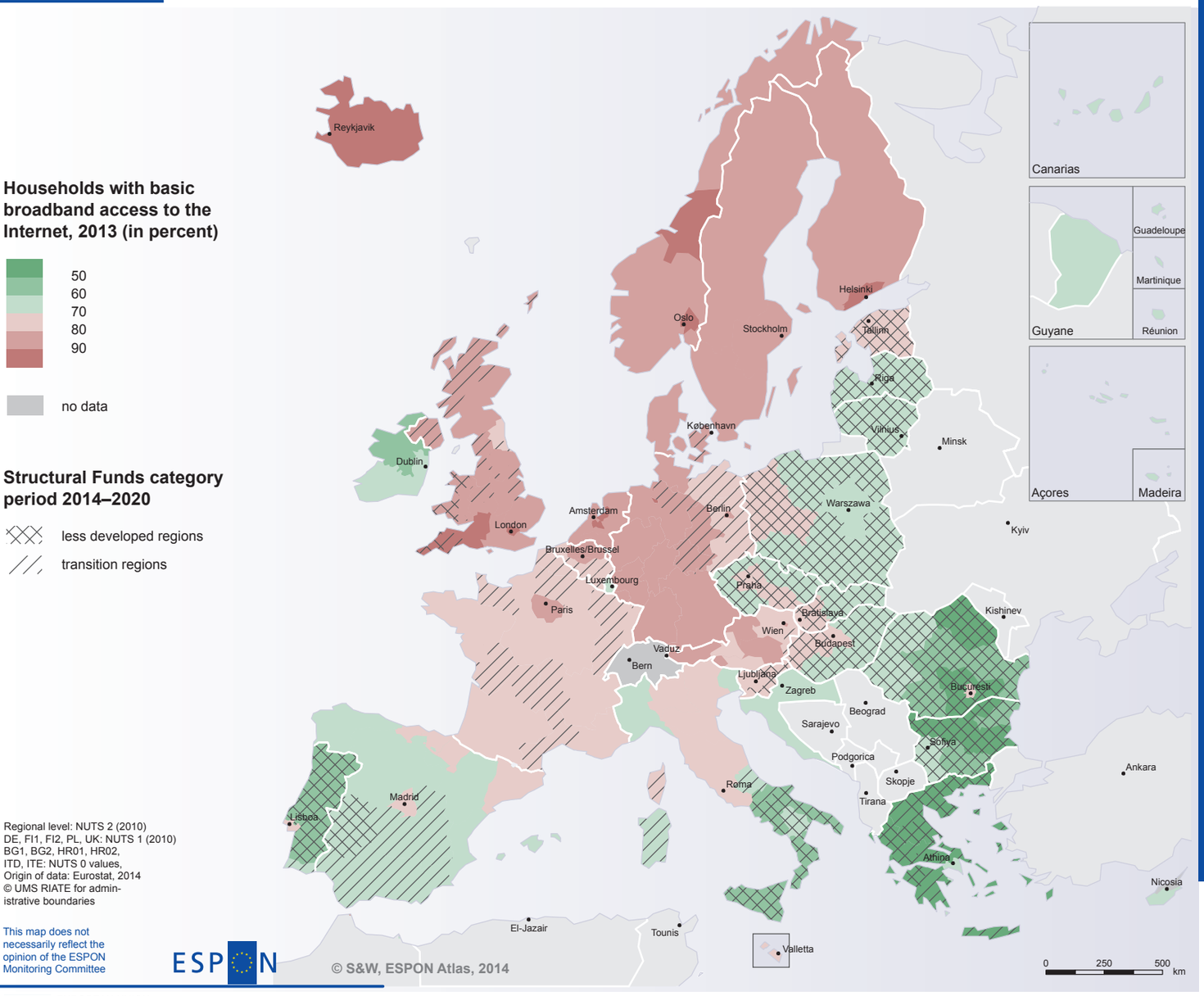
Internet use is highest in regions in which most people are able to use a computer. In most northern European regions even more than 90 percent of the population is using the internet at least once a week. Also in other countries, people that have access to a computer do use the internet, leading also to internet usage rates of at least 40 percent in Bulgarian, Romanian or Greek regions.

There is a wide spread of internet based services across Europe, but there are also wide gaps. For example, almost all people in the Nordic and the Benelux countries are using online banking; however, in Southern and East European countries online banking is much less used. In Bulgaria and Romania, online banking is almost not an option, whereas in Greece and several southern Italian regions only around 10 percent of people are doing online banking. A similar spatial pattern exists for online purchase of goods and services.

The spatial diffusion of basic broadband access is one important factor for this digital divide in Europe expressed in different degrees of usages of internet and internet services. In the Nordic and Benelux countries, the UK and Germany except eastern Germany, more than 80 percent of households have basic broadband access. The rates are much lower in Eastern and Southern Europe with lowest access rates in some regions of Bulgaria, Romania and Greece. Low regional broadband access rates coincide with the category of less developed regions in the Structural Funds (2014-2020). The gap is much wider for faster broadband, which the Sixth Cohesion Report refers to as the 'Next Generation Access'.

The current and next rounds of technological advance are following the same spatial logic across Europe. Access rates to internet through mobile phones are highest in economically more advanced countries. They are also higher in densely populated areas. In particular, the uptake of internet access through mobile phones which occurred in the last couple of years did not happen in Objective 1 and convergence regions as defined for the last funding period of the Structural Funds. Faster mobile broadband access via Long Term Evolution (LTE) 4G is again being introduced very unevenly across Europe.

Internet access



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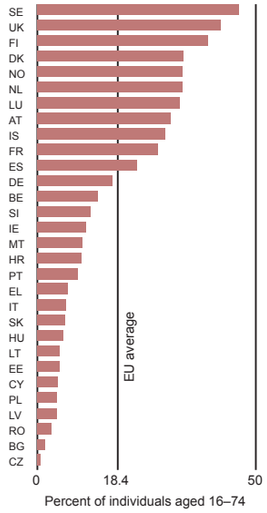
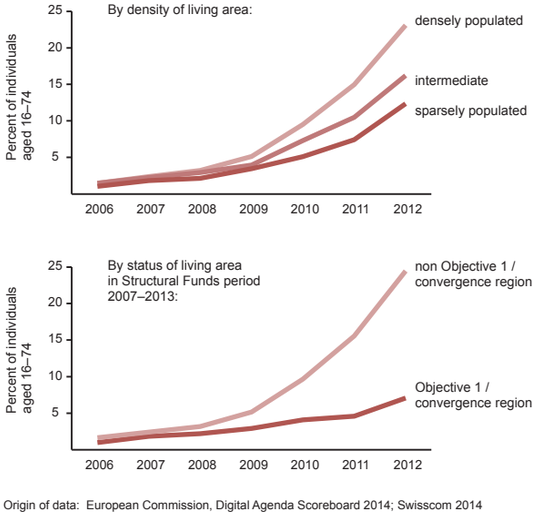
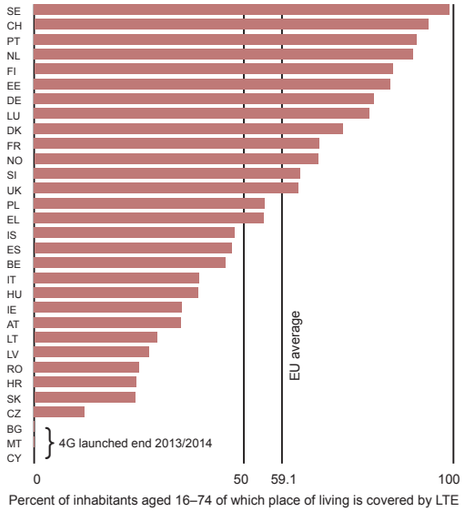
Access to Internet through a mobile phone via UMTS (3G)





Origin of data: European Commission, Digital Agenda Scoreboard 2014; Swisscom 2014

4G mobile broadband (LTE) coverage



Linkages and accessibility – territorial synopsis

Accessibility consists of two components: available activities of interest and transport infrastructure leading to them. Low accessibility values reflect in some cases sparsely populated areas and/or low service endowment, often in the European peripheries; but in others cases low accessibility values are driven by poor transport infrastructure, more often in Eastern Europe than in Western Europe.

Accessibility related policy should not only concentrate on the transport infrastructure side, as investments in the destinations, i.e. points of interest or opportunities, might be more efficient. This is also emphasised in the Sixth Cohesion Report which is stating that distances to specific destinations of interest might be reduced while at the same time increasing accessibility. That means that transport and territorial development policies should be more integrated at all territorial levels.

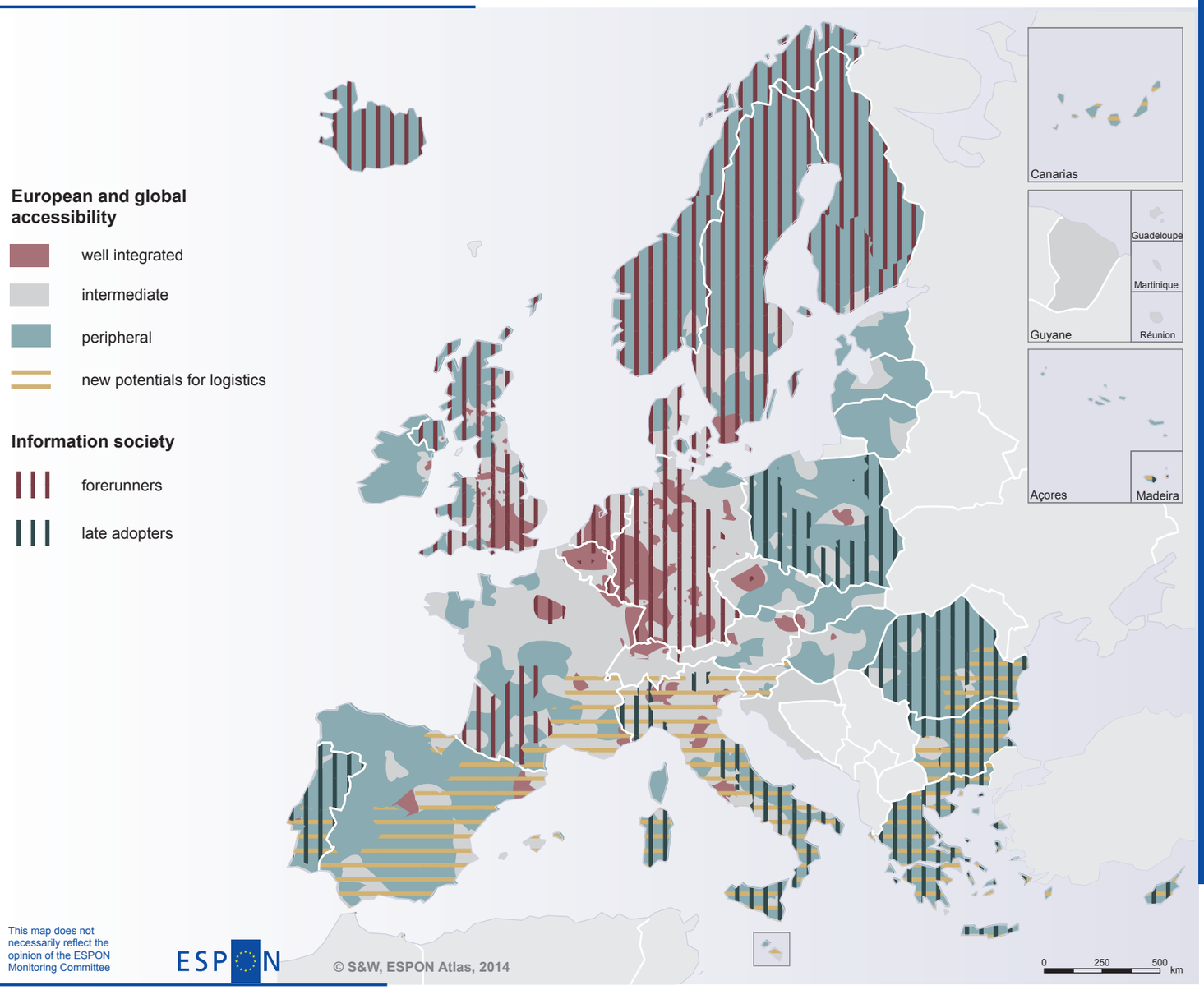
Geographical position, availability of infrastructures and services, and strength of the economy are the three key elements which describe the patterns of accessibility in Europe. These elements are correlated with each other. This means that more advanced regional economies have created favourable accessibility conditions at centrally located places. In contrast, a remote geographical position only in some cases can be substituted by other regional assets to foster economic performance.

The progressive rise of the Far East as trade partner opens to Mediterranean regions the perspective of exploiting a geographical advantage. As such, efficient multimodal infrastructures (e.g. ports, transhipment facilities, intermodal centres, roads and railways) might increase the global accessibility of Southern European regions.

The challenge for transport development is to make growth and sustainability compatible by decoupling environmental impacts from economic growth, while assuring the competitiveness and innovative character of the European transport industry. Economic crisis, limited non-renewable energy sources, ageing, migration and internal mobility, urbanisation, and globalisation of the economy are among the other challenges transport policy is facing.

Improved access to information and communication technologies is partly taking over the importance of transport accessibility. More advanced economies are creating their own comparative advantages by introducing new technologies in their regions first. At the same time, less developed regions and many towns are yet to catch up and are in need to be supported by specific territorial policies.

Linkages and accessibility – territorial synopsis



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VI. Environment and climate

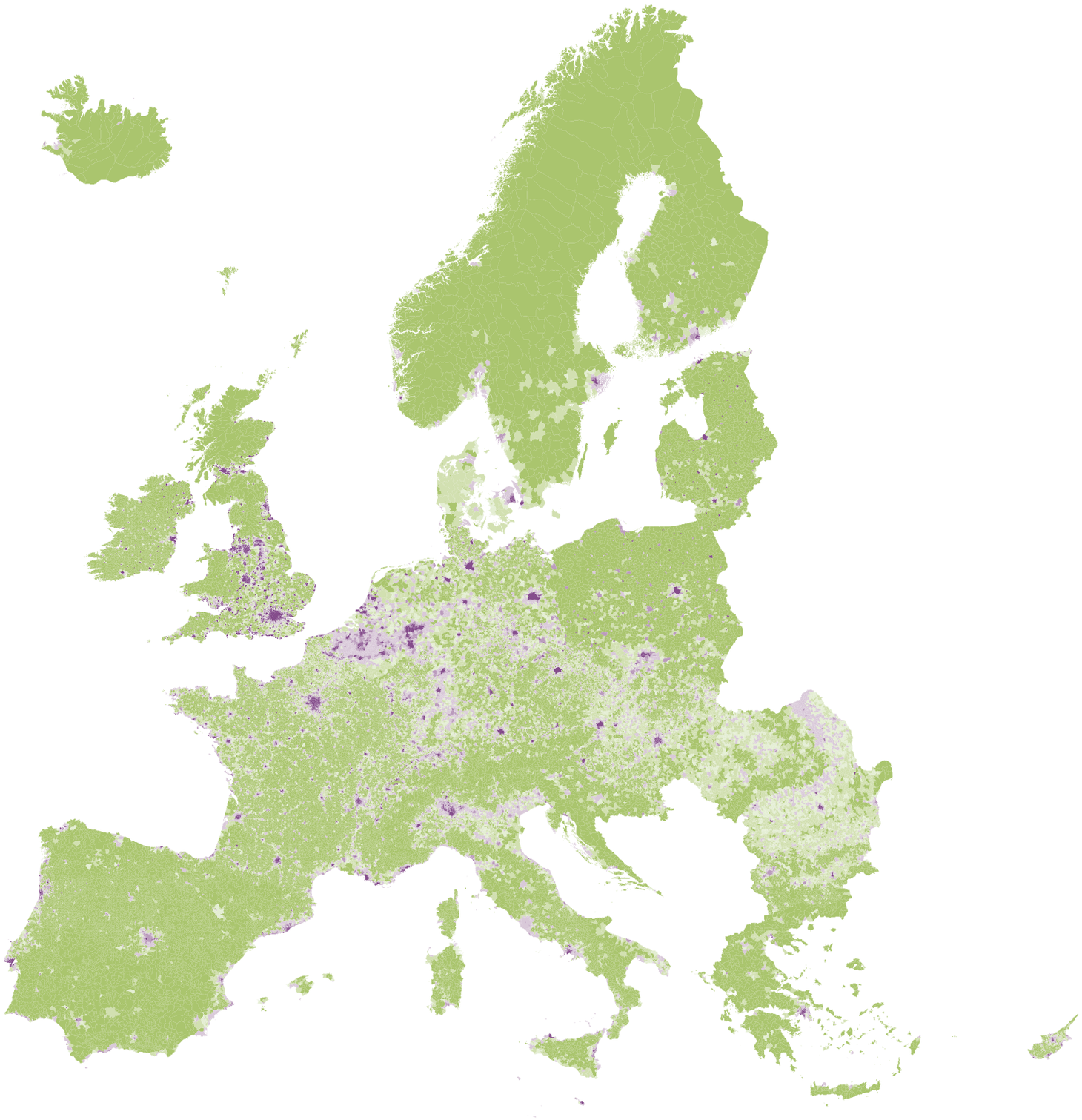
The Territorial Agenda 2020 considers risks connected with the loss of biodiversity, vulnerable natural landscape and cultural heritage. It states that ecological values, environmental quality and cultural assets are crucial to well-being and to economic prospects and offer unique development opportunities. Overexploitation of these resources to match increasing demand, as well as industrial hazards can cause serious damage and may threaten territorial development. Urbanisation, intensification of agriculture and fisheries, transport and other types of infrastructure development, particularly where they take place in a territorially uncoordinated manner, can cause severe environmental problems. Changes in land and sea use, urbanisation and mass tourism threaten cultural assets and landscapes and may lead to fragmentation of natural habitats and ecological corridors.

European policy is making increasing reference to the marine environment as integral part of territorial development. Within the marine environment, initial calls for action stemmed from growing concern that human activities were adversely affecting the maritime environment, and in turn threatening the ability of marine areas to support land based economic activity. The EU has in recent years added to these efforts through its promotion of Integrated Coastal Zone Management and developments such as the Marine Strategy Framework Directive, which seeks to ensure good environmental status of European seas. In addition, the EU's Integrated Maritime Policy and encouragement of maritime spatial planning have been influential in generating the search for more joined-up approaches. However, much still needs to be done to facilitate more integrated approaches to the territorial development of Europe's maritime regions. In addition, DG Mare, through its Blue Growth Strategy, is drawing attention to the growth potential offered by the seas and oceans.

Territorial development is generally considered as very important for dealing with climate change. For instance, territorial development is regarded to be responsible for and capable of reducing regional vulnerability to climate change and developing mitigation and adaptation capacities against the impacts of climate change. The EU White Paper on adapting to climate change (2009) explicitly requires a more strategic and long-term approach to spatial planning, both on land and in marine areas, including in transport, regional development, industry, tourism and energy policies. The Territorial Agenda asks for joint transregional and integrated approaches and strategies in order to face natural hazards, reduce and mitigate greenhouse gas emissions and adapt to climate change. Further work will be required to develop and intensify territorial cohesion policy, particularly with respect to the consequences of territorially differentiated adaptation strategies.

In line with this, the European Commission has the ambition to mainstream green economy objectives into all policy areas. These areas will include Cohesion Policy, Common Agricultural Policy, energy infrastructure and trans-European networks and climate change adaptation policies. The EU 2020 Strategy indicates that moving towards a greener economy allows for addressing environmental challenges, social inequalities as well as to create economic growth and jobs. Its flagship initiative aims at supporting the shift towards a resource efficient and low-carbon economy and at decoupling economic growth from resource and energy use. Also the Territorial Agenda 2020 emphasises the need for a shift towards greener, low carbon economic activities as a consequence from rising energy prices and emissions. These aims are supported also by the United Nations, which argues that a green economy is able to deliver progress in the social, ecological and economic dimensions simultaneously.

Non-artificial land



Share of non-artificial land (%)

50 70 90 93.3 96.6

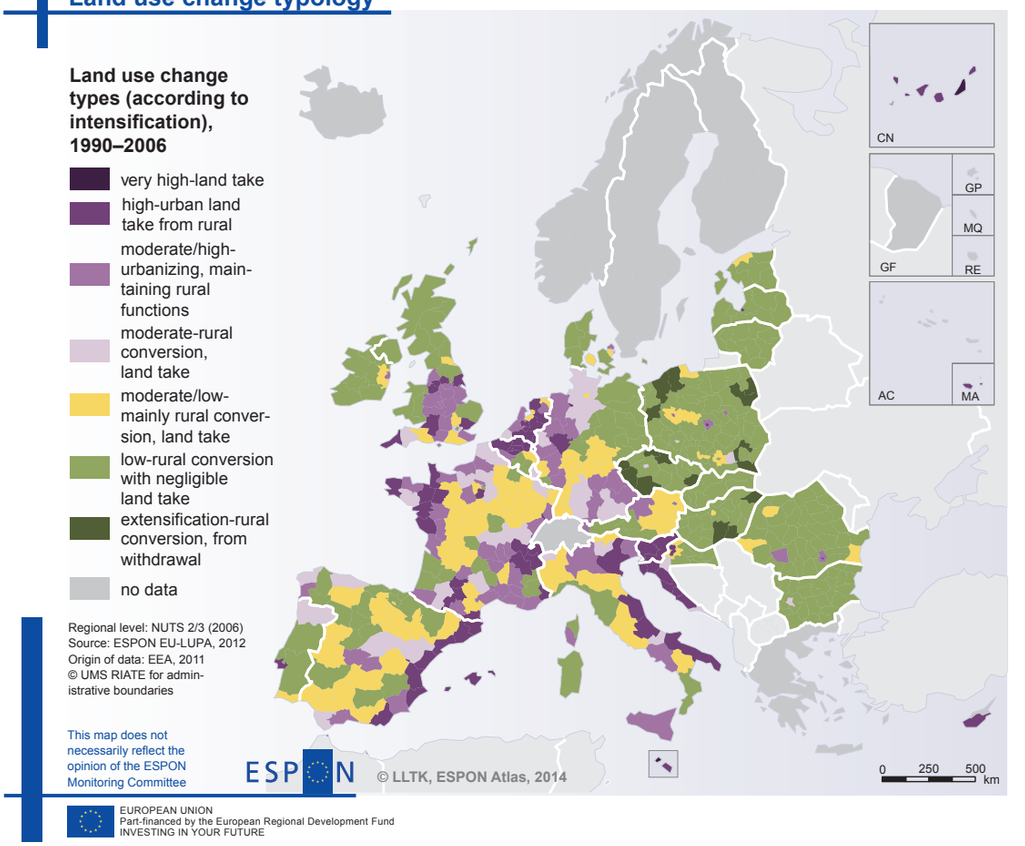
Regional level: LAU 2 (2006)
Origin of data: EEA (2014): Corine Land Cover 2006, v. 17
for GR: Corine Land Cover 2000, v. 17

Land use change

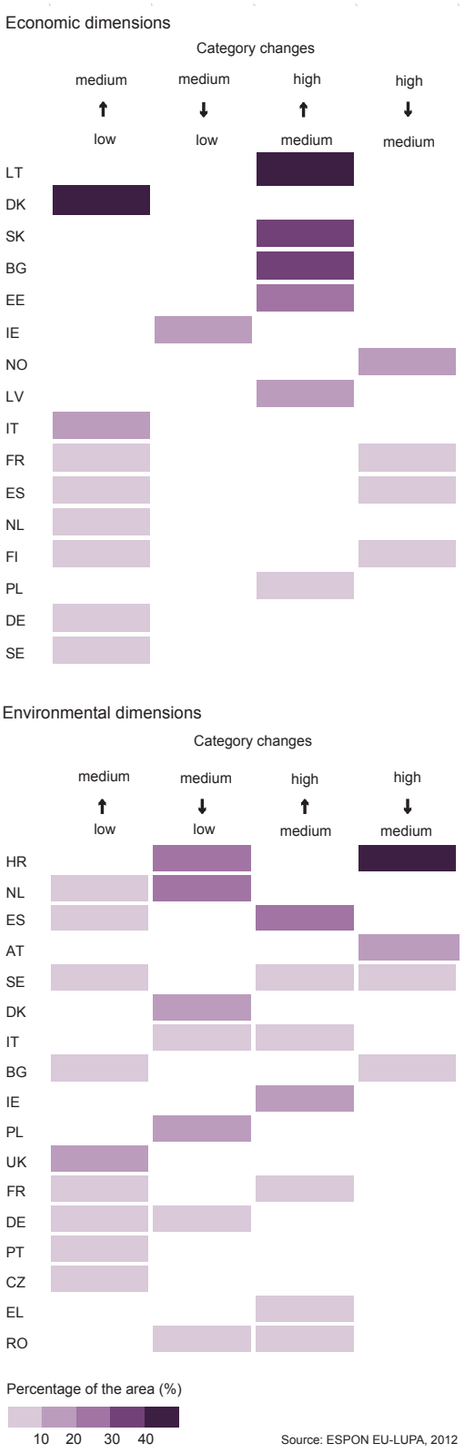
2.25 billion EUR

have been invested by Structural Funds for the rehabilitation of industrial sites.

Land use change typology



Changes in the economic and environmental dimensions in land use functions, 2000–2006



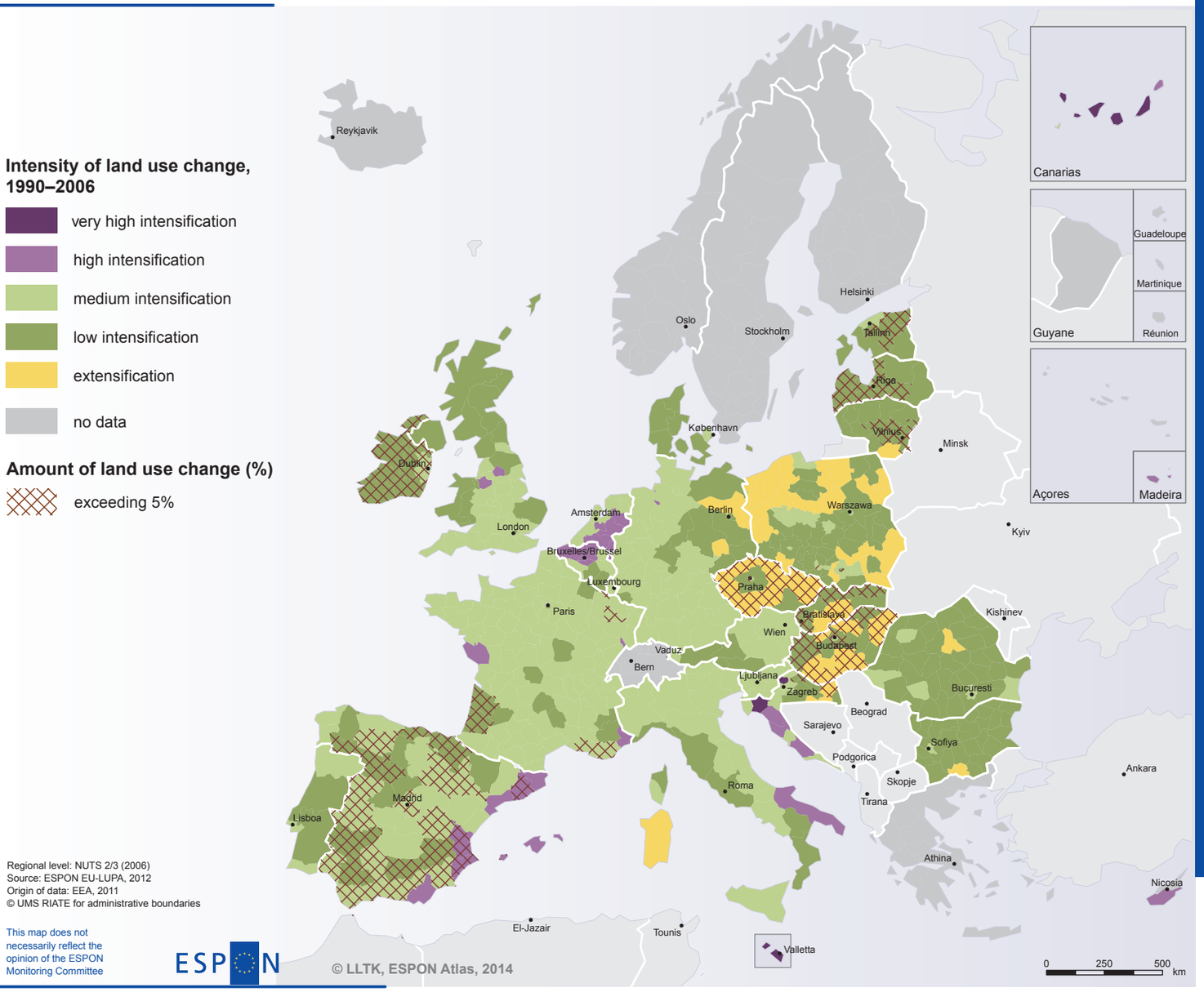
Land use in Europe has undergone robust change during the last fifty years, primarily in relation to the improvement of human well-being and economic development. Unfortunately, these changes have caused serious environmental problems. Policy change plays a role in the performance of territories. Understanding the impacts of these land use changes on sustainability is currently a major challenge for the policy and scientific community. Although European policy does not have a specific spatial planning responsibility or competence for planning per se, it sets the framing conditions of planning through different strategies and instruments.

Land use implications on the compliance with the key EU policy objectives and targets are crucial due to their cross-cutting nature. Related challenges may arise in urbanisation and rural-urban relationships, climate change mitigation and adaptation, natural resource management, energy, transport, regional competitiveness and cohesion.

ESPON results on land use provide general messages for awareness raising. The assessment of the intensity of land use change revealed that there is a clear east-west dimension that could be partly explained by the enlargement of the European Union in the 1990s. For example, large volumes of land use extensification are almost exclusively found in Central and East European member states, particularly in Poland, the Czech Republic and Hungary. This pattern is very dominant in the period 1990-2000 but continues in 2000-2006 as well. The land ownership reforms in Central and Eastern Europe during the 1990s resulted in marked changes, a process which was further fuelled by the expectations regarding future membership of the EU in the period up to and after joining the EU in 2004. It also revealed that some of the most significant changes between 1990 and 2000 took place on the Iberian Peninsula. Considering that the agrarian reforms in such regions began during the 1970s and ended in the late 1980s, the changes could be partly explained by the accession of Spain and Portugal to the EU in 1986.

When comparing the land use functions to the land use change typologies a majority of land changes (calculated by area of change) can be observed in regions where extensification is taking place due to agricultural and forest change. Urban growth comes at the expense of other land uses. In the core cities there is a clear dominance of new building development on previous agricultural land. This is due to several factors: firstly most of the available land for urban growth is agricultural; secondly, agricultural land is in most cases technically more suitable for construction than forested areas both topographically and in economic terms; thirdly, natural areas are often considered as valuable recreational areas and hence cities have protected them from construction work. Grouping cities by regions highlights some specificity. For example, in East European countries approximately 30% of construction work has been on land occupied previously by forests. In the large urban zones the agricultural land is still the primary source of urban sprawl. However, in Eastern Europe many urban developments have been built on the land previously occupied by forests.

Land use change hotspots



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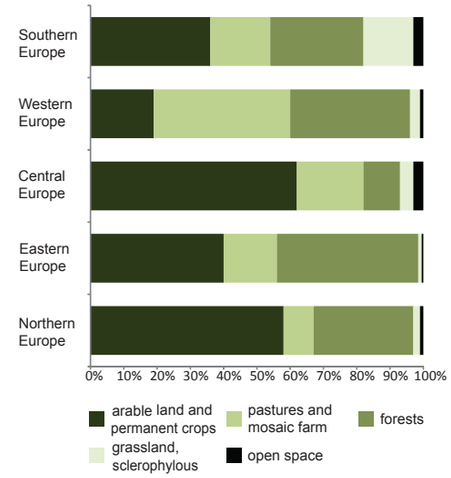
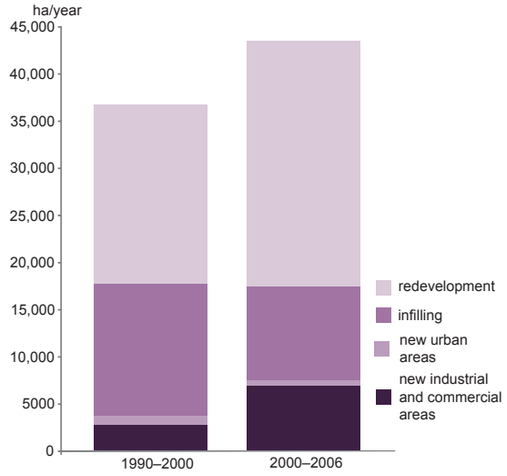
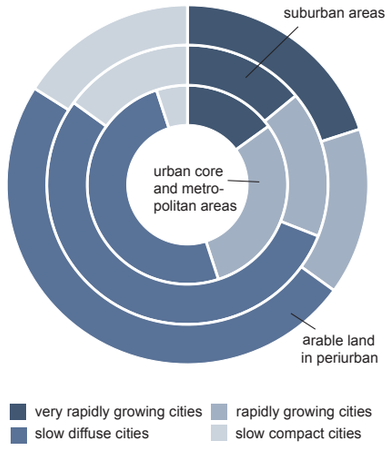
Natural and agricultural land lost due to urban development, 2000–2006



Urban development in Large Urban Zones, 1990–2006



Distribution of typology of cities in three land use classes, 2012



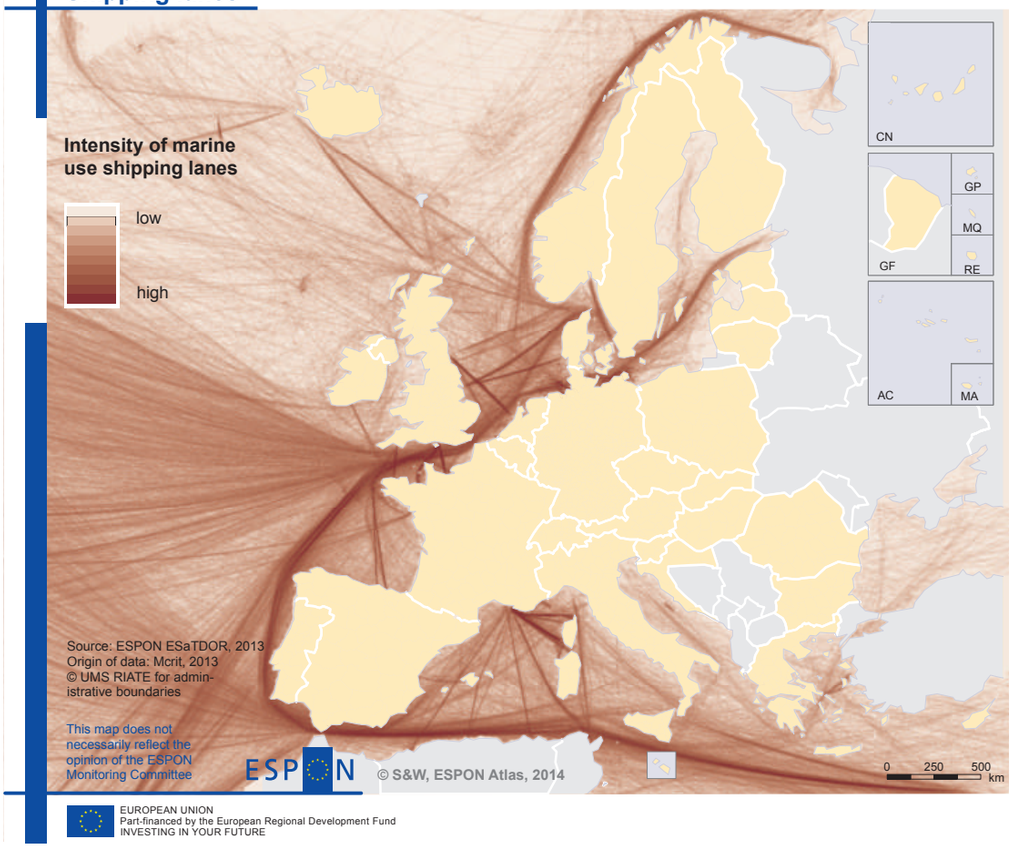
Source: ESPON EU-LUPA, 2012

Land-sea interaction

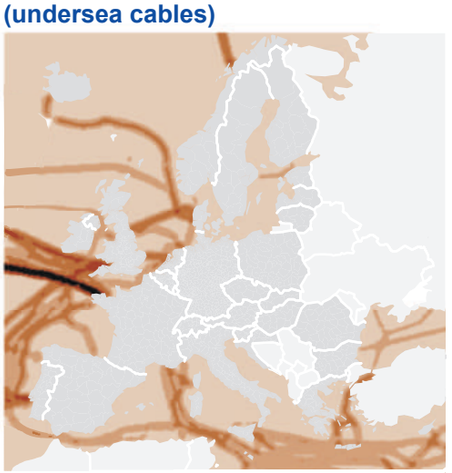
1200 **ports**

are in operation along the coasts of the European Union but most traffic is concentrated in a few major ports, most notably for freight transport at the Atlantic and the North Sea and with Italy and Greece as the leading seaborne passenger transport countries.

Shipping lanes



Information flows (undersea cables)

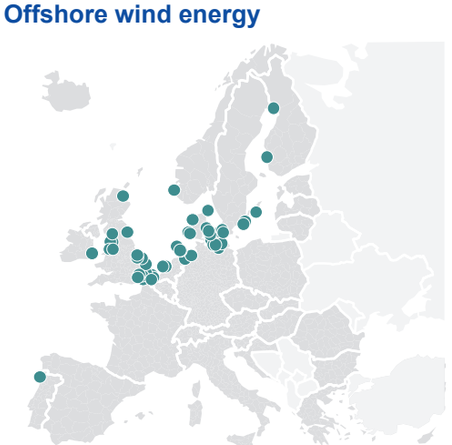


Undersea cable influence based on information flows (GB/s)

low high

Source: ESPON ESaTDOR, 2013
Origin of data: UMA and MCRIT, 2012

Offshore wind energy



off-shore wind farm

Source: ESPON ESaTDOR, 2013
Origin of data: UMA 2012

The marine environment is a critical yet undervalued component of the European Union's national, regional and local territorial space. It is not a separate entity, but a space which is inextricably linked to the land from the perspective of broader territorial cohesion. Land-sea interactions are a two-way and dynamic process, with the fortunes of marine and landward areas closely interwoven. Risks and opportunities regarding economic use of the seas are mainly connected to globalisation, climate change and overexploitation of resources.

Around 90% of EU trade with third countries passes through European ports. More than 80,000 merchant ships call at and more than 400 million sea passengers pass through European ports every year. Main shipping lanes are highlighted by the density of through traffic in the Mediterranean and heavily congested waterways around the Channel and the North Sea. Three marine network systems other than shipping are to be found in Europe's seas, all interlinking with terrestrial systems, namely electricity cables, pipelines carrying oil and gas, and submarine telecommunications cables for telephone and internet traffic.

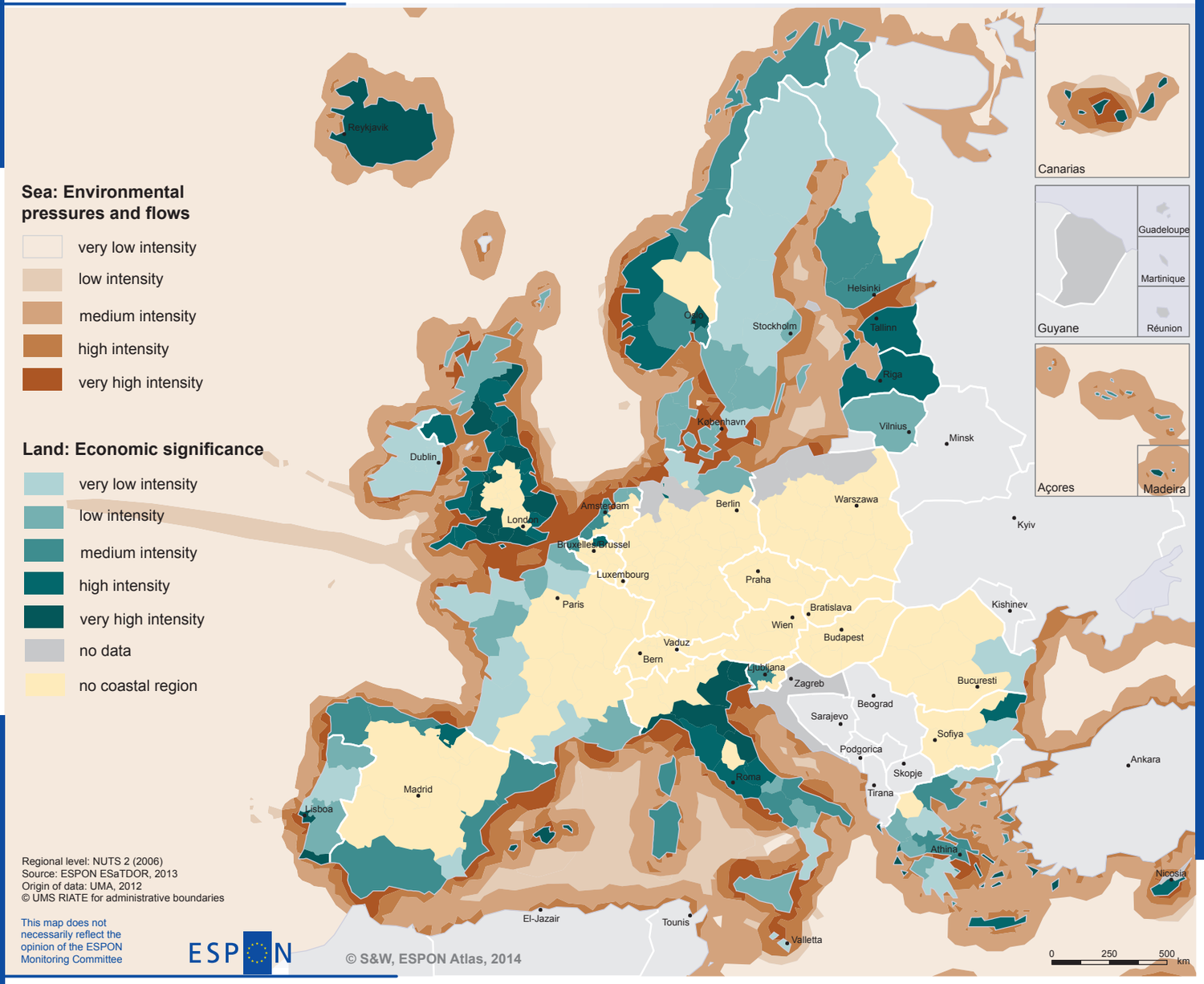
European seas are an important source of conventional energy resources for the EU. This is mainly due to the significant offshore reserves of oil and gas, especially in the North Sea, but also due to sources of renewable energies. Offshore wind farm development is centred on the southern North Sea, a second cluster is found in the Irish Sea, and a third, of smaller-scale schemes, in the south western Baltic. Together, these farms had a capacity of over 4,300 MW in mid-2012.

Environmental pressures on European seas through both sea and land-based activities are highest along major shipping corridors, around ports and at estuaries where land based organic and inorganic pollution associated with farming and industrial activity is most intense. Environmental pressures are concentrated around the Atlantic, North Sea and Baltic coastlines. Other hotspots have been identified along the northern shores of the Mediterranean and in the Black Sea.

Maritime and coastal related activities are significant for the economy of many coastal regions. This sector accounts for 20 to 35 percent of total employment in Iceland, Norway, Estonia and Latvia, the UK, parts of northern Spain, southern Portugal, northern and central Italy, parts of Greece and many European islands. These areas are where local economies appear to be most strongly related to their maritime setting.

ESPON typologies are usually land-based and do not adequately capture uses of maritime space or land-sea interactions. However, a maritime region typology around economic activity, environment and flows was developed that indicates the intensity of land-sea interactions. The maritime region types range from the 'European Core', where land-sea interactions are at their most intense, to 'Regional Hubs' which are home to important maritime clusters. Furthermore, there are 'Transition Areas' with some significance of land-sea interactions, 'Rural Areas' with low levels of human use and 'Wilderness' with the Arctic representing the only true wilderness region in Europe.

Intensity of land-sea interactions



Regional level: NUTS 2 (2006)
Source: ESPON ESaTDOR, 2013
Origin of data: UMA, 2012

This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

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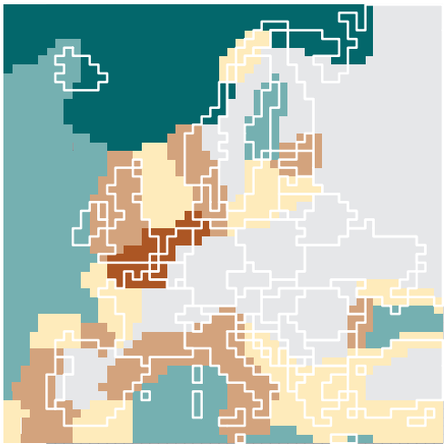
Environmental pressure

low — high

Composite assessment based on incidence of invasive species, organic pollution (pesticides) and inorganic pollution (fertilisers)

Source: ESPON ESaTDOR, 2013
UMA, 2013

Typology of maritime regions



wilder-ness | rural | transition | regional hub | European core | not maritime

Source:ESPON ESaTDOR, 2013

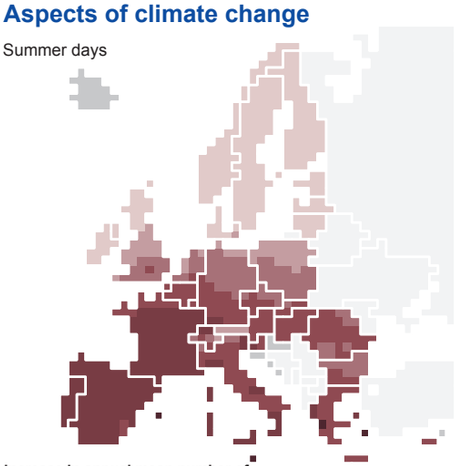
Climate change

4.1 degrees Celsius

is the highest increase in mean annual temperature in European regions projected for 2071/2100 compared to 1961/1990.

Aspects of climate change

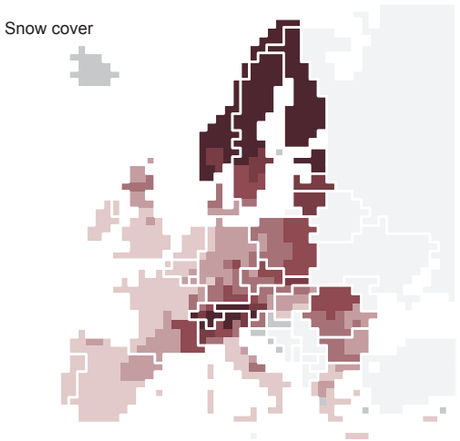
Summer days



Increase in annual mean number of summer days, 2071/2100 v. 1961/1990

10 20 30 40 50 no data

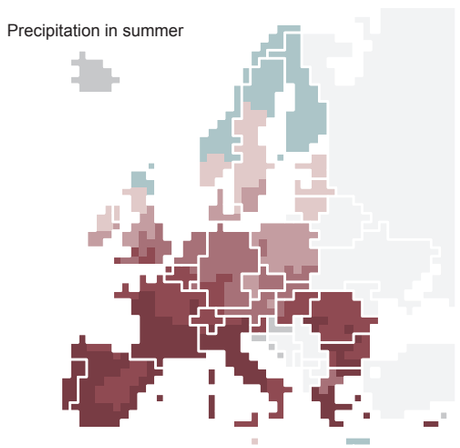
Snow cover



Decrease in annual mean number of days with snow cover, 2071/2100 v. 1961/1990

5 10 20 30 50 no data

Precipitation in summer

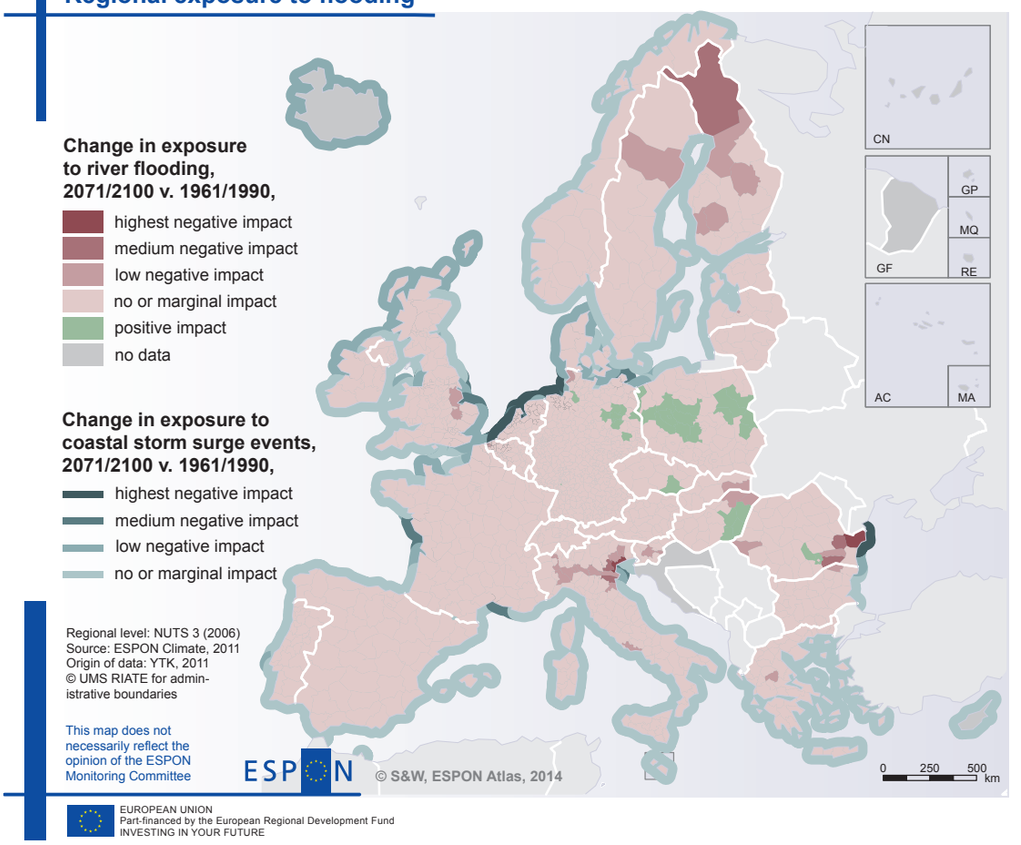


Change in annual mean precipitation in summer months (in percent), 2071/2100 v. 1961/1990

-40 -30 -20 -10 0 no data

Source: ESPON Climate 2011, IRPUD 2011

Regional exposure to flooding



Rising anthropogenic greenhouse gas emissions contribute to global warming and thus to climate change. Projected changes are based on one of the economic development oriented scenario (A1B) of the Intergovernmental Panel on Climate Change (IPCC). The anthropogenic contribution runs in parallel to natural climate variability. The resulting climate changes differ between regions; each region has a different exposure to climate change. In addition, each region has distinct physical, environmental, social, cultural and economic characteristics which result in different sensitivities to climate change. Both exposure and sensitivity determine the possible impact that climatic changes may have on a region. However, a region might in the long run be able to adjust, for example by increasing its dikes. This adaptive capacity enhances or counteracts the climate change impacts and thus leads to a region's overall vulnerability to climate change.

Territorial development is very important for dealing with climate change. It is considered to be responsible for and capable of reducing regional vulnerability to climate change, and of developing climate mitigation and adaptation capacities against the impacts of climate change. Mitigation is highly relevant for territorial development and cohesion since climate policy implementation and the transition to a low-carbon society will have differential effects on sectors and regions. However, mitigation measures, even implemented at the regional level, will not have significant effects on regional climate but contribute to an overall reduction of global climate change.

Climate change exposure refers to the nature and degree to which a system is exposed to climatic variations. This exposure depends on global trends of climate change and - due to spatial variations - on the system's location.

The number of summer days, for example days with maximum temperature above 25°C, is expected to increase all over Europe. The slightest increases with less than 10 days per year are predicted for the North of Europe including Scandinavia, Finland, the Baltic States as well as parts of Denmark, UK and Ireland, while most of France, Spain and Portugal exhibit increases of more than 40 days per year on average.

Another impact is the strong reduction of annual mean numbers of days with snow cover. The impact is largest in regions with longer periods of snow cover. Most significant decreases with 40 to more than 50 days less of snow cover are projected for Scandinavia, Finland, the Baltic States and the Alpine region. Next to these regions some parts of Eastern Europe are also projected to experience comparatively strong decreases in the number of days with snow cover. Other parts of Europe will be less affected.

Expected changes in precipitation in summer months again are twofold. While the most northern parts of Europe are projected to have increases, most of the European regions will experience significant reduction in summer precipitation. France, Portugal, Spain, Italy and Greece will have the strongest relative decreases in annual summer precipitation of up to 40 percent or more.

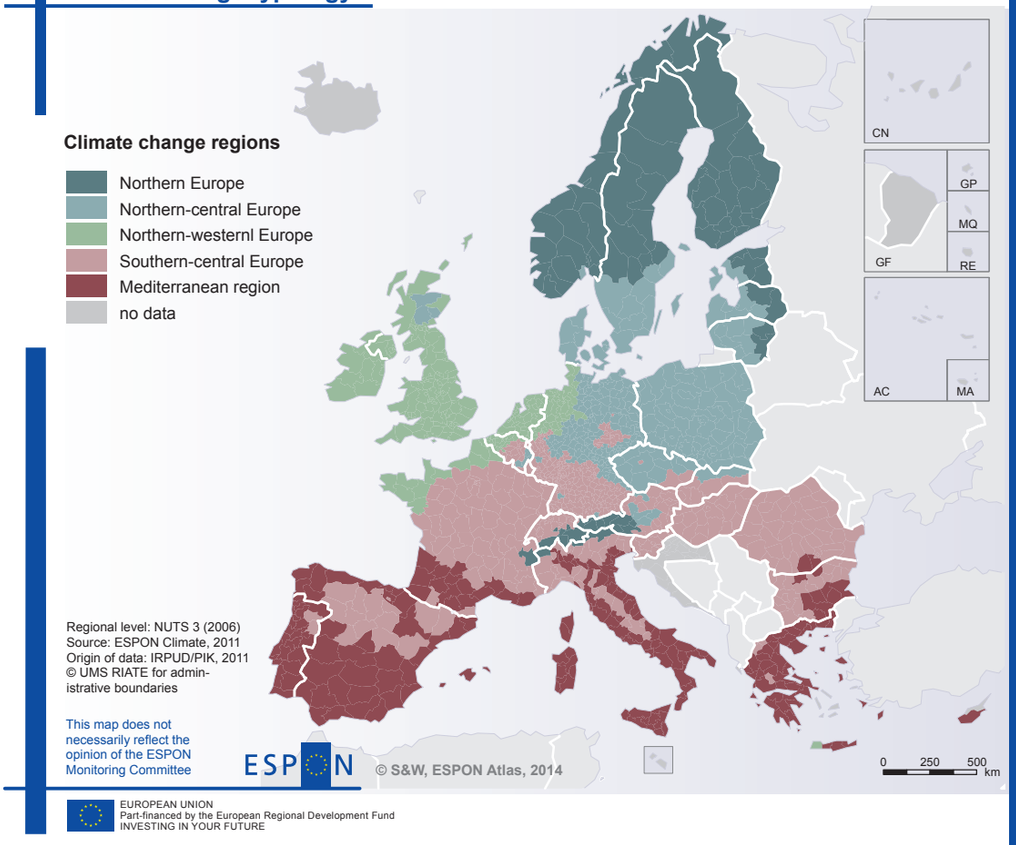
The effects of climate change constitute a culmination of several individual impacts. Changes of inundations through river flooding and through coastal storm surges based on projected sea level rise belong to such effects. However, only some regions are at risk for a 100-year return event in river flooding towards the end of this century, but for most regions risks are marginal. Among the areas characterised by considerable increases in river flooding are regions located in the Nordic countries and in northern Italy. Also some regions in the UK, Ireland, Hungary and Romania will be quite severely affected. Corresponding to the precipitation patterns there are also some regions projected to experience decreases in exposure to river flooding, predominantly in eastern parts of Germany and in Poland and Hungary. For most coastal regions risks of inundated areas as a combined effect of sea level rise and storm surge heights of a 100-year return event are relatively low. However, for some regions at the Dutch and German coastlines but also in Denmark, France, north-eastern Italy and Romania more severe changes can be expected.

A typology of climate change regions was developed by performing a series of cluster analyses on the basis of different climate variables. Five clusters were identified each exhibiting distinct regional climate change profiles. A strong increase in mean temperature is observable for three clusters, namely 'Northern Europe', 'Southern central Europe' and the 'Mediterranean region'. Strong decreases in frost days predominantly characterise the clusters of 'Northern central Europe, 'Northern Europe' and 'Southern central Europe', whereas strong increases in summer days is projected for the clusters of 'Southern central Europe' and the 'Mediterranean region'. Change in precipitation in winter months in the 'Northern Europe' cluster shows particularly strong increases while for summer months most significant changes in terms of strong decrease can be observed in 'Southern central Europe' and 'Mediterranean region' clusters. The variables heavy rainfall and evaporation do not show very strong changes for any of the clusters while days with snow cover are projected to decrease strongly in the 'Northern central Europe' cluster.

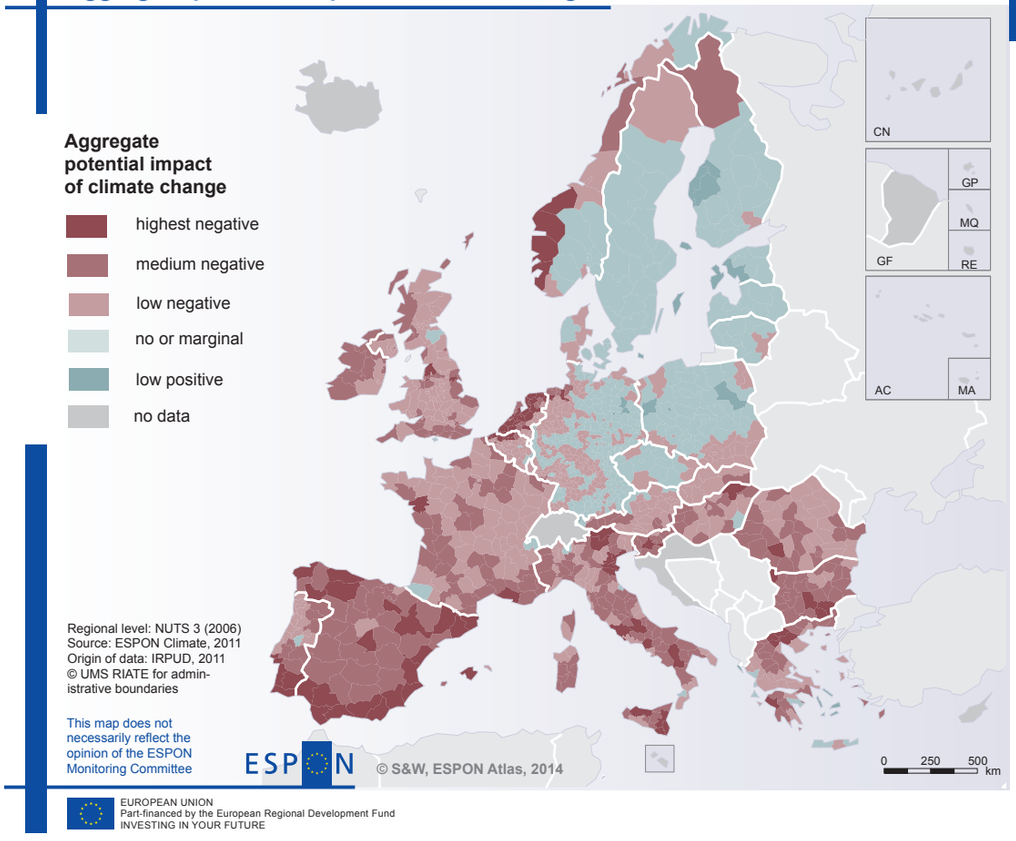
According to the Intergovernmental Panel on Climate Change (IPCC), impacts are consequences of climate change on natural and human systems. The pattern of impacts of climate change on Europe's regions can be seen as evidence for adaptation needs: the higher the potential negative impacts, the more important is adaptation in order to avoid negative consequences on the economy, population, physical assets, cultural heritage and the environment.

The potential impact of climate change on Europe's regions differs considerably. Hot spots are mostly located in southern Europe. However, other specific types of regions such as some mountain areas or the densely populated Dutch coastline are particularly affected. However, these areas may be affected due to other factors such as sea level rise or economic dependency on summer and/or winter tourism. There seems to be a moderate negative impact in some remote northern areas resulting from the sensitivity of the environment and flood-prone infrastructure.

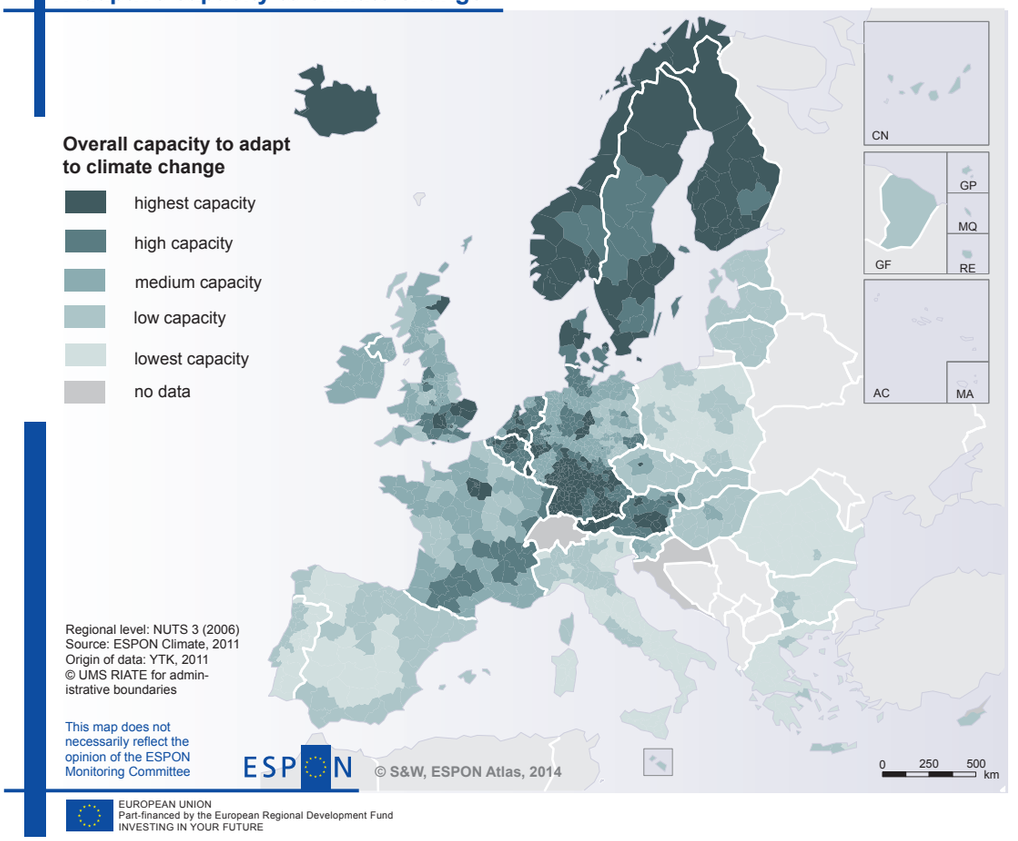
Climate change typology



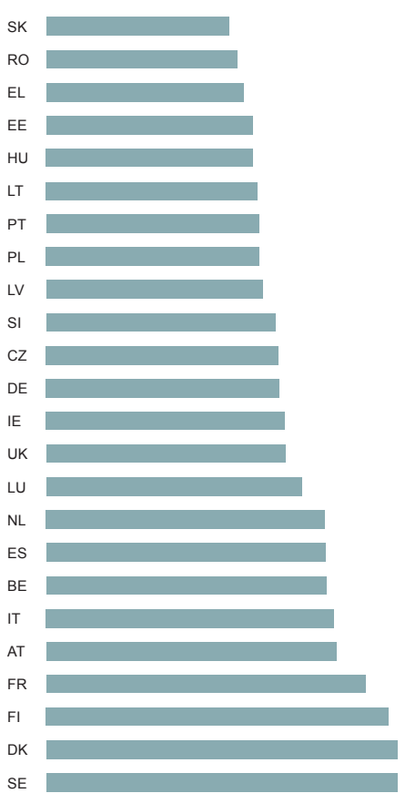
Aggregate potential impact of climate change



Adaptive capacity to climate change



Mitigation capacity related to greenhouse gas emissions



Source: ESPON CLIMATE, 2011
Origin of data: IRPUD, 2011

Adaptive capacity is defined as the ability or potential of a system to respond successfully to climate variability and change, and includes adjustments in both behavior and in resources and technologies. A system's adaptive capacity is mostly determined by a local set of resources and conditions that constrain or facilitate the ability of the system to successfully adapt to changes in climate. Adaptive capacity consists of three elements: awareness, ability and action, which are further comprised of individual dimensions.

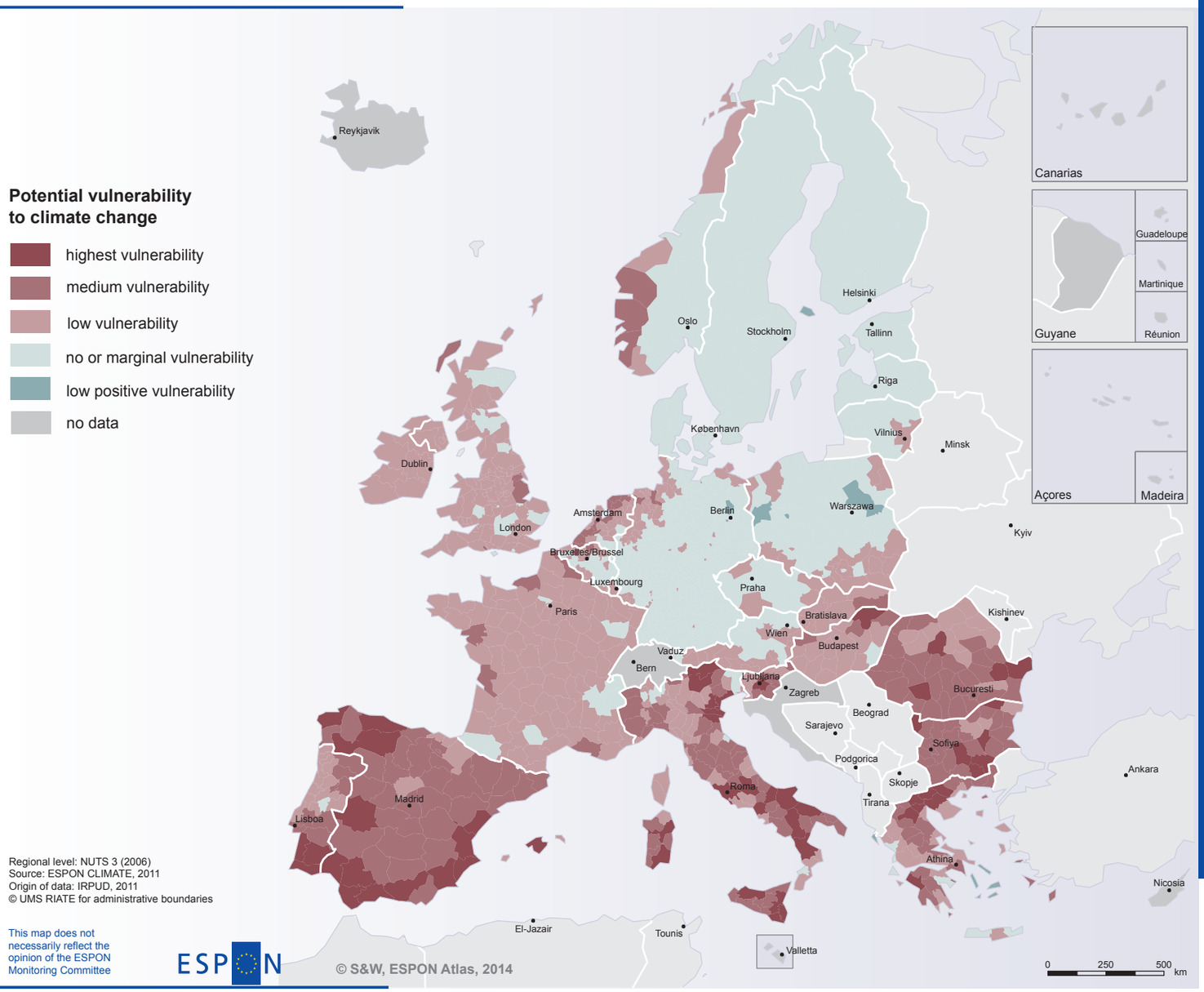
In general aggregate terms, Nordic countries have a higher adaptive capacity than most of southern European countries. Eastern European countries, on the whole, have lower adaptive capacity than western or northern European countries. Overall, the countries around the Mediterranean appear to have lower adaptive capacity than the countries around the Baltic Sea region.

Vulnerability is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, which includes its sensitivity, and its adaptive capacity. Vulnerability is thus the result of combining climate variation and sensitivity and adaptive capacity.

The spatial patterns of the potential vulnerability of Europe's regions to climate change looks slightly different compared with the map on aggregate impact. The south-north gradient which was already visible on the aggregate impact map is now even more obvious. This is due to the considerable adaptive capacity of Scandinavia and western European countries which lowers the potential impact projected for these regions. Particularly those countries for which a medium to high negative impact is projected seem to be less able to adapt than others for which the severity of the problem is less visible. Consequently, a medium to high vulnerability may be expected in the Mediterranean region, but also in south-eastern Europe.

This expectation runs counter to territorial cohesion. Climate change would trigger a deepening of the existing socio-economic imbalances in Europe. Eastern Europe is also affected by demographic changes which may lead to an additional increase in sensitivity and therefore impact. At the same time this would also decrease Eastern Europe's adaptive capacity, since a growing ageing population makes the whole population more sensitive and less capable to adapt. Territorially differentiated adaptation strategies seem to be important primarily for tourist resorts in the Mediterranean region, but also in the Alps. This is because both types of regions are identified as particularly vulnerable. Moreover, agglomerations mainly in the South are vulnerable for several reasons. For example, from a long-term perspective, urban heat poses not only a risk for human health, but also leads to additional energy demand for cooling; it can also lead to frequent power failures.

Potential vulnerability to climate change



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Potential vulnerability to climate change by country

Source: ESPON CLIMATE, 2011
Origin of data: IRPUD, 2011

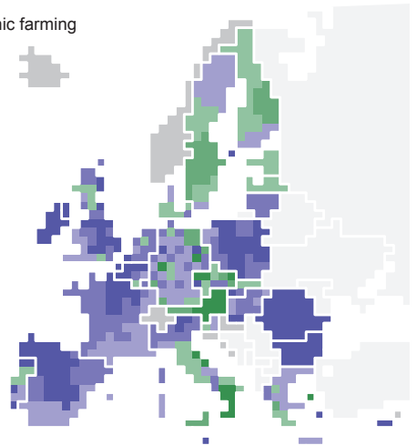
Greening of the economy

4.2 million full time equivalents

is the estimated employment in the EU in the environmental goods and service sector in 2011.

Facettes of the green economy

Organic farming

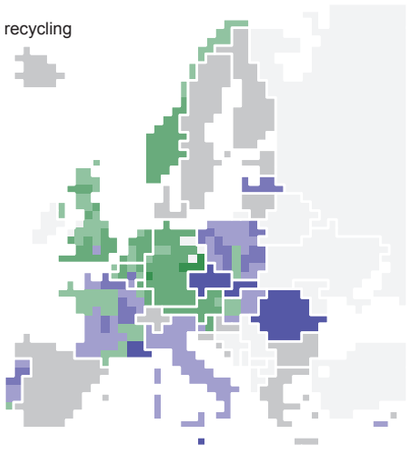


Organic farming in percent of utilised agricultural area, 2007

1 2.5 5 7.5 10 — no data

Source: DG AGRI, 2011

Waste recycling

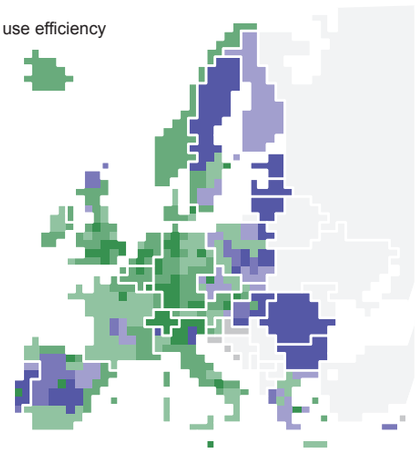


Municipial waste recycling ratio in percent, 2009

5 10 15 25 50 — no data

Source: Eurostat 2013

Land use efficiency

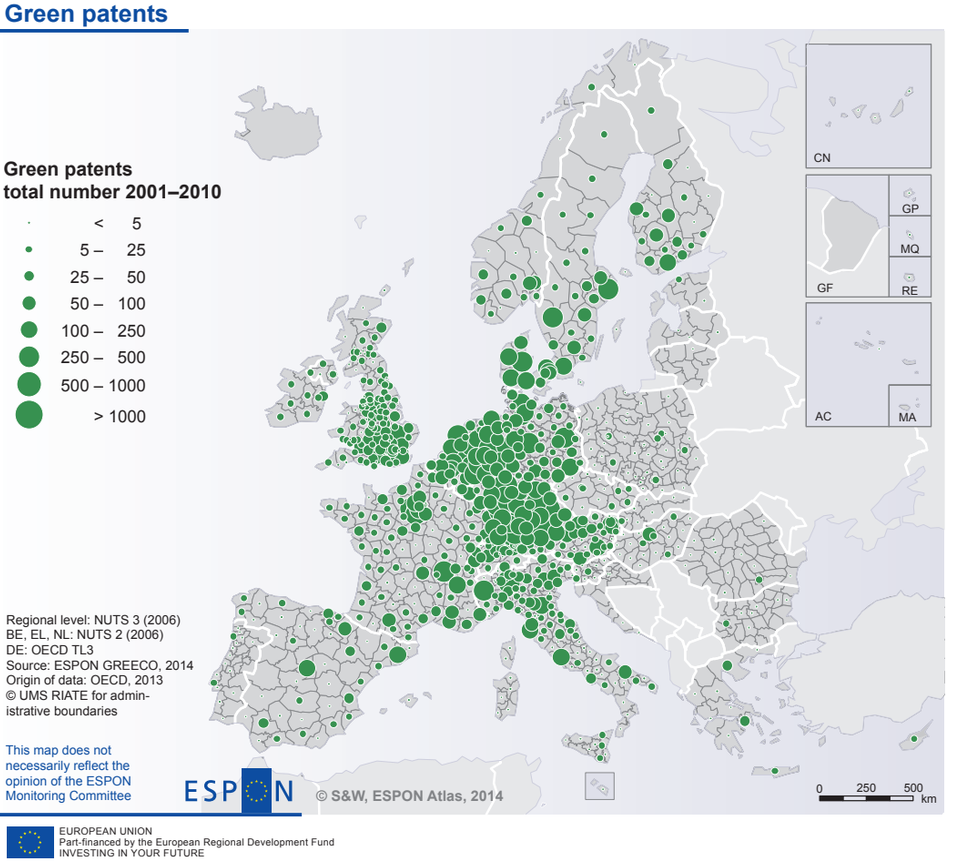


Artificial land area (ha) per million Euro of GDP, 2009

1 2 3 4 5 — no data

Source: Eurostat 2013

Green patents



Green economy is about enhancing regional competitiveness and territorial cohesion through more sustainable use of natural resources, preservation of environmental capital and fewer environmental risks. The green economy is a political rather than a scientific concept.

From an analytical point of view, the green economy is difficult to grasp. The environmental goods and services sector (EGSS) comprises only those production activities that generate environmental products (i.e. products that have been produced for the purpose of environmental protection or resource management). Employment in EGSS saw a steady growth from 3.1 million to 4.2 million during the last decade and accounts now for around 2 percent of EU employment.

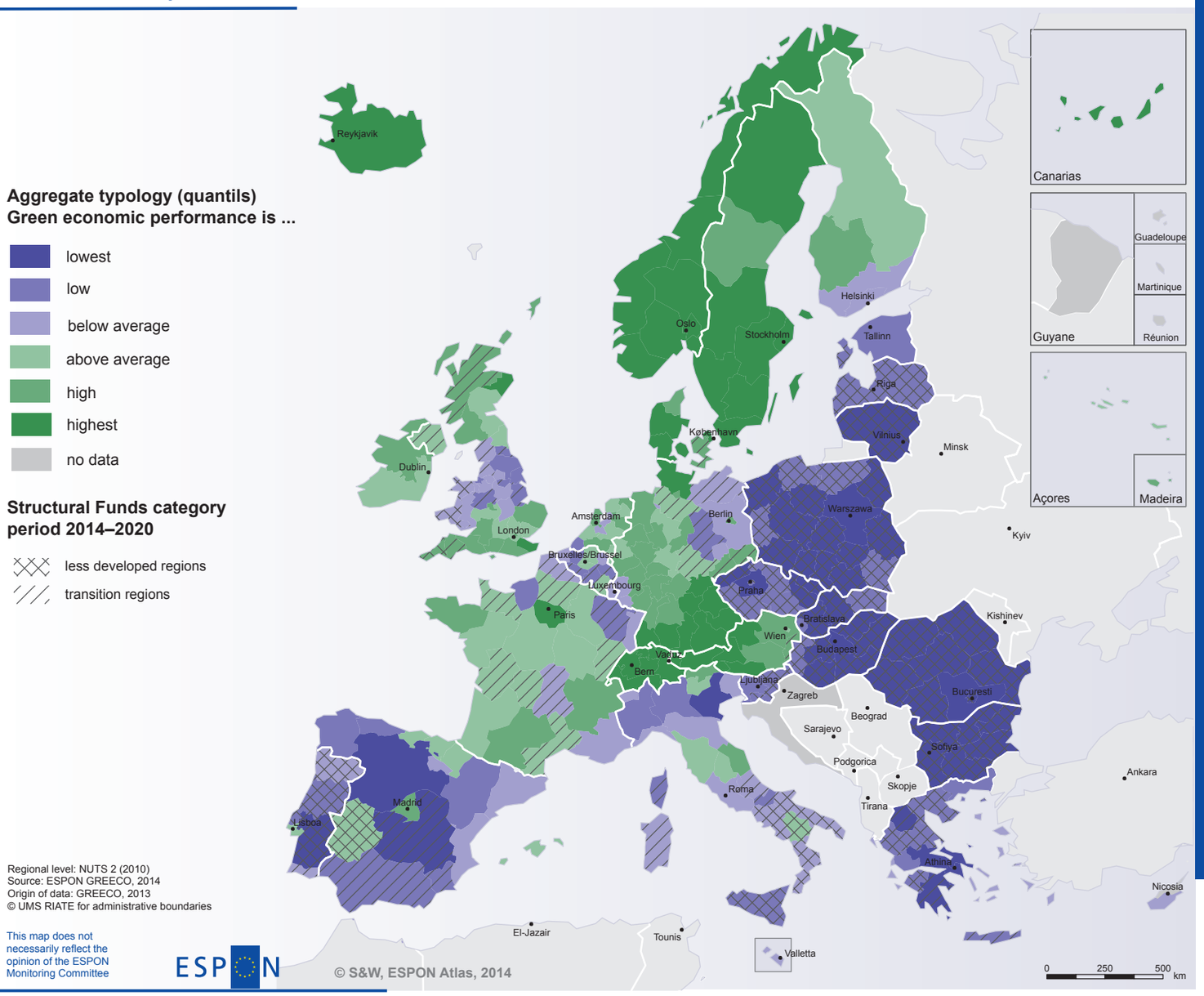
According to the prevailing political concepts a broader view to analyse regional green economic performance identifies five core dimensions. These are labelled as spheres of green economy, the territorial sphere, the economic sphere, the environmental sphere, the social sphere and the econosphere - which takes account of the extent to which decoupling of economic growth from energy consumption and resource depletion is taking place.

Not all regions in Europe perform equally as regards the green economy. Nordic and Alpine regions have a high performance in the environmental sphere, as an outcome of high environmental and natural assets combined with low emission levels. Their picture is similar on the territorial sphere, as a result of high level of production of renewable energy and high land productivity, and on the econosphere, as they have a high economic output per energy unit used. On the other hand, Southern European regions suffer from high exposure to air pollution and Eastern European regions from low life expectancy. This explains the low performance of these regions in the social sphere. The economic sphere identifies considerable differences in Europe. Southern Germany, Denmark and some other individual regions are doing best. In those parts of Europe, the development of green technologies plays a larger role in the regional economy than elsewhere. At the same time, green products and services are offered in those countries by a higher share of small and medium enterprises than in other countries. A large gap exists compared to most other regions in which the performance is rather low.

Countries with high and very high overall green economic performance are mainly the Nordic Countries, Switzerland, Austria and Ireland. Furthermore, single regions located in the Netherlands, Italy, Germany, UK, France and Spain, including Paris and Madrid are performing well. On the other hand, most Eastern European regions often have a very low green economic performance because the performance in several of the five different spheres is below average.

The degree of regional green economic performance is closely related to the economic development status. Unsurprisingly, lagging regions are low performers in green economic aspects, whereas prosperous regions are performing better. It seems that a certain degree of economic output is required to be able to put also an emphasis on green issues.

Green economic performance



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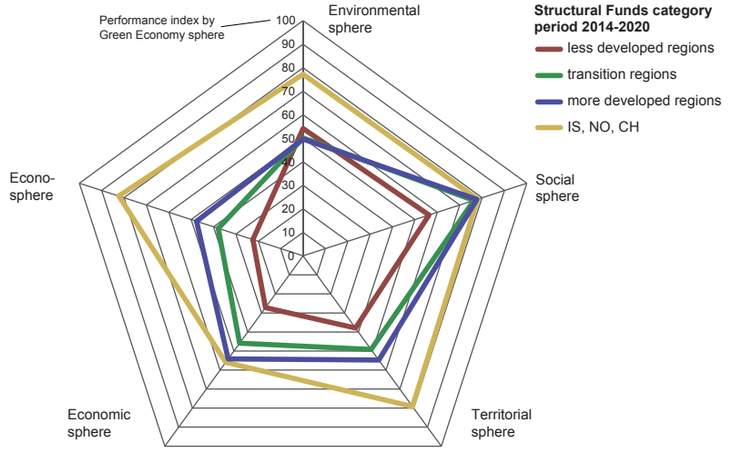
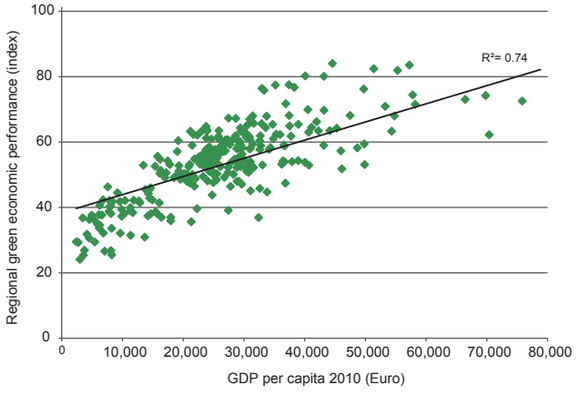
Green economic performance and economic development status



Origin of data: ESPON GREECO, 2014; Eurostat, 2013

Regional green economic performance and regional economic performance



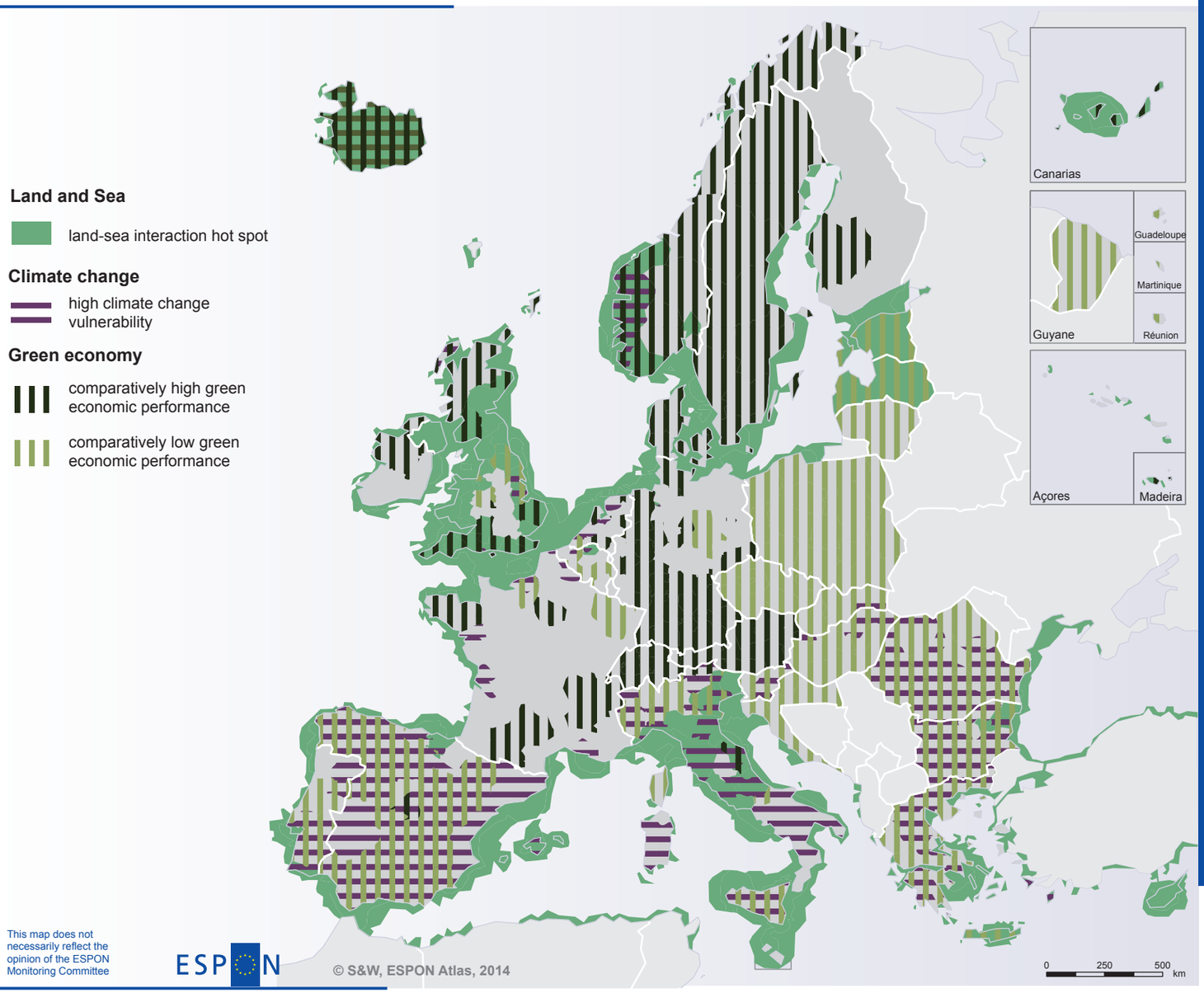
Environment and climate – territorial synopsis

Overall, it is recognised that the seas matter for territorial cohesion. However, increasing opportunities for human use of the sea are set alongside growing realisation of the complexity of land-sea interactions and an awareness of the risks that the new focus on marine areas pose to both ecological and human wellbeing. As a consequence, calls for more integrated forms of planning and governance that have long been a feature of terrestrial planning have begun to emerge for the sea. These perspectives emphasise the importance of good governance arrangements that facilitate integration of sectors and administrative arrangements, both horizontally and vertically, particularly in cross-border and transnational contexts, and cross the land-sea divide.

Europe plays an important role in global climate policy that aims to reach a global deal for emission reductions and encourages the take up of adaptation. However, climate change impacts vary between regions and between countries. Furthermore, climate impacts are different across different types of regions. Thus, not all metropolitan or mountain regions will experience similar climate change impacts across Europe. Moreover, not all regions are currently in a position to react with the same level of appropriate adaptation measures, so that regional vulnerability to climate change varies significantly across Europe. Coordination of adaptation by the EU is considered to be important in order to avoid major gaps in trans-national linkages and to provide common strategic direction to achieve a coherent approach to climate change adaptation within the EU.

Green economy is about enhancing regional competitiveness and territorial cohesion in the long-term, through innovation of the economic base, more sustainable use of natural resources, preservation of environmental capital and fewer environmental risks. Cities and regions hold significant assets that are key building blocks in green economy development. However, not all regions in Europe perform equally as regards green economy. The current green economic performance is highest in the North and West of Europe and lower to the South and East. The process of greening economic sectors requires time, efforts, planning, investments in infrastructure and coherent actions. According to European strategies, steps need to be taken to improve regional green economic performance in Europe and create the ground for growth, jobs, sustainable solutions and economic development in the long run.

Environment and climate – territorial synopsis



This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

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VII. Integrated view to territorial development

Regional policy can be interpreted in several ways. On the one hand, regional policy is development policy, which supports job creation, competitiveness, economic growth, improved quality of life and sustainable development. In turn, these support the implementation of the Europe 2020 strategy. On the other hand, regional policy is the expression of the EU's solidarity with less developed countries and regions, concentrating funds in the areas and sectors where they can make the most difference. Regional policy aims at reducing the significant economic, social and territorial disparities that still exist between Europe's regions.

During the previous decades the EU's policies, actions and funding were concerned with territorial issues. Working on the strenghts of territories, and better connect them are among others in focus of the Commission and the Member States.The encouragement of cooperation between territories is also associated with this. The recent crisis and its asymmetric territorial impacts have increased the importance of the territorial approach.

The concept of territorial cohesion has been highlighted in the European Commission's 'Green Paper on Territorial Cohesion – Turning Territorial Diversity into Strength' (October 2008). This document presented a comprehensive approach and further nurtured the debate around its different interpretations of the concept. Highlighting the rich diversity of European territory, territorial cohesion aims at turning this diversity into an asset for all places. It is thus ensuring a harmonious and balanced territorial development and contributing to a sustainable Europe. Territorial capital and potential are at the centre of these broad objectives, but the scale and the territory considered may change the way to achieve them.

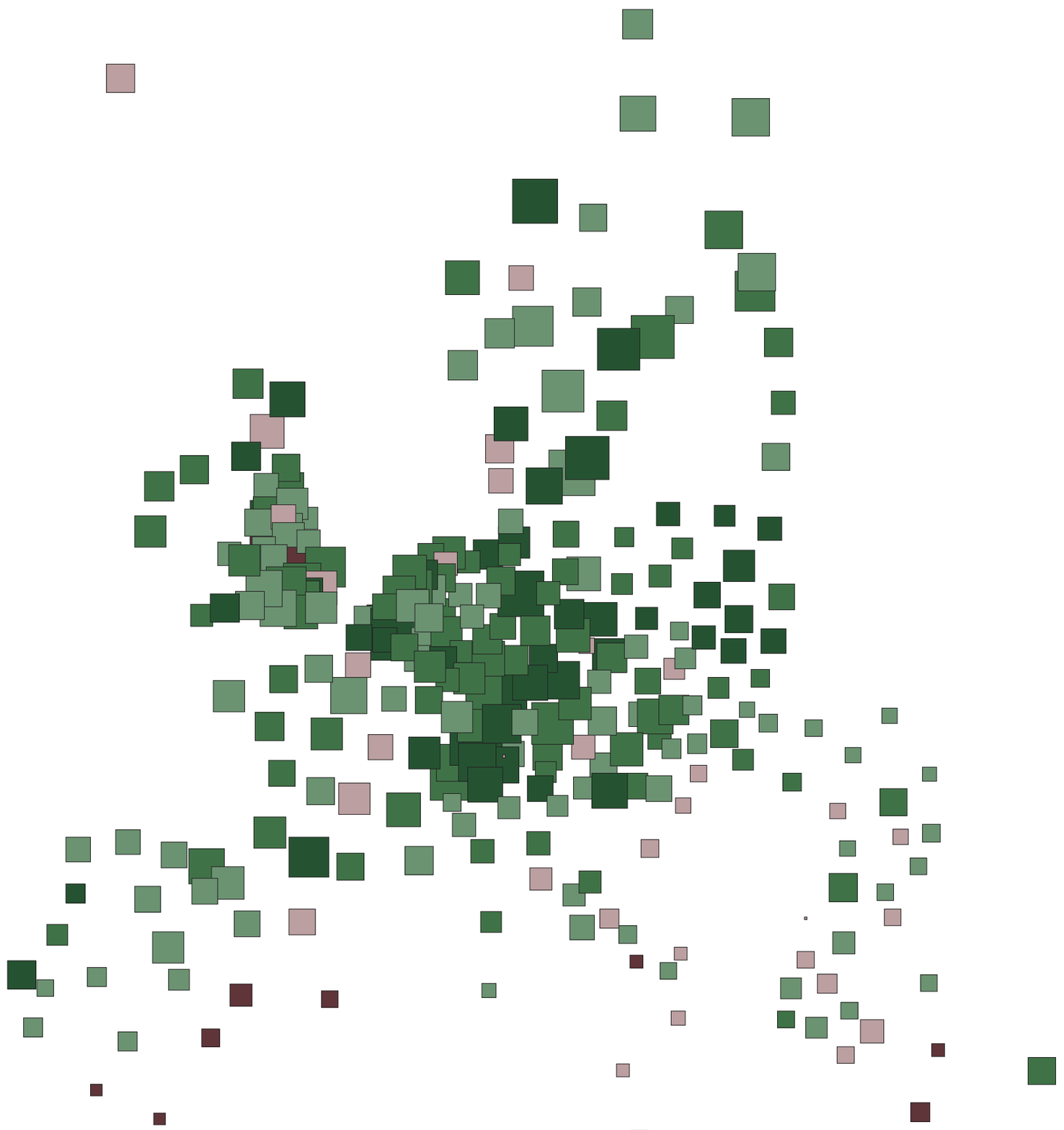
Europe faces a moment of transformation. The crisis has wiped out years of economic and social progress and exposed the structural weaknesses in Europe's economy. In the meantime, the world is moving fast and long-term challenges such as globalisation, pressure on resources and an ageing population intensify. The EU must now take charge of its future.

Europe can succeed if it acts collectively, as a Union. The EU2020 Strategy was set up to help EU regions and cities to overcome the crisis and help turning the EU into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion. Europe 2020 sets out a vision of Europe's economy for the 21st century.

The EU2020 Strategy identifies three key priorities for the EU which are interrelated:

- Smart growth: developing an economy based on knowledge and innovation.
- Sustainable growth: promoting a more resource efficient, greener and more competitive economy.
- Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion.

EU2020 Strategy Index



Regional level: NUTS 2 (2010)
Source: ESPON SIESTA, 2012
Orign of data: Eurostat, 2014

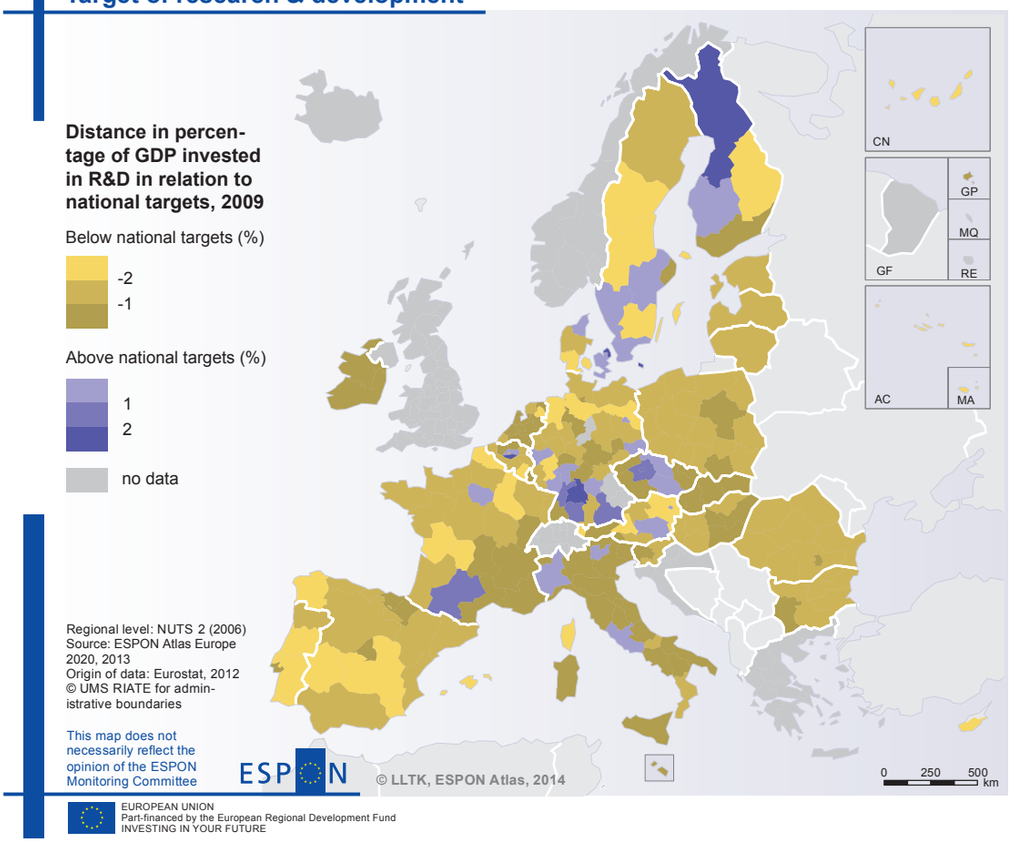
The EU2020 Strategy Index estimates the position of a region in relation to the EU2020 Strategy headline targets by measuring the distance to regions are from achieving these eight targets. A region would score 100 if it had reached all eight headline targets, whereas a region would score 0 if it was positioned the farthest away in all eight headline targets

Smart, sustainable and inclusive growth

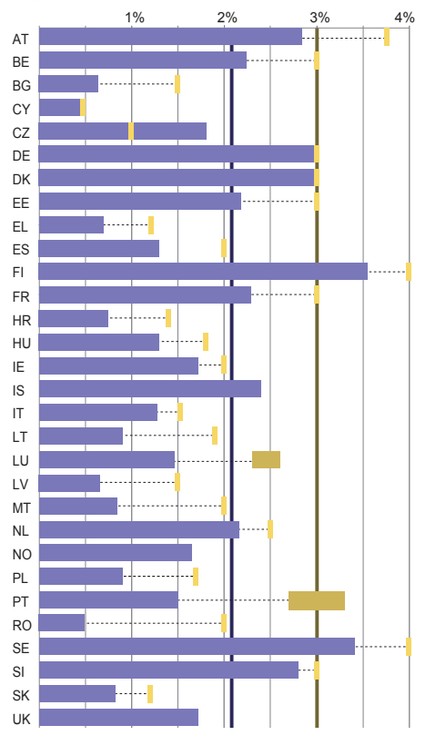
8 **headline targets**

were set up in the EU2020 Strategy, five socio-economic targets and three environmental targets.

Target of research & development



Expenditures for R&D



National targets for R&D expenditures, April 2014

national targets | target ranges (LU, PT) | overall EU target

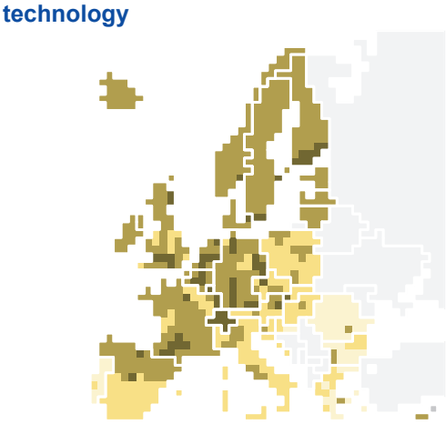
CZ: aim for public sector only; UK: no aim set
IS, NO: no participation in EU2020 Strategy

Expenditures for Research and Development in % of GDP, 2012

national expenditures | EU average

Source: Eurostat, 2014; European Commission, 2014

Human resources in science and technology



Percentage of active population, 2010

25 35 45 | no data

Source: ESPON Atlas Europe 2020, 2013

The EU2020 Strategy has the subtitle “a strategy for smart, sustainable and inclusive growth”. The smart approach is at the heart of the strategy. Smart growth means developing an economy based on knowledge and skills, research and development and innovation (R&D&I), innovative actions and a digital society. The combination of these factors will drive the EU’s future growth and will contribute positively to the EU economy. By promoting higher productivity it will lead to an increase in Europe’s global market share.

The Strategy underlines the essential role of research and development (R&D) in promoting job creation and growth. R&D is the creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this stock to devise new applications. The general indicator which measures the share of GDP spent on R&D is commonly known as GERD (General Expenditure on R&D). This indicator measures primarily the regional resources, both in terms of public and private sector spending, related to R&D.

The private sector resources are more significant as ithey are more conducive to growth, but the public sector resources also play a crucial role, notably by supporting fundamental research. The latter are spatially significant, in particular in those regions that do not have a solid private sector in R&D. The EU2020 Strategy sets the headline target of bringing GERD to 3% of GDP by 2020. In parallel with this, each EU country has defined its own national targets for R&D spending.

Some countries have set their national target similar to the EU’s own target. Other countries were more ambitious by targeting over 3% of R&D investment. However, the majority of the EU countries have set targets below the EU headline figure. Significantly, the official overall estimations of the EC state that, by amalgamating current national targets, EU’s aims will not be achieved. This is of some concern for the EU’s global competitiveness.

The ducational targets of the EU2020 Strategy are related both to smart and inclusive growth. They are aimed at addressing the weaknesses in the education systems in Europe. Because of the obvious connection with the economy, growth, research, innovation and competitiveness, the EU2020 Strategy focuses more on tertiary education. However, the challenges European countries are facing are at all levels of education.

The related headline target is to increase the share of population aged 30-34 with tertiary education to at least 40%. 86 out of 311 regions considered, already reach this target. Most of them are located in Western Europe, but follow a scattered pattern. In general, northern periphery countries and North-West regions score particularly well compared to the EU2020 target. Surprisingly, outperforming economies such as Germany and Austria score very low and their regions are generally quite far from the EU target. This is mainly related to the education systems which focus strongly on apprenticeships. Beyond the national specificities, the general pattern for South-East Europe and Portugal may be the reliance on agricultural production and tourism, which predominantly attract people without tertiary education. Besides

the tertiary education, the compulsory level of education plays an important role. The headline target of the EU2020 strategy for compulsory level of education is to reduce the proportion of early school leavers to less than 10%. It should be noted that drop-out rates vary among European territories. Contrary to most of the maps related to EU2020 targets, the rates of early school leavers in some East European countries are lower than in some regions in Western Europe. Some regions in Western Europe are also doing well (e.g. Austria, Belgium) in terms of having low drop-out rates.

EU2020 targets for inclusive growth deal with job creation, skills and labour market reform, and the reduction of poverty and social exclusion. The profound ambition is to increase the employment rate and the quality of jobs, especially for women, young people, migrants and older workers.

Higher employment rate boosts the European economy, reduces poverty and exclusion, and also contributes to funding the costs of an ageing population (e.g. through the pension system). The commitment to the headline target of an employment rate of 75% for the 20-64 year-old age group by 2020 is ambitious. However, it is critical for the sustainability of Europe's social model, welfare, growth and public finances that this target is being achieved.

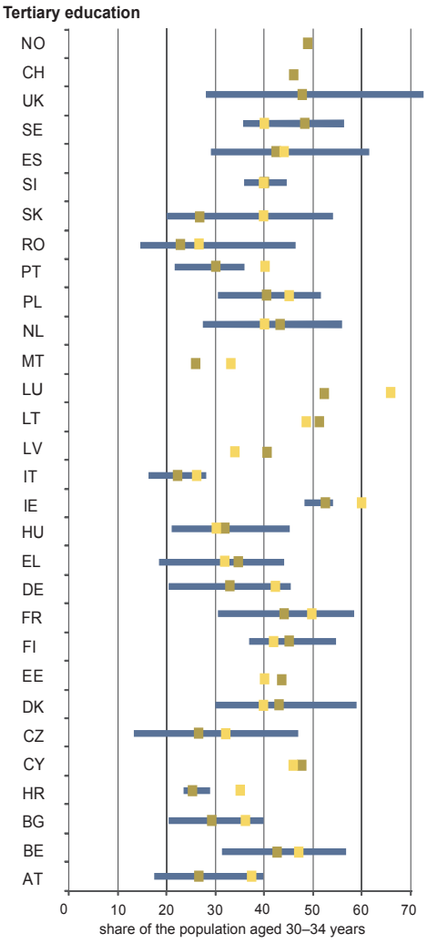
The EU2020 Strategy's main contribution to fighting poverty is the inclusive growth priority. This means that growth has to reach all parts of society and that excluding people in this process is not acceptable. EU2020 set up a target to reduce the number of people at risk of poverty or social exclusion by at least 20 million by 2020. This is the only headline target expressed not as percentage, but as a absolute number. In 2010 there were more than 115 million people officially considered poor, corresponding to 23.5% of the total population, and the reduction of at least 20 million means moving below 19.5%.

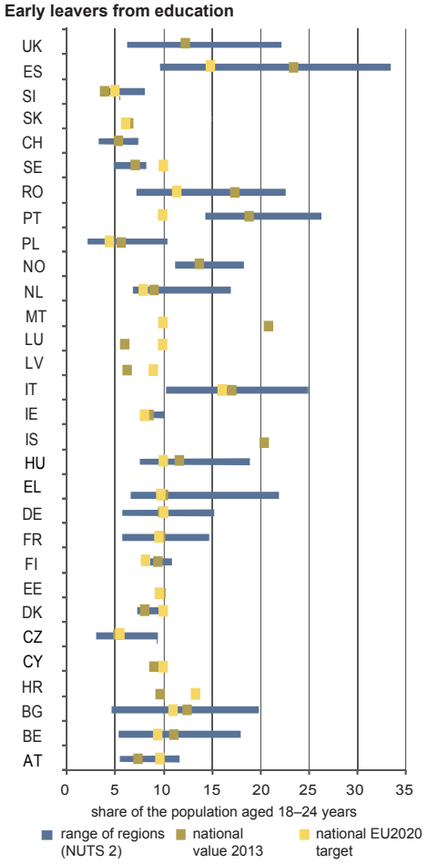
Poverty has a very clear spatial dimension that cannot be overlooked. Also, it has clear links with the EU's long-term cohesion policy.

The third pillar of the EU2020 Strategy is sustainable growth, which attempts to develop a greener economy. Taking into account that a greener economy must be necessarily resource efficient, it has to be focused on green technologies that allow for combating climate change and for achieving better energy efficiency. In addition, it is evident that resource efficiency is paramount to reducing costs associated with the consumption of raw materials and energy. It has also obvious security and geopolitical implications that are repeatedly quoted therein (i.e. the need to reduce dependency on non-EU countries) and it has the potential to create jobs in this sector. For all these reasons resource efficiency and economic competitiveness are well-connected. Resource efficiency is significant for the environment, as it carries current and future economic value.

The three environmentally related targets of the EU2020 Strategy focus on energy efficiency and

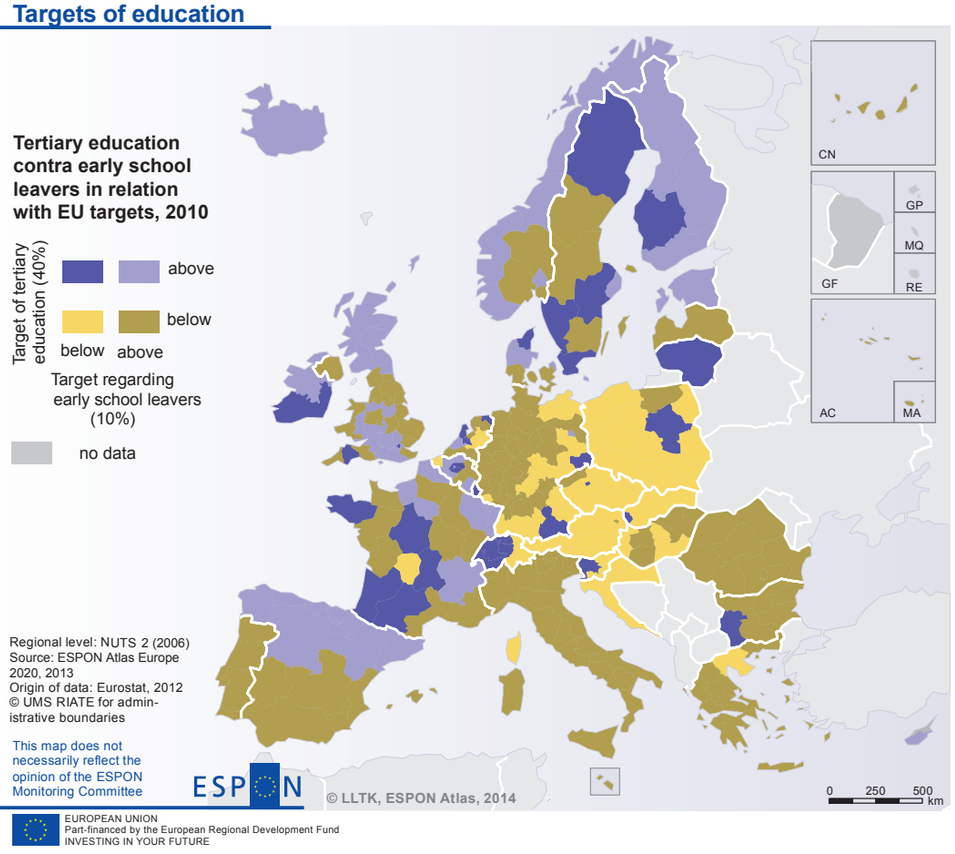
EU2020 targets on education





Origin of data: Eurostat, 2014

Targets of education



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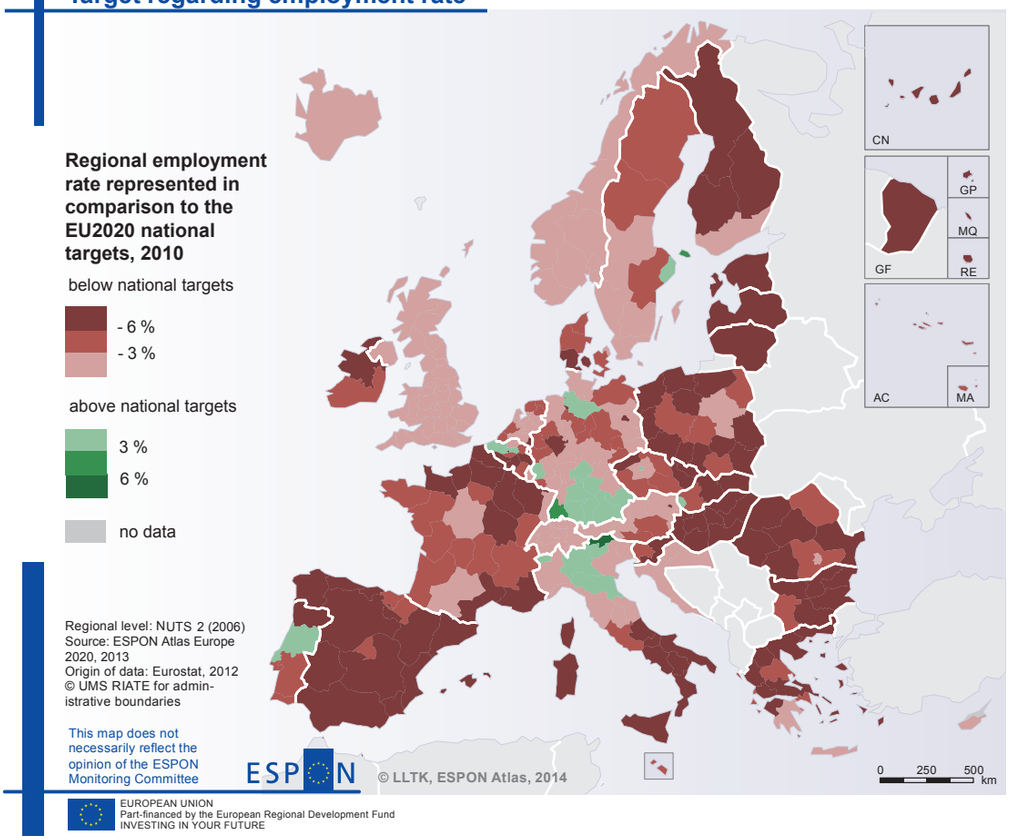
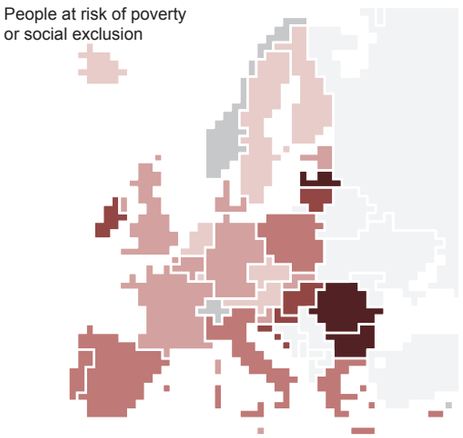
Target regarding employment rate



Risk of poverty

People at risk of poverty or social exclusion

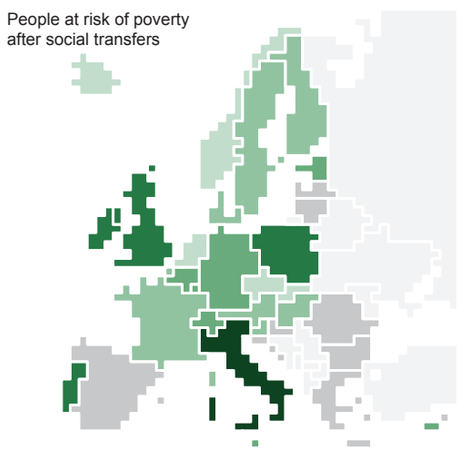


Represented as distance to the EU2020 target (%), 2010

3 4 5 6 no data

Source: Eurostat, 2010

People at risk of poverty after social transfers

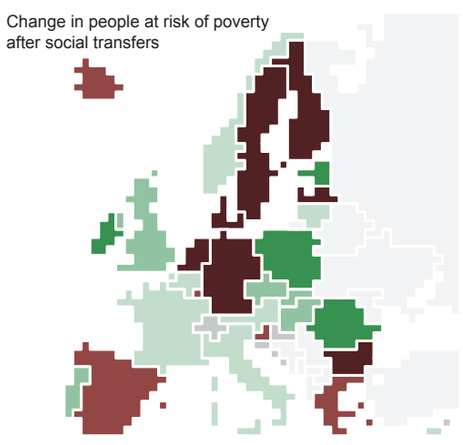


At risk poverty rate (%), 2010

12 14 16 18 no data

Source: Eurostat, 2010

Change in people at risk of poverty after social transfers



Percentage points difference (%), 2005–2010

-2 -1 0 1 no data

Source: Eurostat, 2010

greenhouse gas (GHG) emissions.

One of the basic strategies to meet the energy dependency challenge, reduce the greenhouse gas emissions, promote technology and research development or promote job niche growth is to develop renewable sources.

The greenhouse gas (GHG) emissions should be reduced in 2020 by 20% compared to 1990, including a possible reduction of up to 30% if the conditions are right.

To meet these challenges, the EU has set the headline target for renewable sources, in particular in the share of renewable energy in gross final energy consumption, to 20% by 2020.

Scandinavian and Baltic countries (with the exception of Denmark and Lithuania) are the most sustainable in terms of use of renewable energy sources. Austria, Portugal and Romania also exceed the EU targets. The remaining countries are under the EU2020 Strategy's headline target, with extreme situations in island-states and in small countries, including the UK. The pattern of renewable energy sources is geographically heterogeneous but much depends on the ambitions of each country's respective policies. Countries which are in a worse situation are not necessarily those which have committed themselves to higher targets. In contrast, the countries which have committed to less are typically those which are already having a higher share of renewable energy and are conveniently above the 20% target.

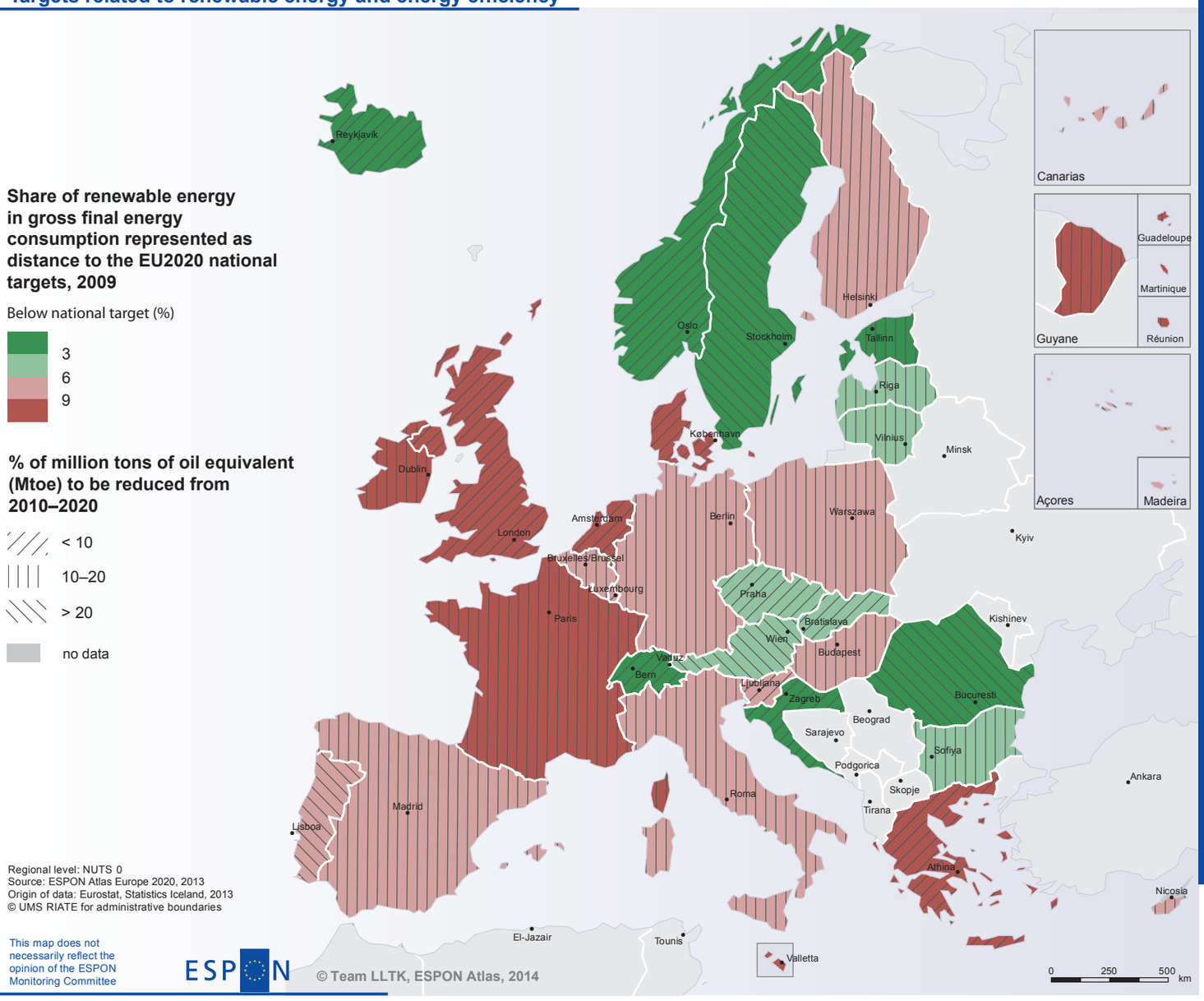
The EU2020 strategy proposes another specific headline target on energy which relates to the energy intensity of the economy.

Regarding energy efficiency there is a great divide between the East European countries and tWestern Europe.

Concerning the national targets on energy efficiency, the pattern is politically sensitive in the sense that it depends on governmental decisions. Importantly, the European Commission has stated in the reports on the EU2020 strategy progress that Member States have taken limited ownership of this target (indeed, some Member States do not provide their national targets) and that targets set by countries are 'worrying' as they are completely below expectations (i.e. some countries set targets under 10% while the EU target is to reduce by 20%).

The EU2020 Strategy makes clear that GHG reduction is not only an aim with an environmental rationale, but also it has a clear socio-economic dimension in the sense that there are increasing possibilities for new technologies to be developed. Moreover, it also gives a boost for the creation of new jobs in the sectors involved. Reduction of GHG emissions is a critical issue reacting against the fact that climate change is becoming stronger due to human impact and that GHG are artificially generated.

Targets related to renewable energy and energy efficiency



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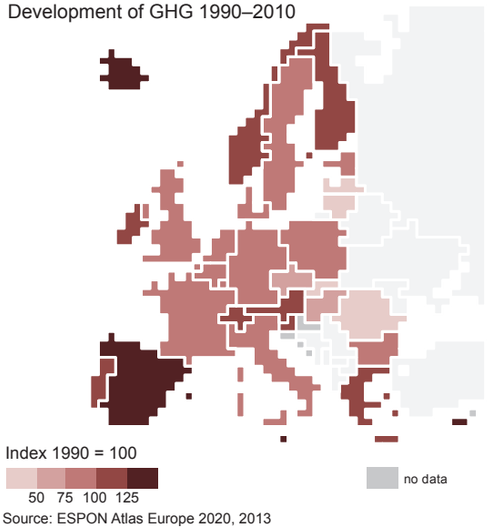
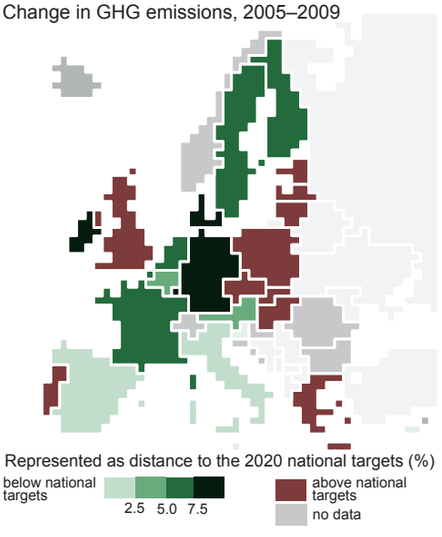
Greenhouse Gases (GHG) emissions

Development of GHG 1990–2010

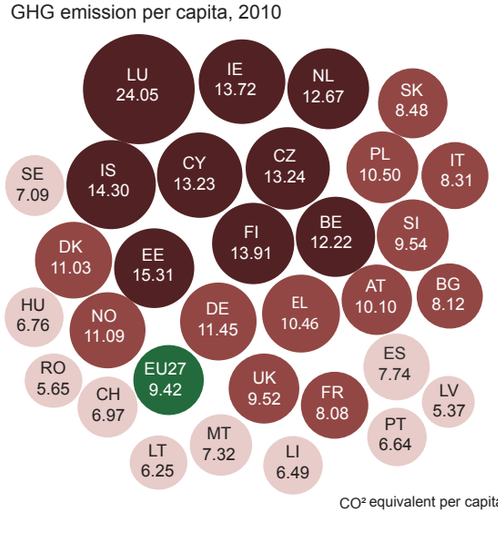


Source: ESPON Atlas Europe 2020, 2013

Change in GHG emissions, 2005–2009



GHG emission per capita, 2010

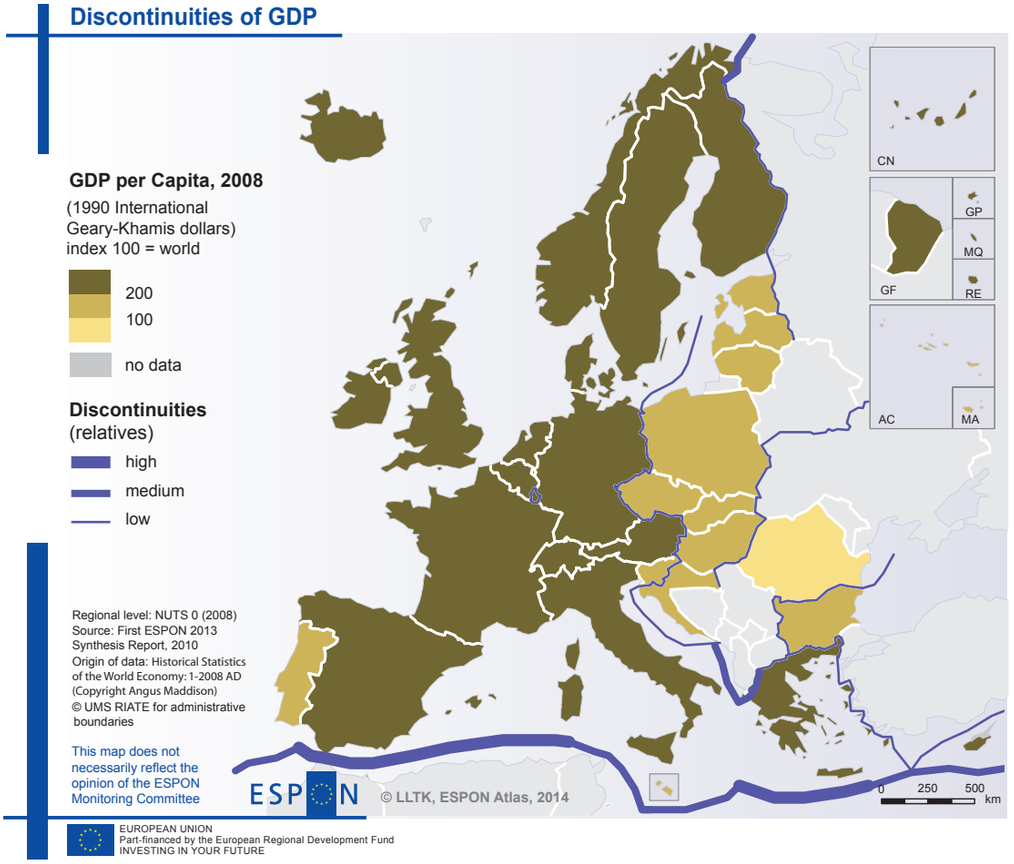


Territorial cohesion

5.6

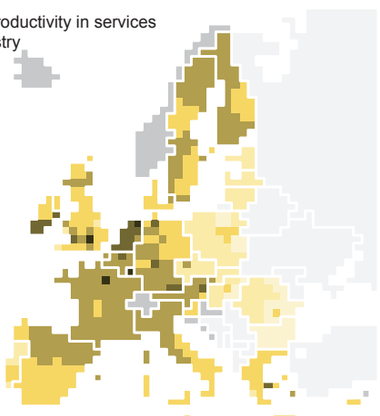
times higher is the GDP/per capita of the hightest country value compared to the lowest value.

Discontinuities of GDP



Territorial diversities

Labour productivity in services and industry

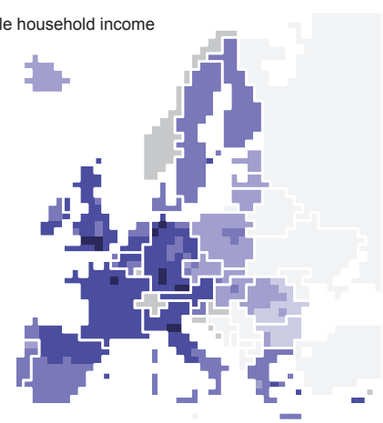


In % of EU average, 2007

50 75 100 125 150 no data

Source: ESPON INTERCO, 2012

Disposable household income

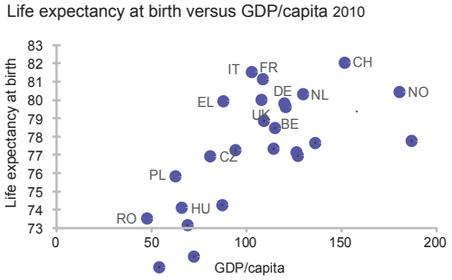


In 1000 Euro, 2007

0 5 10 15 20 25 no data

Source: ESPON INTERCO, 2012

Life expectancy at birth versus GDP/capita 2010



Source: Eurostat, 2010

Cohesion policy focuses on the potential of inter-connected economic centres. These are seen as urban drivers supporting smart growth and leading to more balanced territorial development through positive diffusion effects. A more inclusive understanding of territorial cohesion points at fair access to services and knowledge through appropriate infrastructures, stating that everyone should have the same development opportunities no matter where they live. Thus, territorial cohesion can be considered as the territorial dimension of the European social model, taking into account the socio-economic disparities at all levels and strengthening both solidarity and competitiveness. In the Treaty on the Functioning of the European Union (TFEU), territorial cohesion has the role of enabling every territory to find its own path of development, according to its comparative advantages.

A significant characteristic of territorial cohesion as a policy objective is harmonisation of different development paradigms, such as regional competitiveness, convergence and sustainability.

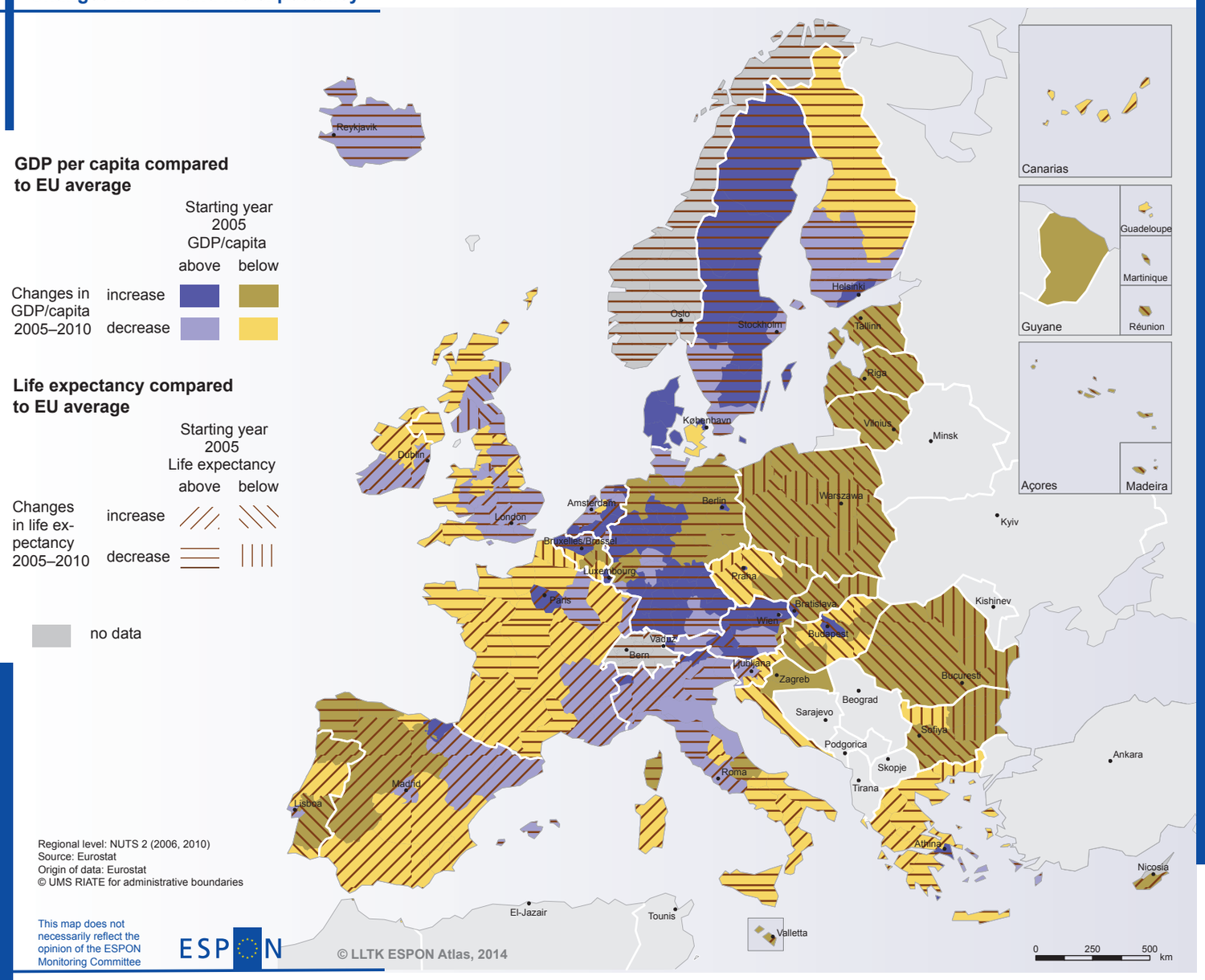
There is no general trend towards convergence in all territories. Convergence trends over the past decade - including the period of crisis - were strongest for the indicators measuring "the performance of local economies and their competitiveness"; however, there are disparities which are classified as medium or high. For GDP per capita, there is a slight trend towards convergence for remote areas, but starting from very strong disparities; however, the disparities between urban regions or regions close to cities remain stable. Labour productivity is the only indicator that shows a remarkable trend towards more convergence, but the data covers only national levels.

Indicators for measuring "innovative territories" show heterogeneous results, with tertiary education showing a trend towards convergence, while for employment disparities increased evenly.

Indicators under the objective "fair access to services, markets and jobs" still show the highest existing disparities over all indicators. Only accessibility potentials by road and air indicate a moderate approach towards cohesion, while for the accessibility potential by rail the existing gaps seem to have consolidated.

The indicators for "inclusion and quality of life" reveal the smallest existing disparities for demographic aspects, but these small differences are stable over time. "Life expectancy at birth" remained almost stable and the general range of values is rather small; however, there are variations amongst countries. For the other socio-economic indicators, disparities are medium to very high, with generally clear trends towards cohesion. There is a clear divide between Wetsern and Eastern EU Member States for the indicator "Disposable household income"; however, countries with the highest disposable income have also the highest disparities among their regions.

Changes in GDP and life expectancy



Territorial cohesion analysis

Indicator	Years available	Disparities	Trend
Strong local economies ensuring global competitiveness			
GDP per capita in PPS	1997–2008	△	↑
Unemployment rate	1999–2009	△	↑
Old age dependency ratio	2000–2010	△	↓
Labour productivity per person employed	1995–2010	△	⇑
Innovative territories			
Population aged 25-64 with tertiary education	2008–2010	△	↑
Employment rate 20-64	1999–2009	△	↓
Fair access to services, markets and jobs			
Accessibility potential by road	2001, 2006	▲	↑
Accessibility potential by rail	2001, 2006	▲	↓
Accessibility potential by air	2001, 2006	△	↑

Indicator	Years available	Disparities	Trend
Inclusion and quality of life			
Disposable household income	1996–2007	△	⇑
Life expectancy at birth	2000–2008	△	●
Proportion of early school leavers	2000–2010	△	⇑
Gender imbalances	2000–2009	△	●
Difference in female-male unemployment rates	1999–2010	▲	↑
Ageing index	2000–2010	△	↑

Disparities (StDev/Avg)

- 0–0,2 small △
- 0.2–0.4 medium △
- 0.4–0.6 high △
- > 0.6 very high ▲

Trend towards cohesion

- strong cohesion trend ⇑
- trend towards cohesion ↑
- disparities remained stable ●
- widening gaps ↓

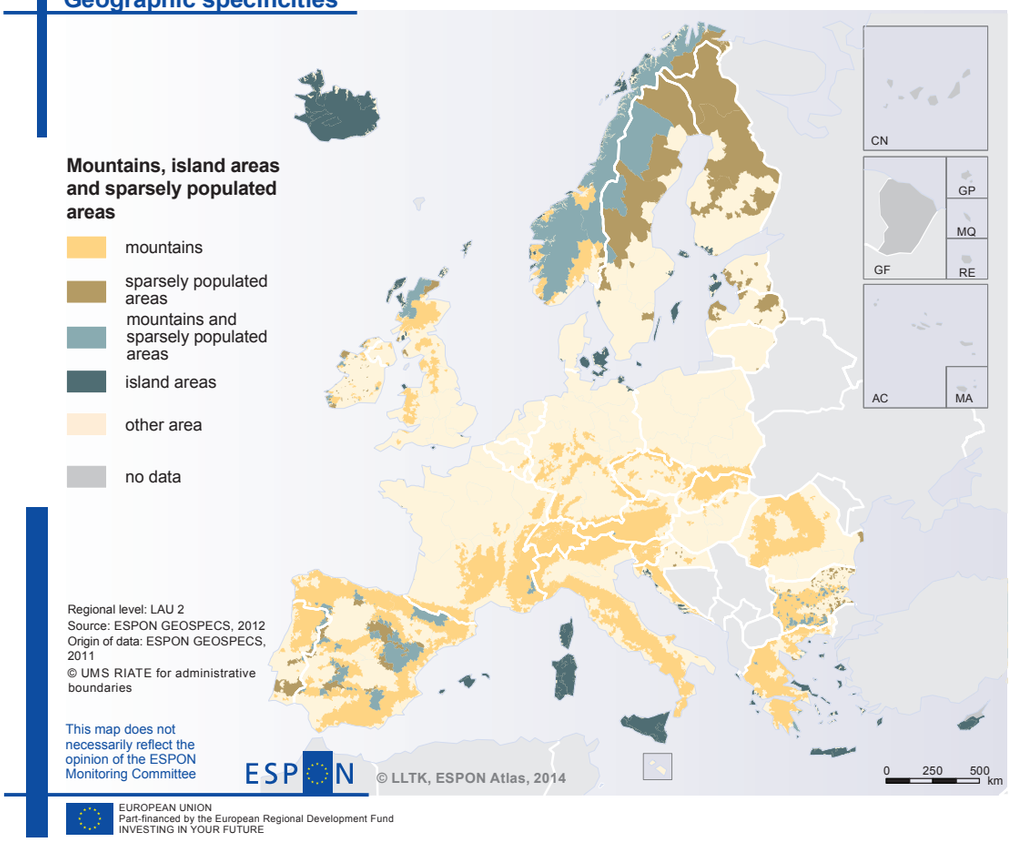
Source: ESPON INTERCO, 2012

Territorial diversity

47 %

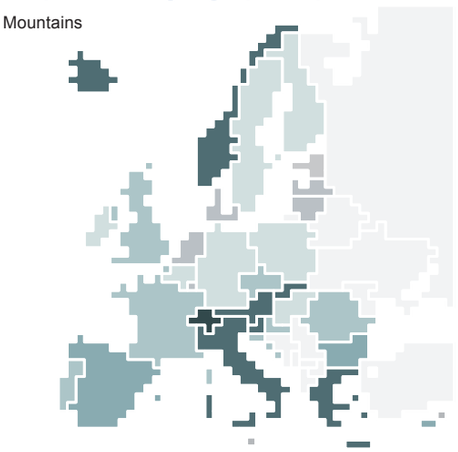
of the ESPON territory is covered by areas with geographic specificities.

Geographic specificities

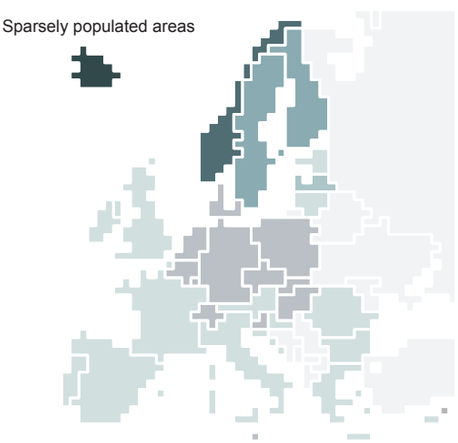


Proportion of geographic specificities

Mountains

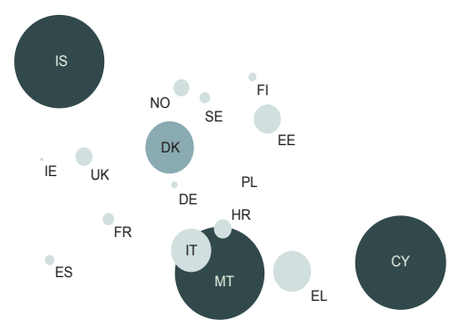


Sparsely populated areas



Island areas

Defined as territories disjoint from the European mainland and the British Isles (Ireland, UK)



In percentage of national area

20 40 60 80 no data

Source: based on ESPON GEOSPECS, 2012

Regions with specific territorial features, such as islands, mountains and sparsely populated regions, have received increasing attention in recent years, most notably in article 174 of the Treaty on the Functioning of the European Union (TFEU) and the European Commission's Green Paper on Territorial Cohesion (October 2008).

These categories of spaces are approached in two ways: as having particular challenges, and as having particular assets, many to the benefit of Europe as a whole.

Physical characteristics are therefore seen as a source of development potentials and possibilities, rather than simply as a constraint.

Taking advantage of the specific attributes of specific areas requires permanent compensatory measures that address structural and permanent imbalances and focuses „one-off interventions" on specific situations.

Different regional specfities need different development strategies. Furthermore, such strategies should not be designed at the level of NUTS 2 or NUTS 3 regions, but for individual islands or valleys, and functional regions. In this respect, territorial cooperation is fundamental for specific areas. Geographic specificities do not stop at borders. When considering the integration of these territories, it is necessary to take into account cross-border and transnational interactions and interdependencies.

The natural capital of these specific areas is one of their main assets which can be an opportunity in economic terms, as it either attracts residents (and visitors), or provides opportunities for the exploitation of resources, thus contributing to generating income for the area. Furthermore, these areas provide vital ecosystem services to the European continent as a whole.

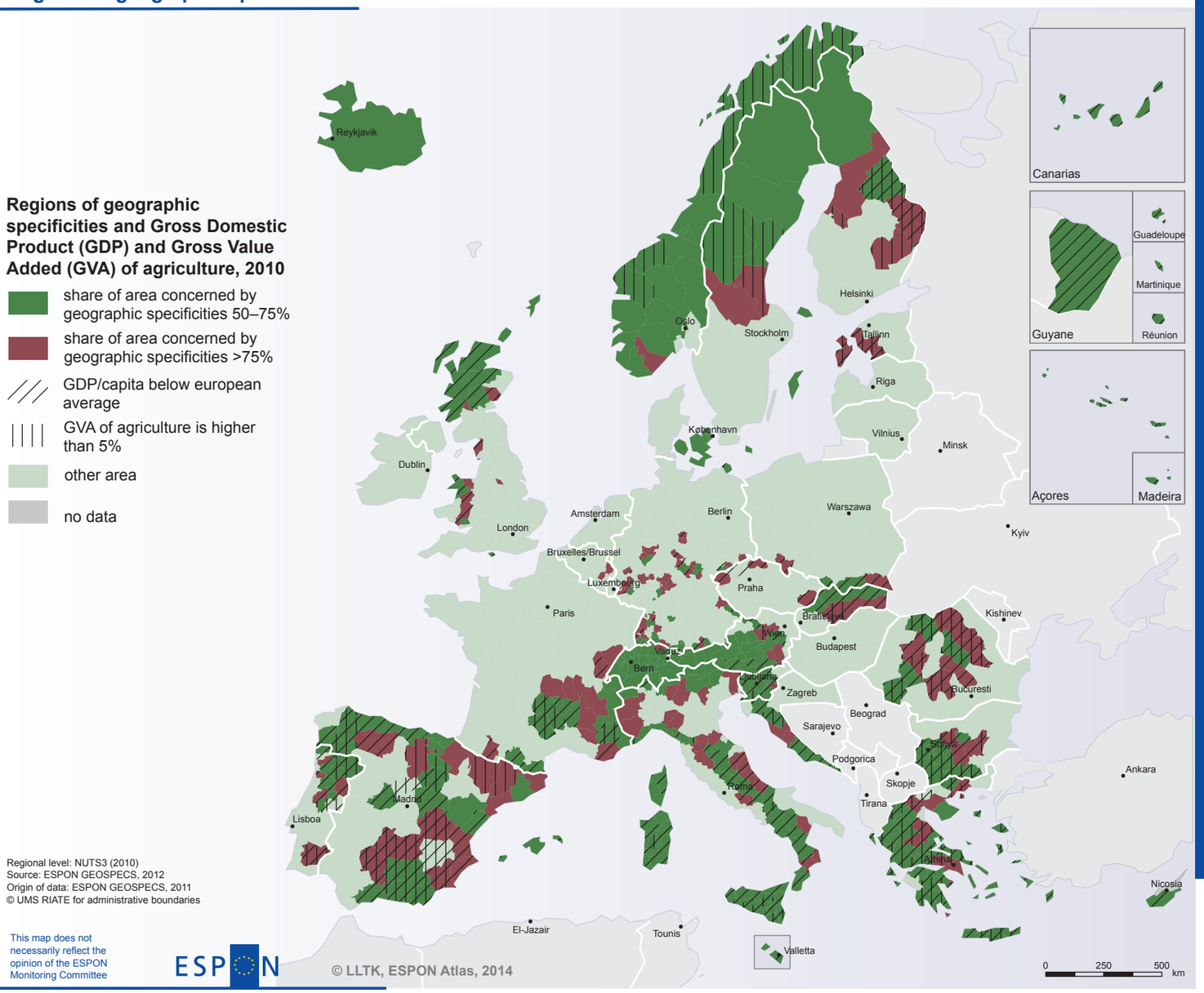
With the exception of Sparsely Populated Areas (SPA), these specific areas tend to be characterised by higher levels of biodiversity and higher proportions of protected areas compared to the European average – in particular mountains and islands.

Finally, one general characteristic of the specific areas is that they are associated with high levels of renewable energy resources. Hydropower is an important source of energy in mountain areas; offshore wind, wave and tidal energies can be exploited from islands; SPAs often offer resources for biomass energy generation.

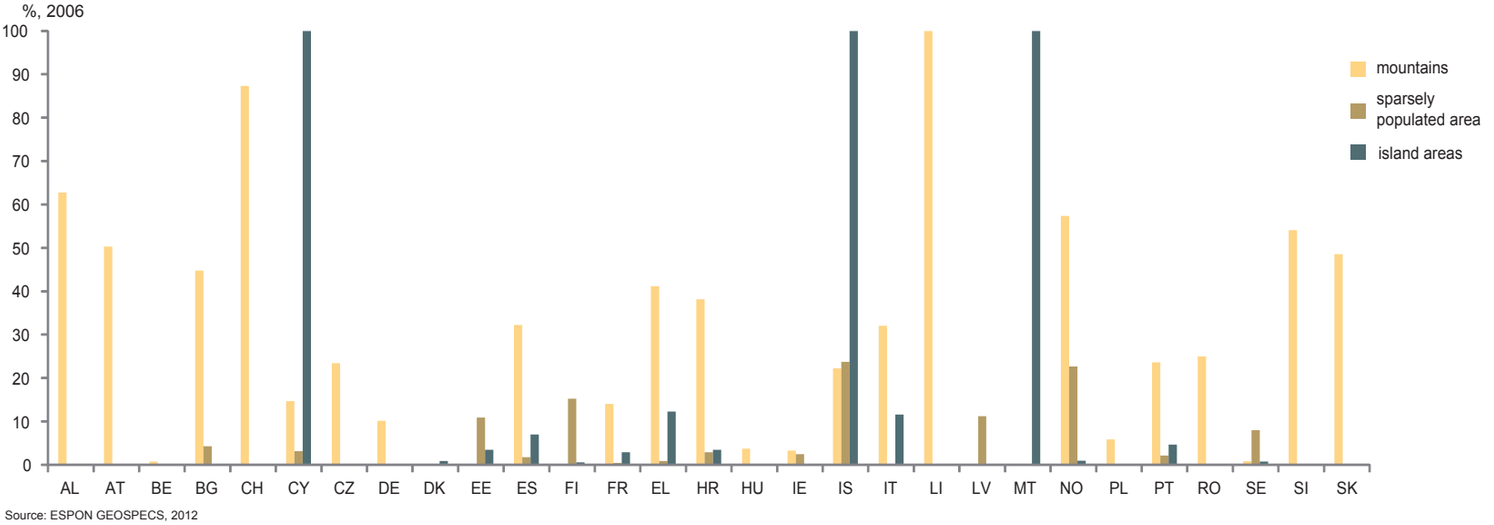
The debate and studies on the areas with geographic specificities is often limited to the identification of structural constraints and barriers to development. Although the tangible natural assets of a region are often well known to the researchers and stakeholder communities, the strategies that would make it possible to fully exploit these territorial potentials often remain to be defined.

Further progress should be made in moving away from viewing geographic specificities as "handicaps" and recognising their values.

Regions of geographic specificities



Share of inhabitants in geographicly specific areas



Source: ESPON GEOSPECS, 2012

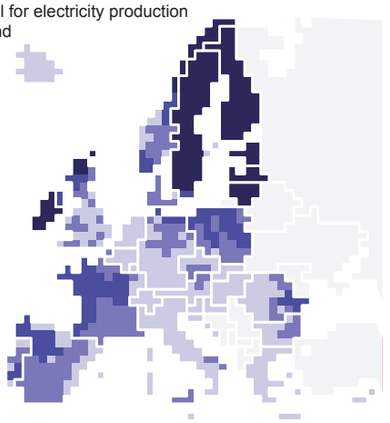
Sustainable environmental development

1538 **million tons of oil equivalent (Mtoe)**

was the primary energy consumption of the EU in 2011, while EU2020 energy targets aim to reduce it to 1474 Mtoe.

Renewable energy potential

Potential for electricity production from wind

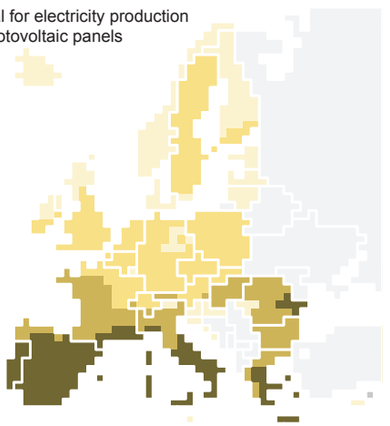


Potential for electricity production from wind power station represented in meters/second (m/s), 2005

100 250 500 no data

Source: ESPON SIESTA, 2012

Potential for electricity production from photovoltaic panels

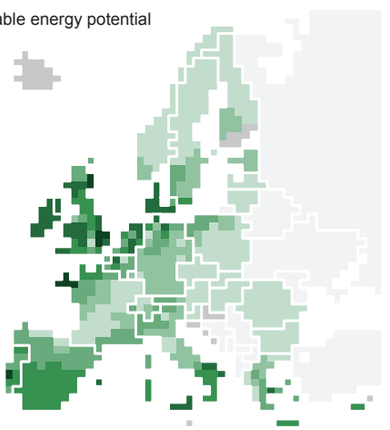


Potential for eletricity production from photovoltaic panels in kWh/km², 2005

800 1000 1200 no data

Source: ESPON SIESTA, 2012

Renewable energy potential

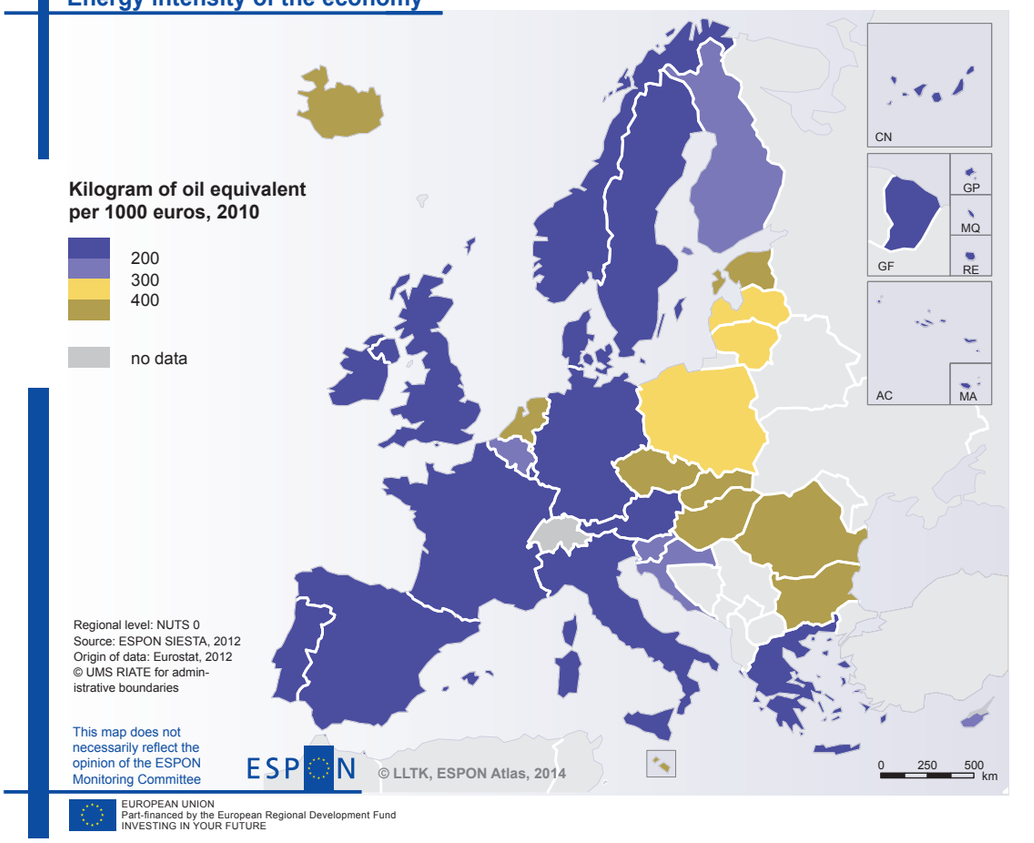


Renewable energy potential (tons of oil equivalent/km²), 2010

25 50 100 150 200 no data

Source: based on ESPON GREECO, 2013

Energy intensity of the economy



Sustainable growth in the context of the EU2020 Strategy envisages the European economy to maintain its leadership in the world and its competitiveness, especially through the delivery of new processes and technologies. In the Strategy it is laid down that the EU economy should be focussing on green technologies that allow for combating climate change and help achieving energy efficiency. The Strategy also emphasises that such an approach will prevent environmental degradation, biodiversity loss and unsustainable use of resources.

With regard to energy, one of the main objectives for EU countries is to develop renewable sources. The head target of the EU2020 Strategy is to achieve 20% of the share of renewable energy in gross final energy consumption by 2020.

The main sources for renewable energy are wind, solar and biomass. With regard to wind power potential, ESPON research identifies those regions in Europe which have the highest potential for producing electricity from on-shore wind power. Not surprisingly, the regions exposed to the prevailing Westerly winds along the Atlantic coast of Europe, and including the Baltic Sea Region, are those showing the greatest potential.

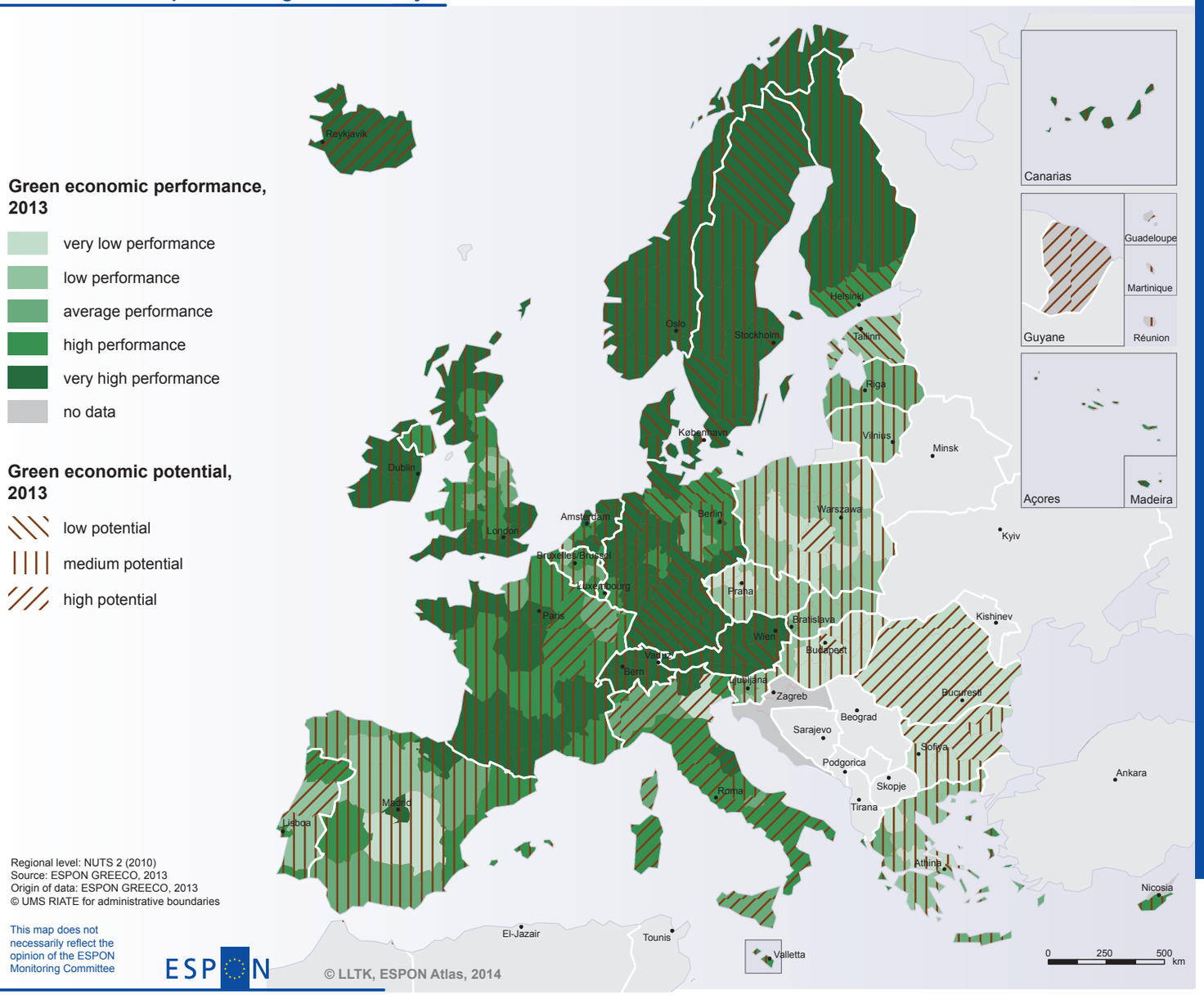
The pattern of solar power potential for electricity production from photovoltaic panels is quite predictable, with the Southern regions of Europe being those with the highest potentials, including not only the Mediterranean Basin but also Atlantic regions in Portugal and some of the Balkan and EU Black Sea regions.

The so called “green economy” is a political rather than a scientific concept. It is defined by the Rio+20 conference 2012 in its final United Nations document entitled “The future we want”: The green economy – “in the context of poverty eradication and sustainable development” – “should contribute to eradicating poverty as well as sustained economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth’s ecosystems”.

When measuring regional green economic performance one has to be mindful of the core features of the green economy, the environmental sphere, the social sphere, the territorial sphere, the economic sphere and the econosphere (N.B. the econosphere links the environment with the economy and is usually measured by environmental and resource productivity indicators). The green economy is also determined by the characteristics of the economic sectors. The green economy potential depends on the so called ‘green economy factors’ such as access to technologies and environmental awareness.

The results of the combined assessment of the green economy performance and the green economy potential show that both the performance and the potential seem to be higher in the North-West of Europe, in some regions of the British Isles, and in some specific NUTS 2 regions located in Mediterranean countries. In contrast, the performance and potential of the green economy are low in Eastern Europe, in the Balkans and in most regions of the Iberian Peninsula.

Performance and potential of green economy



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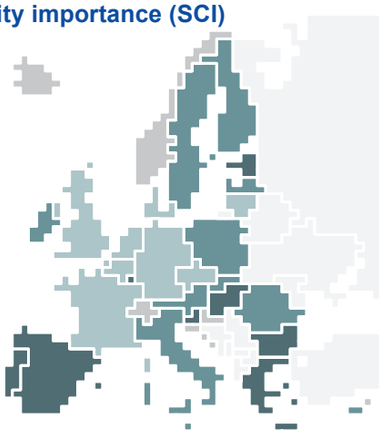
Percentage of Natura 2000 sites of community importance (SCI)

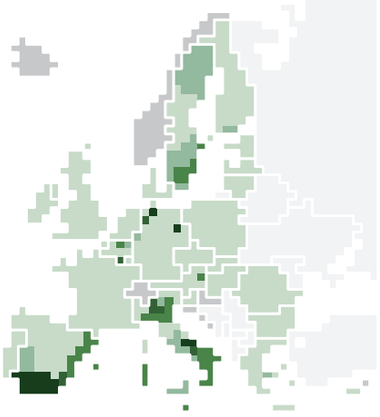


Percentage of Natura 2000 SCIs of each country, 2011

10 20 no data

Source: ESPON GREECO, 2013

Weighted share of municipalities



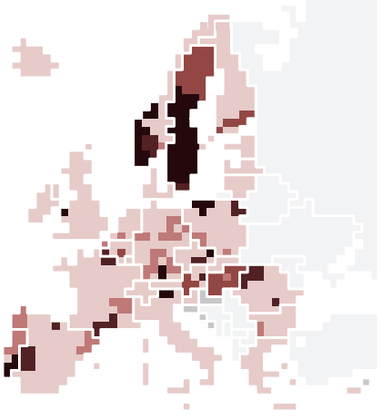
Weighted share of municipalities (%), 2013

5 10 25 50 no data

Municipalities that have signed the Covenant of Majors and have also submitted an Action Plan.

Source: ESPON GREECO, 2013

Number of greentech clusters



Number of greentech cluster, 2013

0.25 0.5 1 1.5 no data

Source: ESPON GREECO, 2013

Integrated territorial development – territorial synopsis

The Europe 2020 Strategy launched by the European Commission in 2010 constitutes a growth strategy for the decade 2010-2020. Its aim is to boost Europe‘s global competitiveness and help the EU countries recover from the recent crisis through the smart, sustainable and inclusive dimensions of growth.

Smart, sustainable and inclusive growth has both a time and a territorial dimension to the economic recovery. In relation to the time dimension, some of the headline targets are unlikely to be achieved in a notable number of regions or Member States. Furthermore, the national targets are generally too lenient in the sense that they do not guarantee that the overall aims of the EU2020 Strategy will be attained. The EC has announced in late 2011 that not all the regions could or would reach the EU2020 Strategy targets that have been set. In practice, the current gap in a large number of regions means that the implementation of the Strategy must be further considered and facilitated by the EC.

At the moment, smart, sustainable and inclusive dimensions of growth are territorially uneven and the general trend towards convergence in the ESPON territory is on hold due to the crisis.

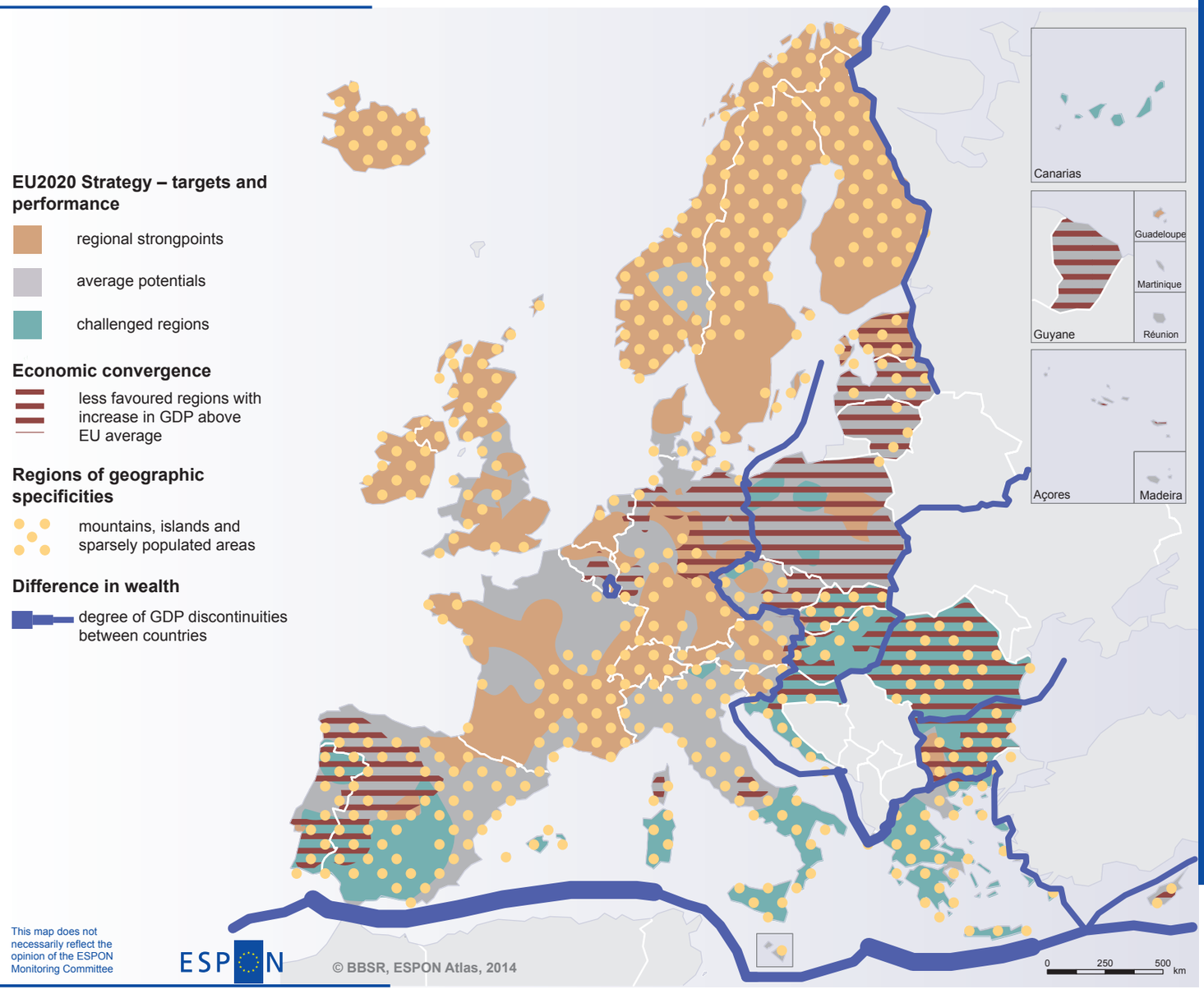
Concerning indicators measuring “the performance of local economies and their competitiveness” convergence was strong, however, disparities still prevail and these have to be addressed. Regarding the objective “inclusion and quality of life” disparities were small but existing differences are stable over time.

Regional development policies in general have to foster investments in regions and cities that contribute to growth and job creation and to the competitiveness of the European economy. In doing so, policies have to adapt to global challenges, such as the emergence of new markets, depletion of resources and climate change, by choosing a development direction that is less resource-intensive and thus more sustainable.

As the analysis of sectors shows, renewable energy, tourism and transport are likely to remain the backbone of the EU economies, a ‘greening process’ seems largely inevitable. At the same time, it is difficult to estimate whether greening is occurring fast enough to be able to effectively address the current and future challenges.

Current greening of economic performance, however, differs significantly across the EU Member States. Besides geographical preconditions, differences in prosperity levels amongst the countries and regions have a strong impact on the effectiveness of the green solutions. Environmental, economic, cultural and other factors have also a big influence. Less developed ESPON countries are often struggling with fundamental shortages and tend to focus on more urgent development challenges. In general, the Western Member States tend to perform better in the green economy sectors than the Eastern Member States.

Integrated view – territorial synopsis



This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

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VIII. Governance, territorial cooperation and EU policies

The EU has always fostered cooperation among Member States but also between Member States and Non-EU Member Countries.

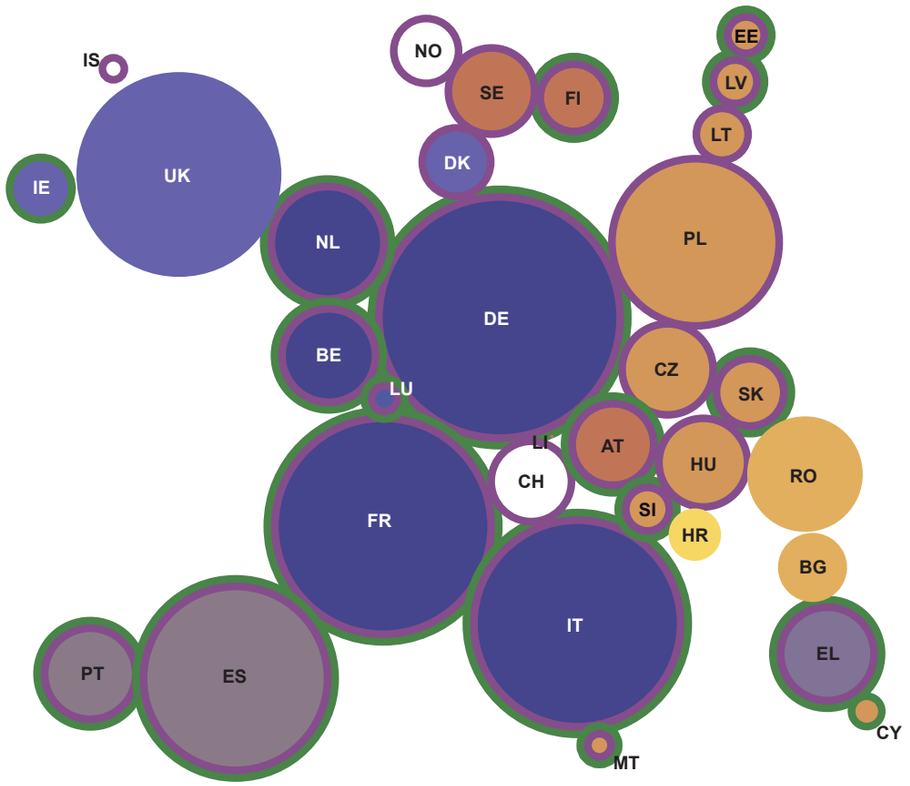
The progress towards EU integration has been playing a crucial role in protecting and ensuring the stability of democracy on the European continent. Despite the economic crisis the EU has insisted on strengthening closer integration. Over the 2007-2013 period, the EU has grown to include now 28 Member States.

Moreover, 18 countries coordinate their national economic policies by adopting the euro as their currency. Most of the Member States, which joined before 2004, are part of the Schengen zone and are also members of the Euro area. Consequently, they have already reached a more advanced level of social and economic cohesion. Over the past decade, new members also joined the Euro area. Currently, more than 333 million EU citizens use the euro as their currency and enjoy its benefits.

Economic growth and job creation are strategic priorities for the European Union and the Member States (Lisbon Strategy, 2000). The common EU policies cover all sectors of the economy including the long established Common Agricultural Policy, the Competition Policy, and the more recent policies such as Environmental and Cohesion Policy, or the Internal Market policies.

The EU may be one of the wealthiest regions of the world, but there are large territorial disparities between different Member States and within individual Member States. The wealthiest country, Luxembourg, is more than seven times richer than Romania and Bulgaria, the least affluent EU members. The regional policy of the EU expresses directly the solidarity with the less developed countries and regions. The aim is to reduce the significant economic, social and territorial disparities that still exist between regions in Europe. It should be noted that other policies also have an impact on the development of certain regions which are aimed at improving competitiveness, the evolution of production in all its forms, or the labour market. All these measures may have a different impact on different regions, depending on their economic and social status.

Strong regional integration of the continent is achieved through different types of territorial cooperation; for example, twin cities, cross-border, transnational and interregional cooperation. It is evident that European territorial cooperation plays a crucial role in developing a functionally integrated European continent, and also serves as a cornerstone of integration. From a decision maker, stakeholder and expert perspective, democratic governance in European territorial cooperation brings a real European added value. Commitments to promote democratic principles, the rule of law and human rights are key principles of the EU. Moreover, EU policies demonstrate that beyond the common or sometimes antagonistic economic interests of its members, the EU is the clear expression of democratic values.



ESPON countries by date of EU membership in 2014

1 7 10 19 28 33 41 57 non EU

Schengen area Euro area

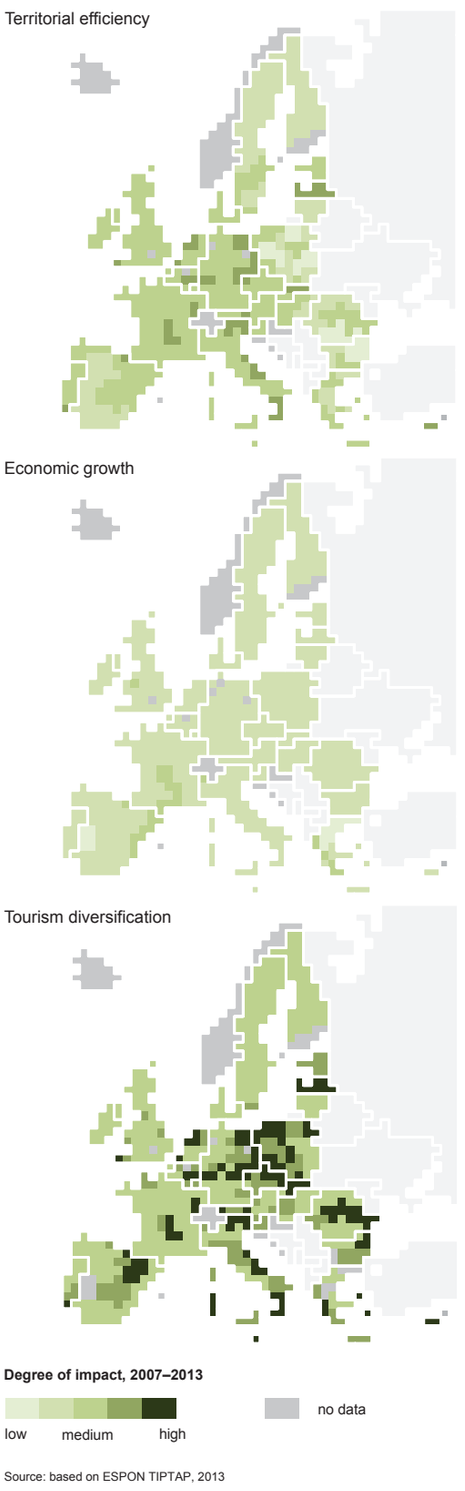
Size of circles proportional to population of the countries

Territorial dimensions of different policies

37.1 %

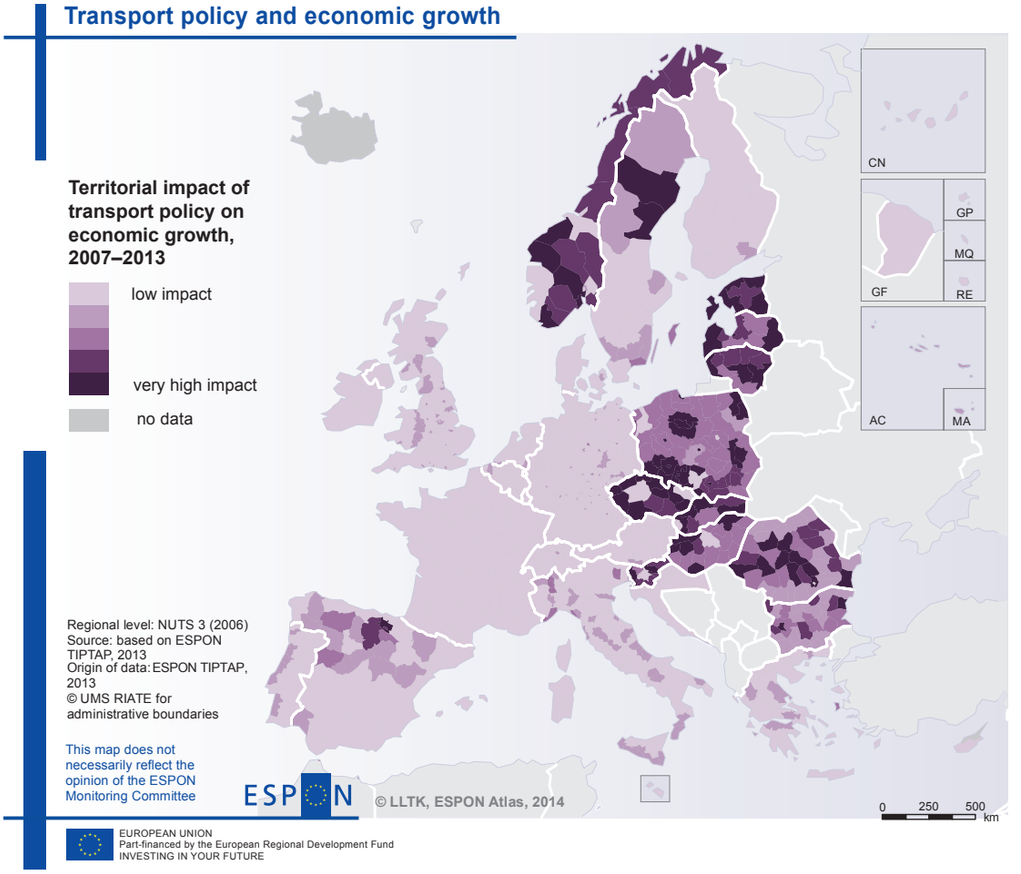
of EU regions and 39.1 % of their inhabitants are affected by the directive on critical infra-structure.

Territorial impact of Common Agri-cultural Policy (CAP)



Source: based on ESPON TIPTAP, 2013

Transport policy and economic growth



It has long been recognised that sector policies have territorial impacts, thus policy impact assessment plays a key role in EU policy design and implementation.

The global economic crisis led the European decision makers to refine the EU territorial policies so their impact was balanced between efficiency and effectiveness. The assessmet and measurement of the territorial and regional impact (i.e. impact assessment) of EU sector policies and directives that have already come into force across Europe.

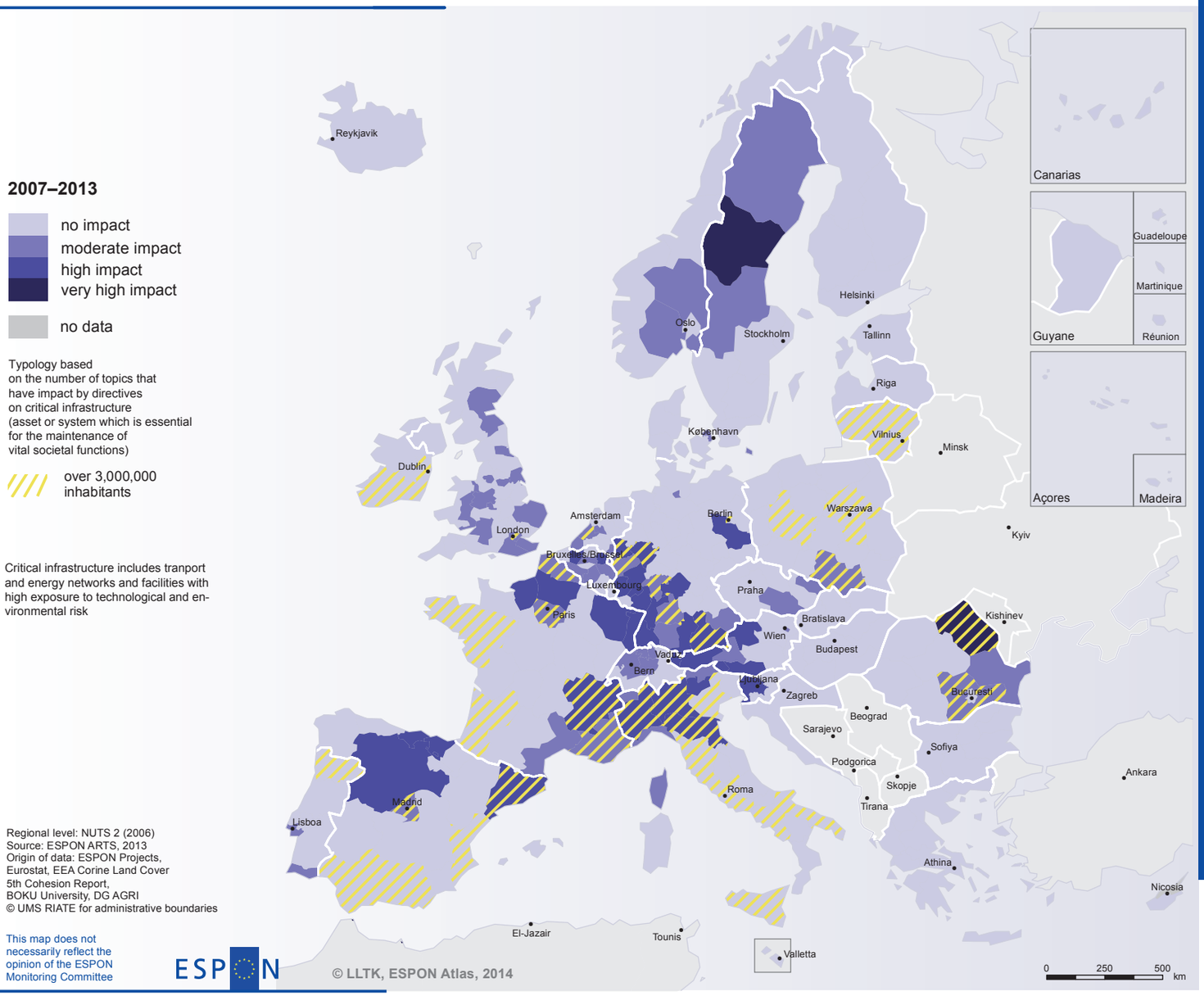
By assessing the impact of EU sector policies and directives, detailed evidence may be provided to decision makers about the advantages and disadvantages of a policy choice or approach. Furthermore, it can give a precise recommendation on what level of territorial units must the policy be applied, explains why actions should be immediately performed, and why the proposed response is appropriate. In some cases the results can lead experts, stakeholders and decision makers to reconsider policies which may appear to be irrelevant or ineffective.

Transport policy aims to connect the continent between East and West, North and South and to promote economic growth. Transport policies have a positive impact overall throughout Europe, thanks to adequate new infrastructure provision and to processes of growth diffusion. In some areas, provision is improved by leaps and bounds compared to previous accessibility conditions; moreover, these improvements will be highly desirable for areas having economic problems. It looks relevant to highlight the emerging reality of a new central European macro-region, encompassing Southern Poland, Czech Republic, Eastern Austria, Western Slovakia and Hungary.

The Common Agricultural Policy (CAP) is structured around two pillars. In Pillar 1, farm incomes are supported through direct payments to farmers and market support measures, and in Pillar 2 agri-environment and rural development objectives are in focus.

Analysis suggests that agricultural policy has a mixed impact. On the one hand, agricultural policy has a negative impact on regional GDP due to the decrease of incoming transfers to farmers, except for regions benefiting from Pillar 2 (rural development allocations) resources. On the other hand, it has a positive impact on tourism, which is regarded as an important and growing activity in rural areas. This is because tourism is connected to agricultural policy which through influencing land management practices can improve the landscape. In this context, the diversification of farming activities (e.g. tourist services) can also be regarded as an indirect indicator of innovation or entrepreneurship.

Impacts of directives on critical infrastructure



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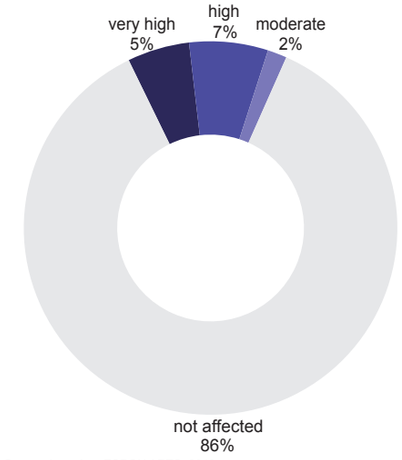
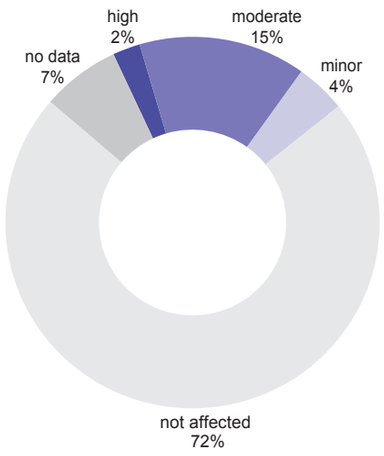
Share of European population affected by different directives

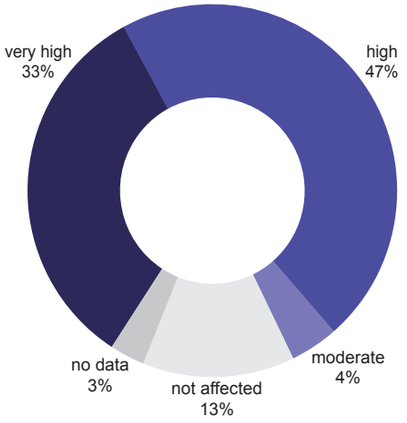
Directive on sustainable use of pesticides
Healthy life expectancy at birth, 2007–2013



Directive of clean and energy-efficient road transport
Employment in the secondary sector, 2007–2013



Directive of energy performance of buildings
Fossil fuel consumption, 2007–2013



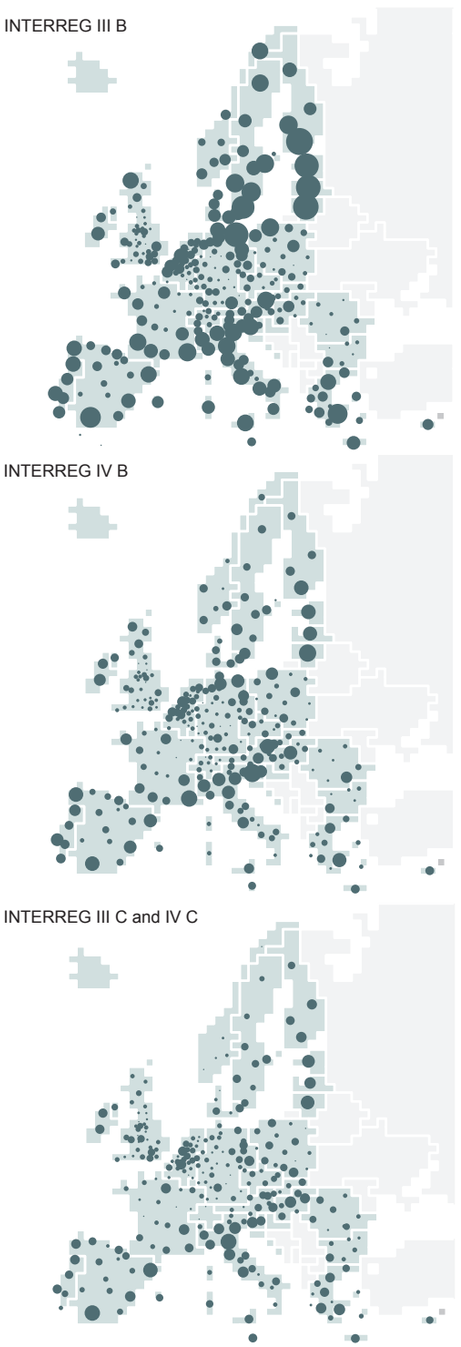
Source: based on ESPON ARTS, 2013

Territorial cooperation towards the long term objectives of territorial cohesion

18,800

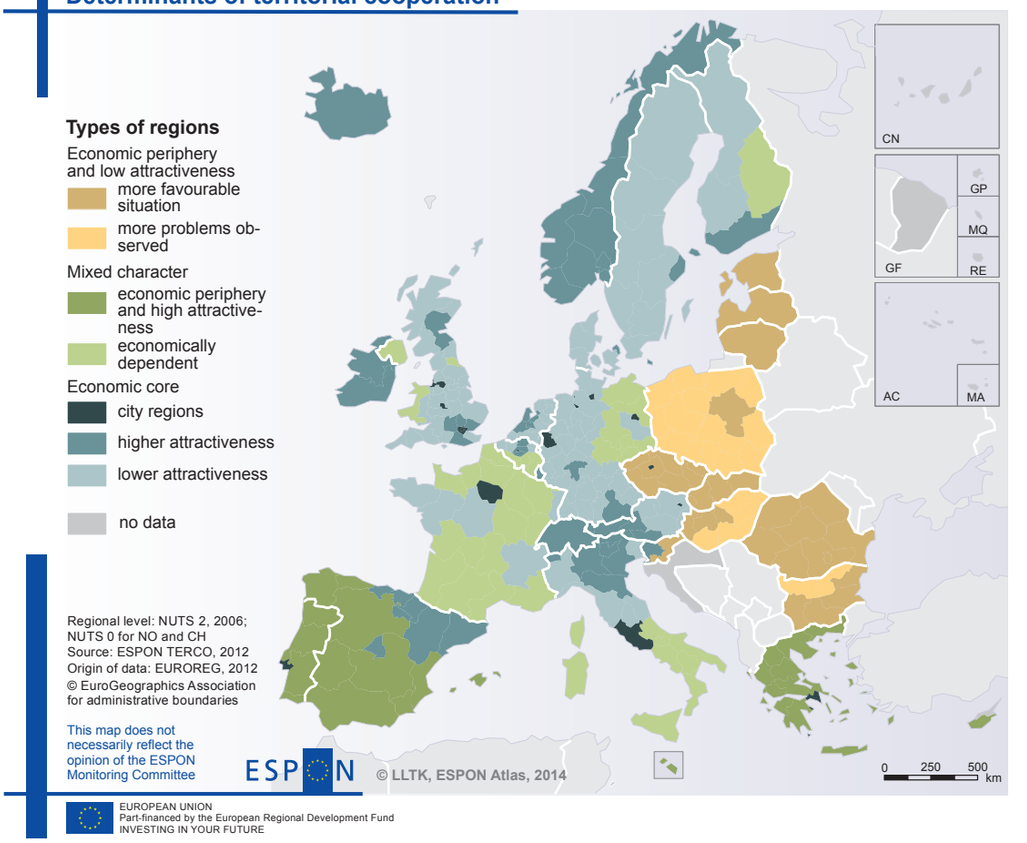
project partners have contributed since 2002 to European integration by participating in transnational projects in INTERREG III B and C and INTEREG IV B and C.

Participation in transnational cooperation



Source: ESPON TERCO, 2012

Determinants of territorial cooperation



Enhanced economic development perspectives are generally among the main justifications for territorial cooperation initiatives. Competitiveness and territorial integration have been proven to be successful in reducing negative border effects between the Member States of the European Union. However, the success of the different territorial cooperation initiatives has not always been obvious. This is because policies and interventions often struggle to reach tangible solutions, even though there are promising signs of success at European level. Successful projects lead to knowledge sharing and to joint socio-economic development amongst all stakeholders. Recent research highlights the fact that the influence of territorial cooperation is greater on the quality of life, quality of natural environment, and service provision, than on economic growth and job creation. These results may lead policy makers to revise their approaches to cooperation. They may be focusing on additional effects, which sometimes can contribute positively to various flows and exchanges that facilitate development. Amongst these, the most notable impacts are on tourism, educational exchange and commuting. For any cooperation to be successful, quite often simpler forms of collaboration, including knowledge exchange, sharing good practice or sharing tools to deal with common problems can be quite effective.

In terms of the determinants of cooperation, ESPON regions are classified into three different groups. A first group includes “economic periphery & low attractiveness” regions, such as Central and Eastern European regions. A second group includes “mixed character” regions and represents a ‘wider heterogeneity’ from an economic point of view. The third group includes, the best performing regions or the so called “economic core”. This type of regions can have further subtypes, as significant differences may arise. One such subtype is “direct core regions”, which comprises metropolitan areas. But also in the most advanced countries regions exist that are classified as “economically dependent” regions.

Territorial cooperation is so diverse that it cannot be analysed only by its core determinants, therefore other perspectives shall be taken into account. It seems quite reasonable to differentiate them according to the prevailing type of cooperation: Cross-border, Interregional, Transnational, Transcontinental Cooperation and Twinning Cities

In the regions of modest economic potential, territorial cooperation is well advanced. This goes especially in the “peripheral” regions, in particular in Central and East European countries but also in the regions of Southern Europe, which are likely to benefit from the transfer of knowledge from the core regions. Secondly, the “attractive” regions are more engaged in cooperation as part of the INTERREG programme. In this case, tourism can be an important element of their economic base. Thirdly, the “economically dependent” regions are less engaged in cooperation, which suggests their low funding potential or their preference of other priorities being chosen by the local governments. Fourthly, in the case of “metropolitan” regions, a high percentage of municipalities forming these regions are involved in cooperation, which could be facilitated by their good transport accessibility; for example the presence of a major international airport.

The majority of regions classified as “economic core”, are determined as average in terms of cooperation. On the other hand, the regions of Central and Eastern Europe are more deeply involved in twinning city cooperation, due particularly to their relatively small economic potential. Conversely, the regions of the peripheral countries of Southern Europe are more interested in cooperation reaching beyond the ESPON area and in cooperation funded as part of the INTERREG programme. In contrast, the economically dependent regions were not significantly involved in such cooperation.

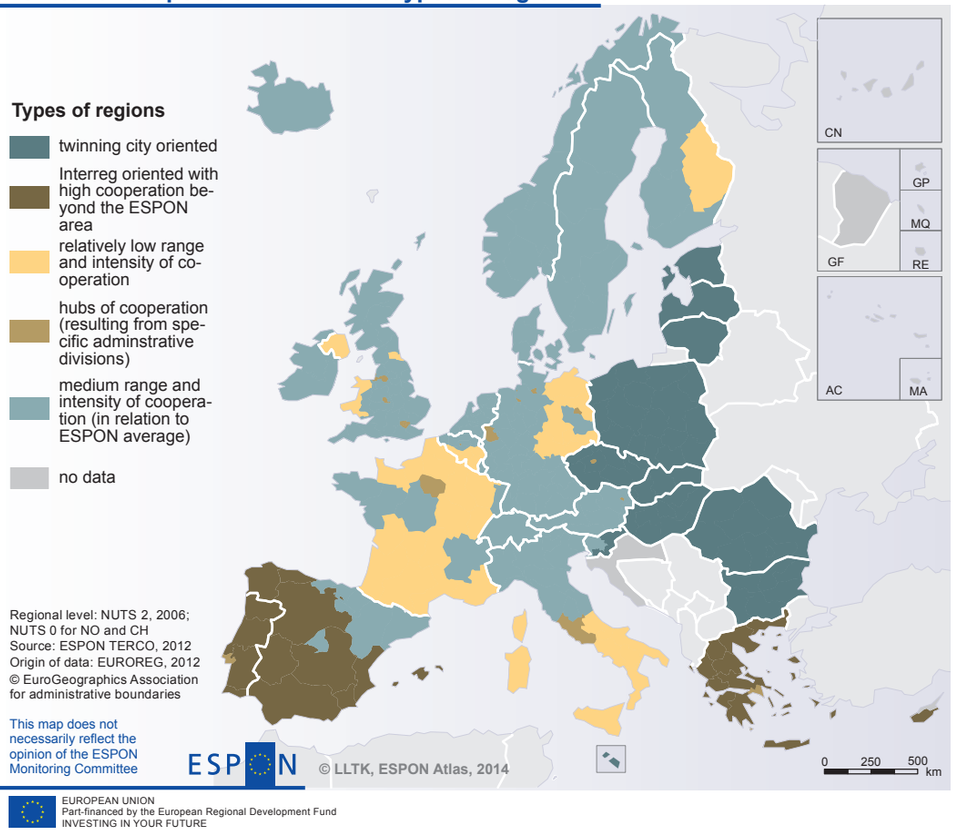
The INTERREG programme represents a broader type of territorial cooperation, and as a result, the ESPON regions show a more diverse pattern. Interregional cooperation involves non-contiguous regions across the whole territory of the EU. Activities take place as part of European Regional Development Fund (ERDF) funded projects. The programmes are quite diverse, both in terms of the number of implemented INTERREG projects and the number of partners, but also in terms of the number of NUTS2 regions where the partners are based. There is also a diversity of indicators characterising the programmes, such as the average number of partners per project, and the number of projects per region in which projects were implemented.

Generally, more INTERREG projects are located in the peripheral rather than the central part of the ESPON area. For example the INTERREG IIIB Baltic Sea Region programme has the highest activity rate according to the number of project partners. A large number of projects are also typical for regions located in the Mediterranean or the Atlantic Ocean region – in this case the projects were implemented within more than one programme. In some countries, e.g. Germany and Poland, there are significant differences concerning regional participation in INTERREG programmes. Coastal regions have a higher activity rate with a large number of project partners, but in the hinterland, the number of project partners was significantly smaller. Seaside regions and Atlantic regions tend to have greater interest in cooperation. However, in the Baltic Sea basin cooperation is relatively lower.

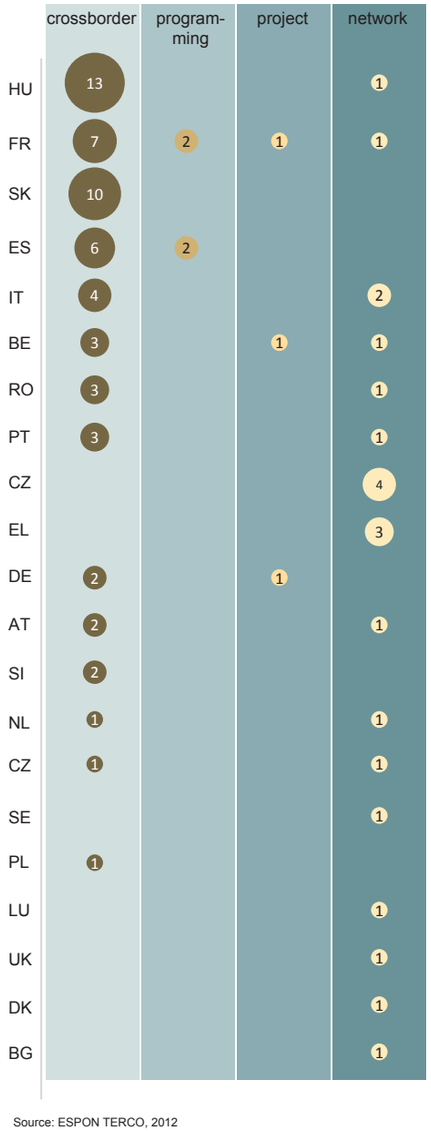
An important determinant spatial pattern of transnational cooperation in Europe is the location of project leaders. They have decisive influence on the subject of projects, higher level of finance and therefore greater capacity to coordinate. It is also important to consider that the project leader has large freedom in selecting partners. This is why it is important to analyse the spatial pattern of lead partners. In the INTERREG IIIB and IVB projects a small number of leaders come from Eastern Member States. This emphasises the predominance of cooperation within this initiative by partners from Western and Southern EU countries, which are concentrated only in a few regions. This is possibly due to a lack of experience in project management in the Eastern Member States.

In order to understand better the spatial diversity of cooperation, it is worth looking at the relative data available, which is the comparison of the number of project partners with the population of regions. By this measure the intensity of involvement in

Territorial cooperation in different types of regions

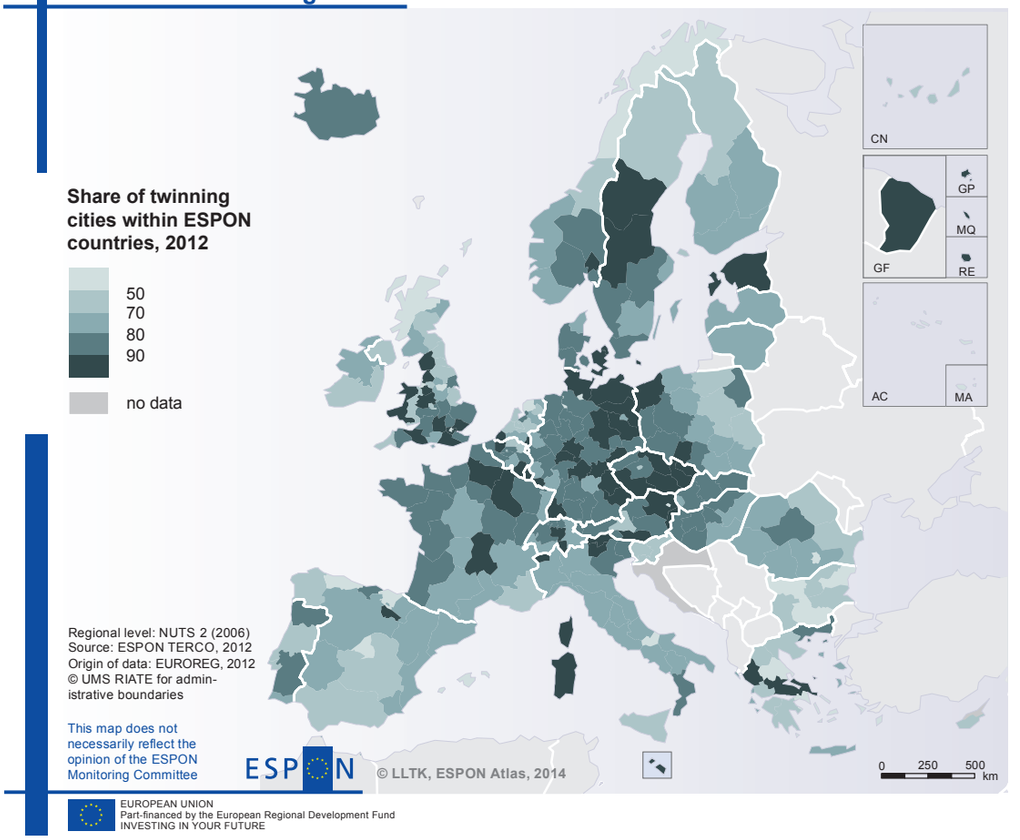


European Groupings of Territorial Cooperation (EGTC) by types

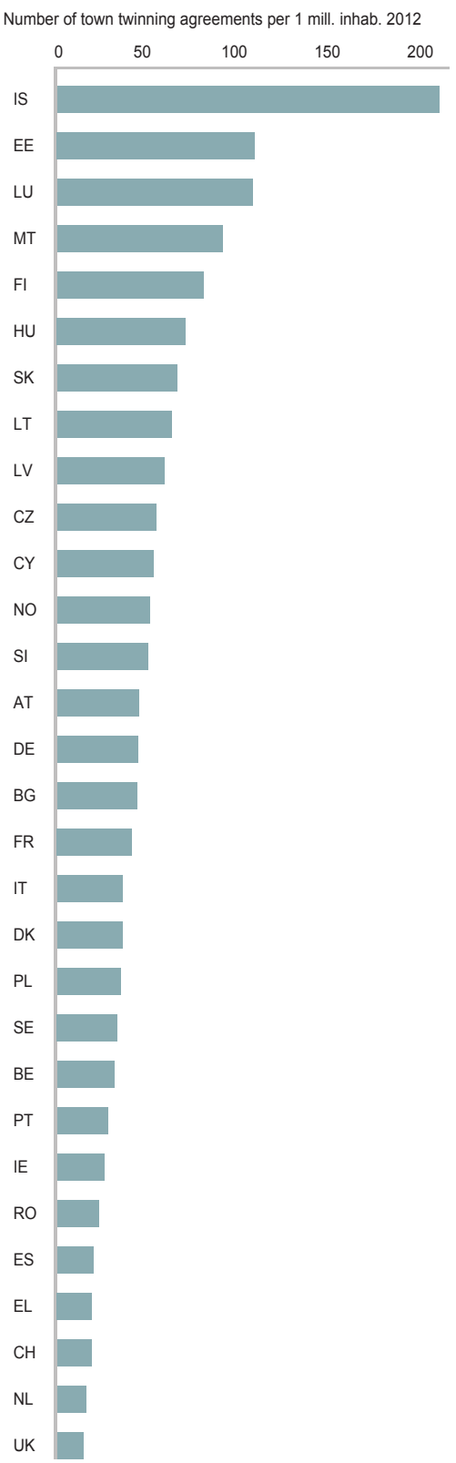


Source: ESPON TERCO, 2012

Intra ESPON twinning cities



Twinning cities cooperations



Source: ESPON TERCO, 2012

cooperation within regions can be analysed. The highest values are dominant in regions with large numbers of projects, but also those with small population e.g. the Nordic regions in peripheral locations. The continental centre reflects relative small activity in project implementation. A similar image becomes visible when the number of INTERREG projects is compared to the regional GDP. From an economic perspective, the Central and East European regions or the Iberian Peninsula are doing well.

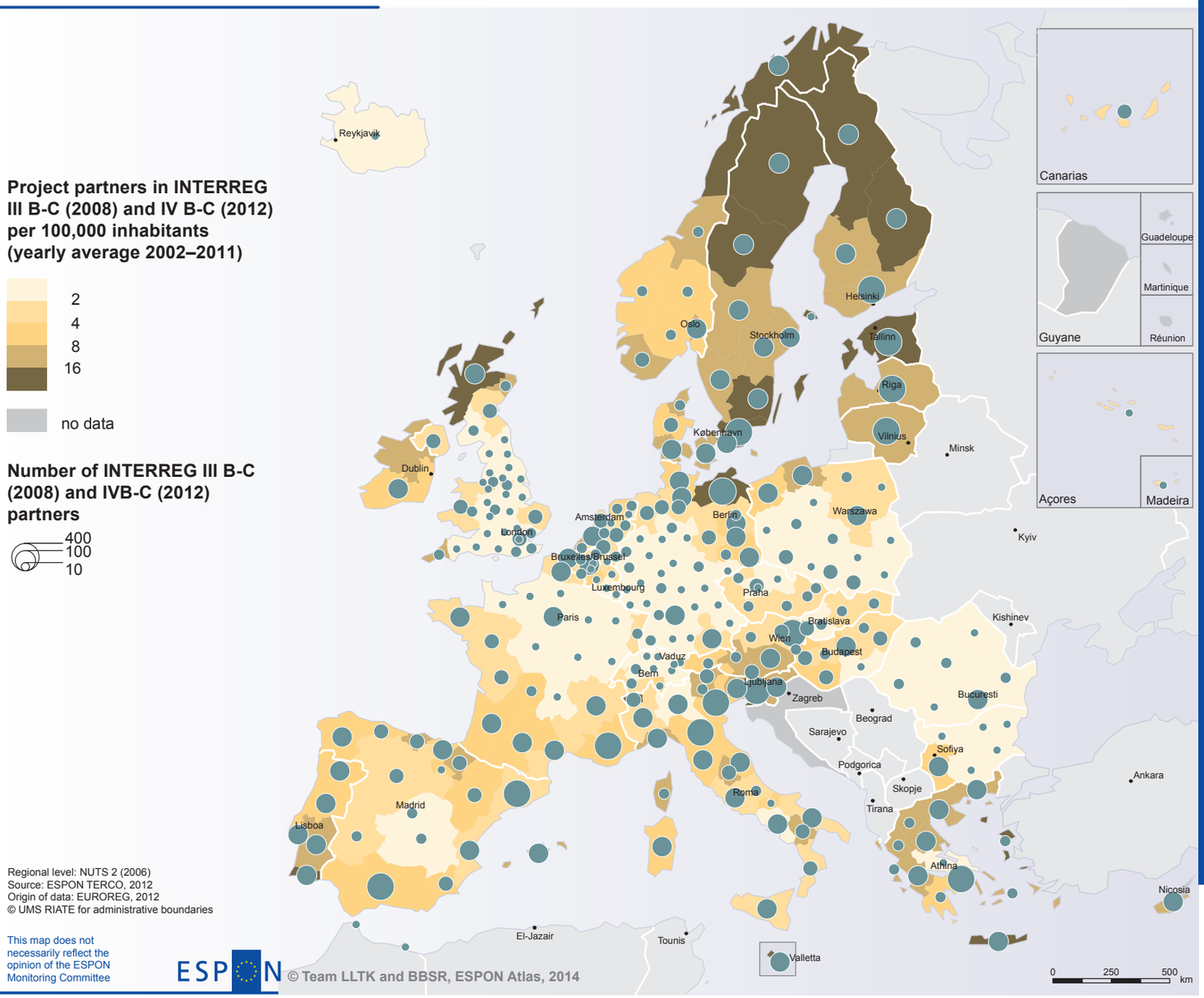
In terms of new opportunities for cooperation, the European Union created an opportunity for members to establish European Groupings of Territorial Cooperation (EGTC), bodies with legal personality. Thus, an EGTC is a cooperation instrument at the community level established for the creation of collaborative groups in order to overcome the administrative obstacles hindering territorial cooperation. As a key property, most of the EGTC regions take part in cross-border cooperation, but many countries are also involved in network-type EGTCs. Large countries such as France or Spain, and some new Member States like Hungary, Estonia or Slovakia have reached so far the highest level of activity in EGTCs.

Twinning is a flexible instrument for cooperation, and may take place between small villages, towns, counties or big cities. Its main objective is to exchange knowledge, experience, good practice, share tools to tackle common problems and common actions to solve local problems.

The number of twinning cities agreements depends on the size of the country, and in particular on the number of cities, towns or villages that intend to enter into such agreements. In the majority of European regions only a small percentage of cities, towns or villages have twinning agreements. The most active administrative units in twinning arrangements are in Scandinavian and Benelux countries. Generally speaking twinning city cooperation mostly favours large cities; the smaller municipalities have less opportunity to take part. Comparing the number of twinning cities agreements to the regional GDP, there is a relatively high share of countries from Central and Eastern Europe. There is a high number of cooperation agreements but a relatively low regional GDP.

It has been noted that twinning is more active between cities which are geographically close, but historical and cultural factors are also determining. Greater involvement in cooperation outside the ESPON countries is more typical in regions of the European peripheries. Twinning cities with communes and cities of the United States are significantly more frequent in the west of the continent; particularly noticeable is the involvement of the Irish local governments in the cooperation with communes and cities in the USA. Latin America, Spain, Portugal are particularly active, which reveals the importance of cultural roots, and common history. Cooperation with Russia and Ukraine is determined not only by the cultural dimension, but also by the geographic proximity.

Regional participation in INTERREG



Regional level: NUTS 2 (2006)
Source: ESPON TERCO, 2012
Origin of data: EUROREG, 2012
© UMS RIATE for administrative boundaries

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ESPON © Team LLTK and BBSR, ESPON Atlas, 2014

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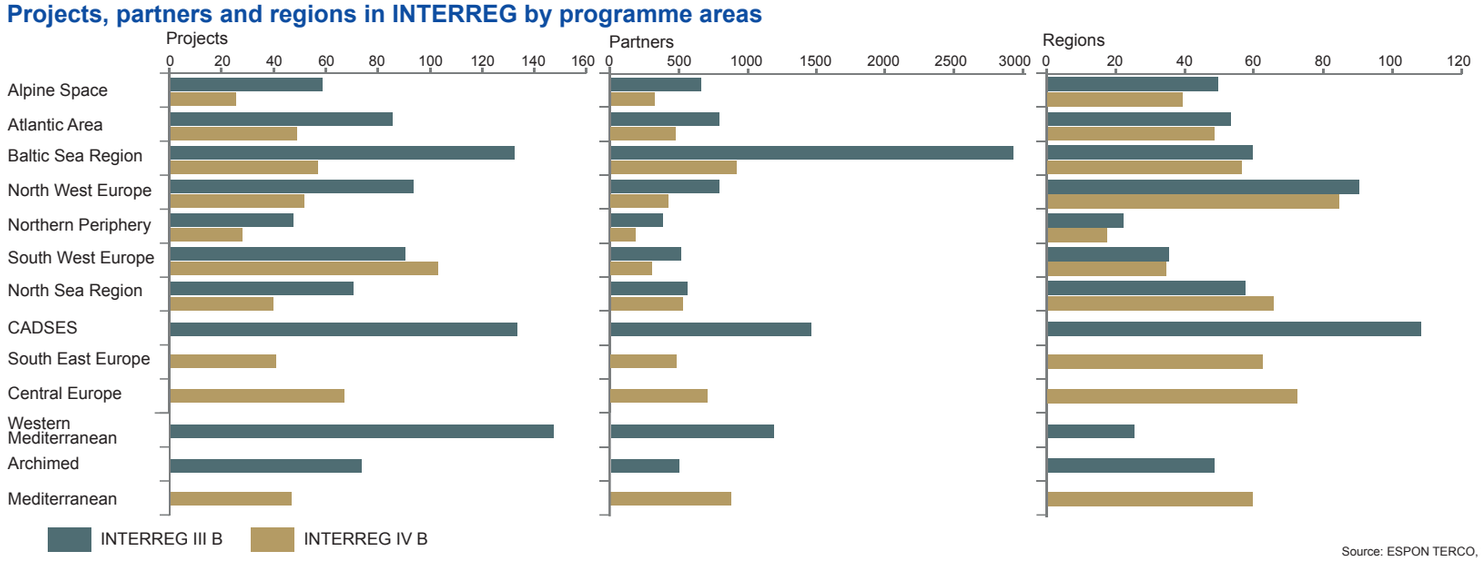
Projects, partners and regions in INTERREG by programme areas



Source: ESPON TERCO, 2012

Governance, territorial cooperation and EU Policies – territorial synopsis

Over the past 10 years, the most important wave of enlargement of the European Union (EU) resulted in an increase by 13 Member States. The accession of the Member States meant that the EU expanded its territory, generating economic and social inclusion with all of the advantages of more open borders.

The Member States are at different levels of development. This, as well as the geographical location of some Member States, especially those of the island states, determines the opportunities for territorial cooperation or the effects which different policies may impact on them. In regional cooperation the Eastern Member States are sometimes more active compared to the Western Member States. Increased cooperation amongst the Eastern Member States can also be attributed to the experience they have accumulated in pre-accession funds. This is reflected in the fact that a relatively large number of partners from these countries is involved in INTERREG programmes. Although they are not necessarily undertaking a leading role yet, the partners from the East European Member States have learned fast and have adapted well very quickly.

Some of the Memeber States of the 2004 accession round cover relatively small geographical areas, but have a relatively large number of regions with borders to other Member States. It should be noted that the links with the neighbouring countries have also been strengthened due to the ethnic minorities living in these countries.

Another characteristic of the Member States in Eastern Europe is the large number of twinning city partnerships which they have formed since their accession to the EU. Although twinning city partnerships are considered to have a low level of intensity regarding territorial co-operation, the Western EU Member States' core areas could play a greater role in encouraging and strengthening territorial cooperation, experience in polycentric territorial cooperation of cities is one aspect releted to this.

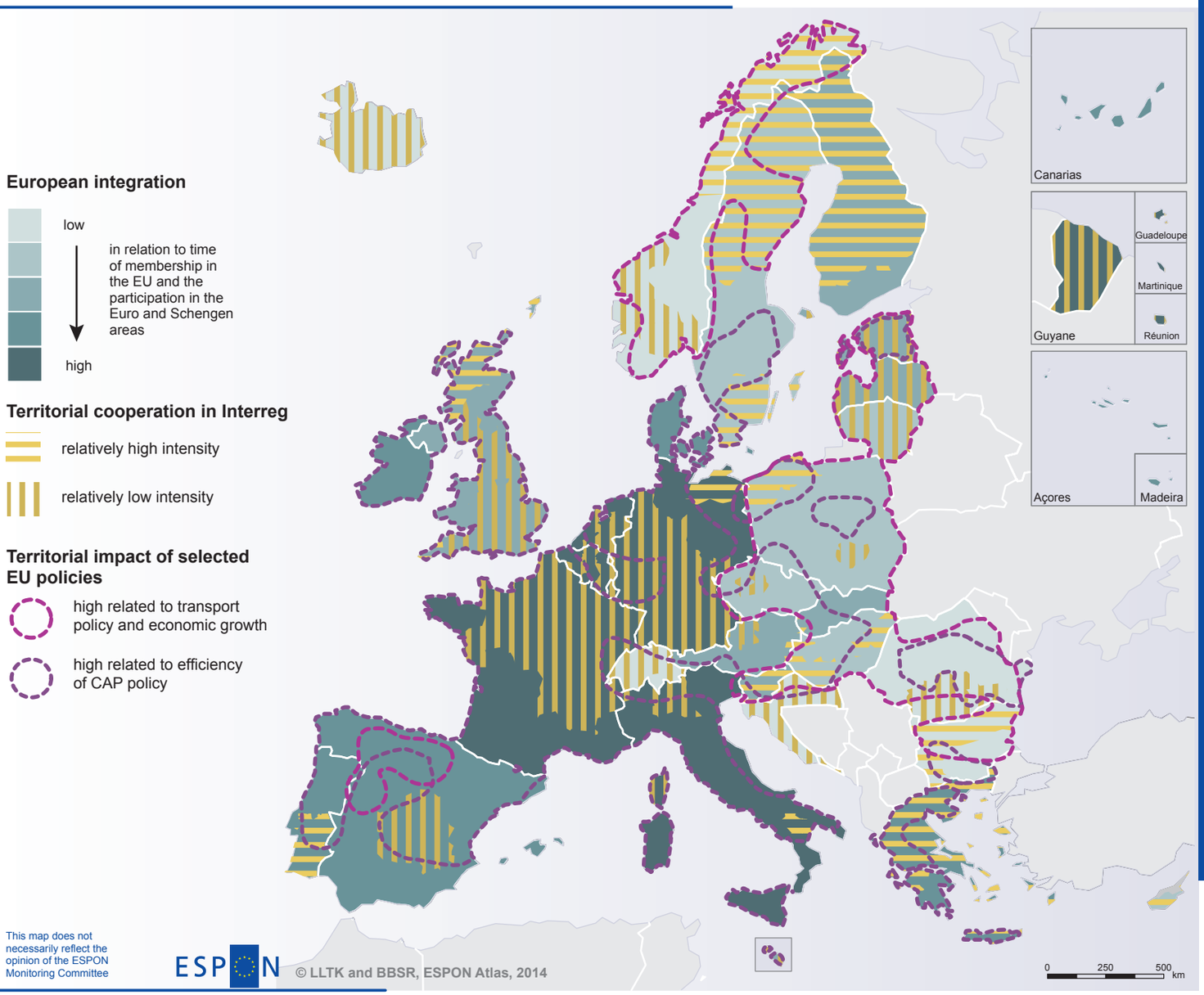
As a consequence of different levels of development, certain policies have distinct roles and different impacts on countries and regions in Europe. The EU common agricultural policy (CAP) as one of the most influential policies has a relatively modest impact on economic growth in the majority of regions. However, its alternative effects can be observed on environmental quality. Mainly positive outcomes are visible in Southern and Western European regions, with strong country effects due to the national management of funds allocation in the rural development policy. The lowest impacts are visible on the Eastern Member States.

Transport policies achieve greater impact especially in the economically and infrastructural developing regions (e.g. a greater impact is shown in Eastern Europe) and in some Northern peripheral regions.

Future enlargement requires further strengthening of the role of the EU in policy-making. Although, the enlargement increases the heterogeneity of the Union, it is important to identify and analyse the territorial impact of EU policies and directives in order to focus more accurately on their different territorial impacts.

Strengthening of integration enhances territorial co-operation directly. The Member States engage with different degrees of intensity in cooperation. In order to encourage the less active partners to cooperate, the more active partners have to share their experiences with them. In some cases economic challenges may be the result of peripherality, thus territorial co-operation shall contribute to the convergence of these regions, to ensure the strengthening of European cohesion.

Governance, territorial cooperation and EU Policies – territorial synopsis



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IX. Territorial perspectives

Europe is embedded in a world of emerging economies, fast population growth and mass migrations towards large megalopolises, exponential increases of flows of information, goods, energy and all kind of resources. Hundreds of millions of people are moving from poverty to middle class worldwide but, at the same time, absolute social and regional disparities grow in the most developed world, and also across European cities and regions. There are unparalleled technological prospects and major global environmental uncertainties. Increasing global threats and opportunities have an impact on policy matters and political choices Europe-wide. It will be of paramount importance to ensure that the European territory, its structure and linkages, contribute the best possible to the economic development in Europe, and to prepare a sufficiently satisfying future for all European citizens in the coming decades.

In such context a territorial vision for Europe is necessary to improve conditions for innovation, growth and jobs as well as the living and working conditions of all citizens in order to attract investments and to expand new businesses it is important to have certainty on the conditions a territory or place can and will offer. In the globalising world access and connectivity to neighbouring and global markets are of increasing importance.

It is central to human well-being to shape the living environment and to create places supporting a high quality of life, which is manageable for the household and which provides for the necessary public and private services, and amenities. It is important that the European territory offers a choice of different places as preferences and needs of people are diverse, and change over time. Ensuring that in the long term Europe offers a multitude of territories with social and environmental quality, capable of meeting different needs, is of utmost importance for the overall well-being of European citizens.

Europe's strategic policy aims are promoting smart, sustainable and inclusive growth. The success of such policy aims requires a more explicit common territorial dimension. The experience of the recent crisis shows that there is a need to adapt Cohesion policies, both in respect of the specific development conditions of each region and to the general economic situation of each moment. As such, for the 2014-2020 period a number of specific reforms have already been implemented favouring a more place-based approach. These initial reforms could form the basis for the new generation of Cohesion policies after 2020 which Europe requires to face the new challenges and opportunities ahead.

In the aftermath of the economic crisis, Europe needs more place-based policy intervention. Contributions to the EU 2020 Srategy need to come from all scales of the European territory. These contributions will vary since European regions, as well as cities, are diverse in size and functionality. The European settlement structure, with short distances between multiple urban centres in most parts of Europe, is unique at global scale and provides the territorial base for the European Union's aim of achieving balanced territorial development. At national and regional level, polycentricity is the most common vision incorporated in territorial development plans. Many countries have developed visions or development strategies for their territories. The same is the case for many regions and cities that have visions and development plans which support coherence in their policy making and decisions for their territory. Despite different planning traditions and institutional frameworks, there is a remarkable common aspiration in most spatial plans and visions developed in Europe in favour of polycentric structures.

A territorial vision at European level can serve as a common reference framework for the long-term and more consistent development of European policies, particularly for Cohesion policy in performing as an investment policy, as well as for better cross-border coordination of local, regional and national policies. A vision for the future of Europe needs to bring confidence to investors as well as coherence in policy development with territorial impact.

Source: ESPON ET2050, MCRIT, 2014

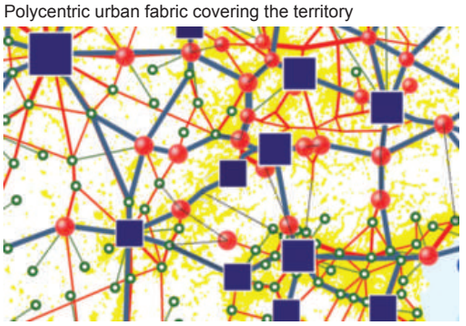
Making Europe open and polycentric

2050

is the time horizon of the Territorial Vision

Elements of the territorial vision

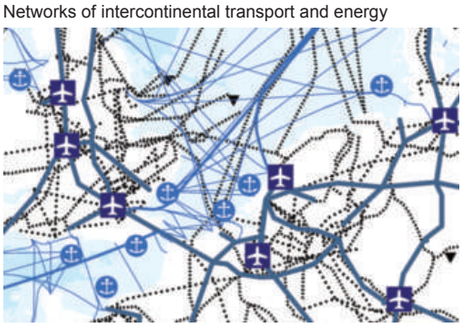
Polycentric urban fabric covering the territory



Cities and connecting infrastructure

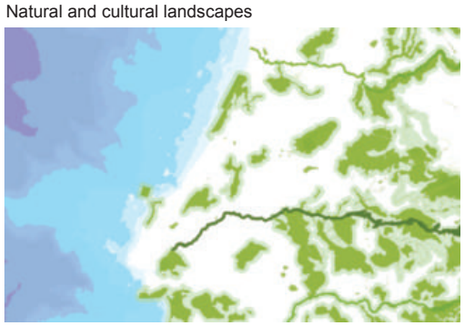
- metropoles
- large cities
- small and medium size cities
- land urbanised with high density

Networks of intercontinental transport and energy



- ports
- airports
- oil wells
- gas wells
- short-sea routes
- deep-sea routes
- oil pipelines
- gas pipelines

Natural and cultural landscapes



- natural and cultural landscapes
- buffer zones and areas above 1.000 m altitude
- main rivers as green corridors
- sea bathymetry

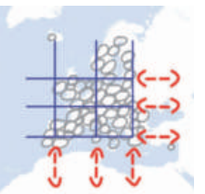
Source: ERSILIA and MCRIT, ESPON ET2050, 2014

Policy aims

Opening up European markets to global competition and promoting sustainabiltiy

Integration of transport and telecommunication networks and geographical spread of global gateways

Intelligent energy networks connecting decentralised renewal energy



Linking transport, telecommunication and energy networks between Europe and Neighbouring regions

Promoting integrated territorial development across borders

Sufficient infrastructures to open up local and regional potentials

Universal access to services of general interest

Reinforcing second tier cities as important engines of growth

Integration of functional urban regions

Smart and inclusive revitalisation of cities and neighborhoods

Protecting landscapes from urban sprawl and renaturalising cities

Sustainable management of green infrastructures to increase biodiversity and resilence

Source: ERSILIA and MCRIT, ET2050, 2014

Three alternative territorial scenarios have been developed for the future development of Europe towards 2050. The scenarios are aiming to cover extreme but realistic policy relevant futures. “Market based growth favouring large metropoles” scenario follows the EU 2020 Strategy in relation to the global competitiveness of Europe by facilitating the economic development of the largest metropolitan regions of global importance in Europe. “Public policies promoting secondary city networks” scenario follows the priority of the European Spatial Development Perspective and the two Territorial Agendas for balanced polycentric urban systems at the macro-regional or national scale. “Local and European initiatives promoting small cities and less developed regions” scenario responds to the challenges of energy scarcity and climate change expressed in the Territorial Agenda 2020. These three scenarios could form the basis for a territorial vision 2050.

“Making Europe Open and Polycentric“ is the most coherent territorial strategy supporting the economic growth and competitiveness, social cohesion and sustainability. These are goals promoted by the EU 2020 Strategy and the Territorial Agenda 2020 for the coming decades. This strategy combines growth and cohesion, and it produces liveable places for people. The efficiency and quality of the European territory lies in networking cities of all sizes, from local to global level, as well as in empowering people and local activities to maximise their own assets at European and global scale. To improve its territorial cohesion, Europe needs to become more open and polycentric, thus fulfilling the original aim of the Treaty of Rome (1956). According to the treaty, Europe had to become an open Community of equals with common strong institutions. These objectives also fulfilled the aims of later Treaties which opted for a harmonious and balanced territory.

The cartographic image of the territorial vision shall be perceived as a picture of an open Europe with closer links to territories and markets outside Europe, and a polycentric Europe where cities of different size and specialities contribute to growth and provide jobs and quality of living conditions in all parts of Europe.

The vision combines three main layers. A polycentric urban fabric covering the territory which contains alongside metropoles, large cities and small and medium size cities, three tiers of cities and appropriate connecting infrastructure. Networks of intercontinental transport and energy opening up Europe to the World include ports and airports, maritime routes and energy infrastructures. Natural and cultural landscapes sustainably managed to enhance biodiversity and resilience are based on Nature 2000 sites and main rivers used as green corridors.

The debate on a territorial vision for Europe has already started, but further debate is necessary to generate a shared ownership of the vision, as well as an anchoring in policy. The moment has come for politicians and policy makers to take the initiative, discuss and seek acceptance for a long-term territorial vision as a reference framework for Europe.

Cartographic image of the territorial vision 2050

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Regional level: NUTS 3
Source: MCRIT, 2014
Origin of data: ET2050, 2014

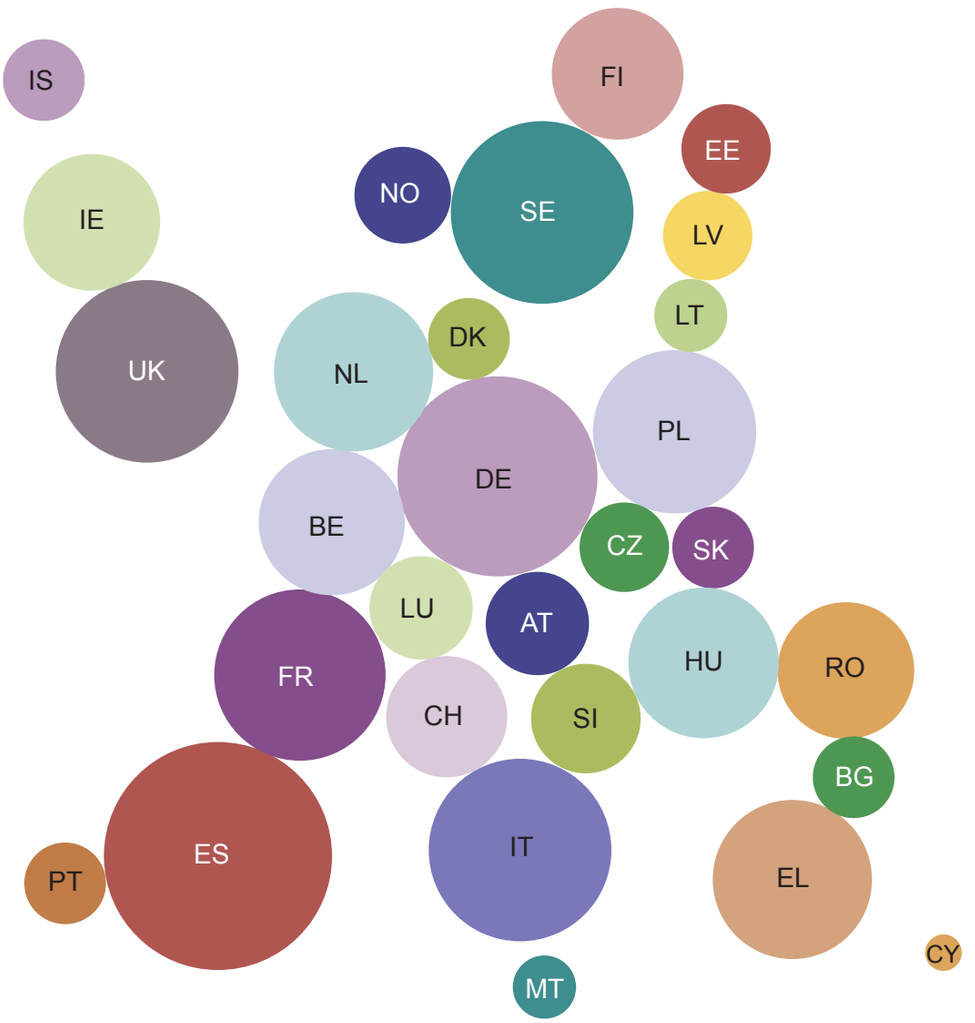
X. Addendum

Working in the ESPON 2013 Programme

392 projectpartner

66 projects

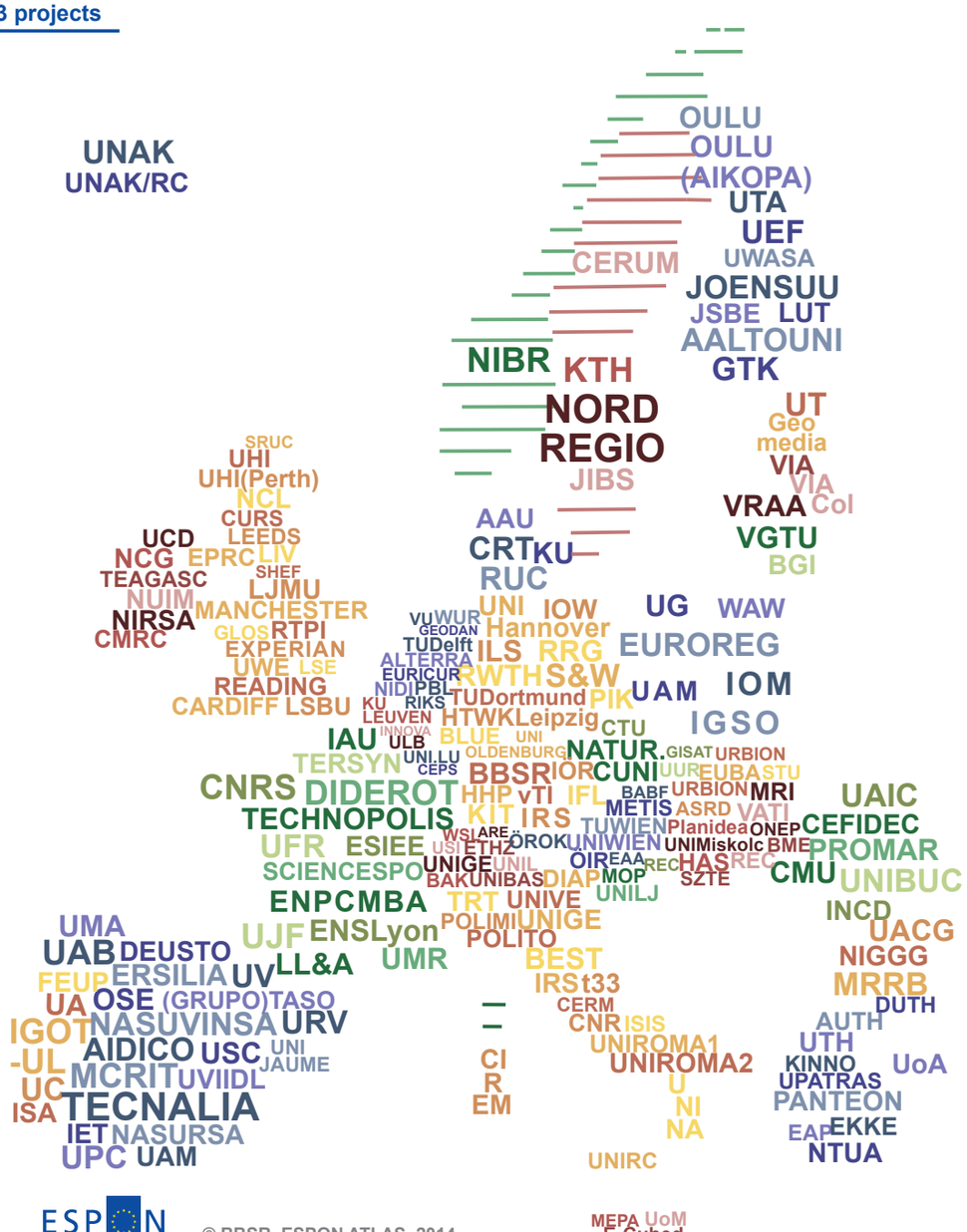
Participation in ESPON projects



Size of symbols proportional to the number of participation in ESPON-projects

Source: ESPON CU - List of beneficiaries

Partner in ESPON 2013 projects



This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

Source: ESPON CU - List of beneficiaries

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ESPON projects and acronyms

ARTS	Assessment of Regional and Territorial Sensitivity
ASEAN	Association of Southeast Asian Nations
ATTREG	Attractiveness of European Regions and Cities for Residents
CADSES	Central, Adriatic, Danubian and South-Eastern European Space
CAP	Common Agricultural Policy
DEMIFER	Demographic and Migratory Flows Affecting European Regions and Cities
DG MARE	Directorate-General for Maritime Affairs and Fisheries
DG REGIO	Directorate-General for Regional and Urban Policy of the European Commission
ECR2	Economic Crisis - Resilience of Regions
EDORA	European Development Opportunities in Rural Areas
EEA	European Environmental Agency
EFTA	European Free Trade Association
EGSS	Environmental Goods and Service Sector
EGTC	European Grouping of Territorial Co-operation
ERDF	European Regional Development Fund
ESaTDOR	European Seas and Territorial Development, Opportunities and Risks
ESDP	European Spatial Development Perspective
ESPON	European Observation Network for Territorial Development and Cohesion
ESPON Climate	Climate Change and Territorial Effects on Regions and Local Economies in Europe
ET2050	Territorial Scenarios and Visions for Europe
EU2020	Europe 2020 Strategy
EU-LUPA	European Patterns of Land Use
FDI	Foreign direct investment
FIRE	Finance, insurance, real estate
FOCI	Future Orientation for Cities
FUA	Functional Urban Area
GDP	Gross Domestic Product
GEOSPECS	Geographic Specificities and Development Potentials in Europe
GHG	Greenhouse gas
GREECO	Territorial Potentials for a Greener Economy
ICT	Information and communication technology
INTERCO	Indicators of Territorial Cohesion
IPCC	Intergovernmental Panel on Climate Change
ISCED	International Standard Classification of Education
KIT	Knowledge, Innovation, Territory
LAU	Local Administrative Unit
LUZ	Larger Urban Zone(s)
MEGA	Metropolitan European Growth Area
Mtoe	Million tons of oil equivalent
MW	Megawatt
NAFTA	North American Free Trade Agreement
NBIC	Nanotechnology, biotechnology, information technology and cognitive science
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Development and Co-operation
PPS	Purchasing Power Standard
R&D	Research and Development
RIO+20	United Nations Conference on Sustainable Development in Rio de Janeiro 2012
SeGI	Indicators and Perspectives for Services of General Interest in Territorial Cohesion and Development
SGPTD	Secondary growth poles in territorial development
SIESTA	Spatial indicators for a Europe 2020 Strategy Territorial Analysis
TA2020	Territorial Agenda 2020
TeDI	Territorial Diversity in Europe
TEN-T	Trans-European Transport Network
TERCO	European Territorial Cooperation as a Factor of Growth, Jobs and Quality of Life
TFEU	Treaty on the Functioning of the European Union
TIGER	Territorial Impact of Globalization for Europe and its Regions
TIPSE	Territorial Dimension of Poverty and Social Exclusion in Europe
TIPTAP	Territorial Impact Package for Transport and Agricultural Policies
TRACC	TRansport ACCessibility at regional/local scale and patterns in Europe

Country codes

AT	Austria
AU	Australia
BE	Belgium
BG	Bulgaria
CA	Canada
CH	Switzerland
CN	China
CY	Cyprus
CZ	Czech Republic
EE	Estonia
EL	Greece
ES	Spain
EU	European Union
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IN	India
IS	Iceland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
TH	Thailand
UK	United Kingdom
US/USA	United States/United States of America
USSR	Union of Soviet Socialist Republics
VN	Vietnam

Sources

II. Urban and rural areas

Population density
Source: ESPON GEOSPECS, 2012

Urban and rural Europe

Population by different settlement types
Source: ESPON CU Typology Compilation, 2011, project data

Urban-rural typology
Source: ESPON CU Typology Compilation, 2011
Origin of data: DG Regio, 2011

Typology of metropolitan areas
Source: ESPON CU Typology Compilation, 2011
Origin of data: DG Regio, 2011

Population development by metropolitan types and selected countries
Source: ESPON CU Typology Compilation, 2011, project data

European network of cities

TOP 30 European cities in different economic fields
Source: ESPON SGPTD, 2012, Scientific Report, p. 56ff

Intra-urban population dynamics
Source: ESPON FOCI, 2010, Final Report, p. 26
Origin of data: Urban Audit, 2009

Economic structure and importance of cities
Source: ESPON FOCI, 2010, FInal Report, p. 36; ESPON SGPTD, 2012
Origin of data: Eurostat, 2007

Gross Domestic Product of selected metropolitan areas
Source: ESPON FOCI, 2010, project data; Eurostat

European poles of global integration

Control balance of foreign subsidiaries by FUA
Source: ESPON FOCI, 2010, Scientific Report, p. 189-191

Participation of FUAs in global and European networks
Source: ESPON FOCI, 2010, Scientific Report, p. 212
Origin of data: ORBIS, 2007; CARDIS, 2008

Participation of Functional Urban Areas in global and European networks
Source: ESPON FOCI, 2010, Final Report, p. 38
Origin of data: ORBIS, 2007; CARDIS, 2008

Structures and control balance of FUA subsidiaries
Source: ESPON FOCI, 2010, project data

Characteristics and potentials of rural territories

Agricultural indicators: Employment in primary sector
Source: Eurostat, 2007

Agricultural indicators: Gross value added of agrarian activities
Source: Eurostat, 2011

Agricultural indicators: Average farmsize
Source: Eurostat, 2005

The structural typology of rural regions
Source: ESPON database, 2014
Origin of data: ESPON EDORA, 2010, Final Report, p. 19

Performance typology of rural regions
Source: ESPON EDORA, 2010, Final Report, p. 20; ESPON DEMIFER, 2012
Origin of data: ESPON EDORA, Final Report, 2010, p. 20; ESPON DEMIFER, 2012

Share of dominant performance in European countries
Source: ESPON EDORA, 2010, Final Report, p. 20

III. Society and integration

Population
Source: ESPON database, 2012

Demographic change

Demographic change
Source: ESPON database, 2012

Population development
Source: based on ESPON Territorial Observation 1, 2008, p. 7
Origin of data: Eurostat, 2014

Fertility
Source: Eurostat, 2014
Origin of data: Eurostat, 2014

Development of fertility rates in Europe (selected countries)
Source: Eurostat, 2014; OECD, 2009

Life expectancy at birth
Source: Eurostat, 2014

Relation between age groups
Source: Eurostat, 2014

Demographic status
Source: ESPON DEMIFER, 2010, Final Report, Deliverable 3 (Typology of Regions), p 57; Eurostat, LFS (Labour Force Survey) 2014
Origin of data: ESPON DEMIFER, 2010; Eurostat, 2014

Characteristics of the demographic status types
Source: ESPON DEMIFER, Deliverable D3 final, p. 53 ff., 2010

Migration and mobility

Foreign population
Source: ESPON DEMIFER, 2010, Deliverable D11 (Atlas of maps for Final Report), p. 68; Eurostat, 2014

Emigration and immigration
Source: ESPON DEMIFER, 2010, Deliverable D 11 (Atlas of maps for Final Report), p. 51
Origin of data: ESPON DEMIFER, 2010; MIMOSA, 2009

Internal and international migration in the regions
Source: ESPON DEMIFER, 2010, Final Report, p. 6
Origin of data: Eurostat, NSIs, 2009; EU Labour Force Survey, 2007

Strong relative sex overrepresentation
Source: based on ESPON DEMIFER, 2010, Deliverable D 11 (Atlas of maps for Final Report), p. 81

Age group-dependent migration to/from city regions
Source: ESPON ATTREG, 2011, Scientific Report, p. 52 ff.

Migration flows between ESPON countries
Source: MIMOSA, 2009

Education and labour force

Participation in education and training: Participation of adults in training
Source: Eurostat, 2014

Participation in education and training: University students
Source: ESPON ATTREG, 2011, Scientific Report Annex 2 (Atlas), p. 33

Participation in education and training: Early school leavers
Source: Eurostat, 2014

Highly qualified population
Source: ESPON INTERCO, 2012, project data
Origin of data: Eurostat, NSIs, 2012

Educational services
Source: ESPON SeGI, 2012, Scientific Final Report, p. 119
Origin of data: ESPON SeGI, 2014

Creative workforce – employment in creative class
Source: ESPON ATTREG, 2011, Scientific Report Annex 2 (Atlas), p. 23

Labour market

Employed persons per age groups
Source: Eurostat, 2014

Employment
Source: Eurostat, 2014
Origin of data: Eurostat, 2014

Unemployment
Source: Eurostat, 2014
Origin of data: Eurostat, 2014

Change in unemployment
Source: Eurostat, 2014

Gender imbalances in unemployment
Source: based on Eurostat, 2014

Poverty and social exclusion

Poverty indicators: Low work intensity
Source: Eurostat, 2014

Poverty indicators: Severe material deprivation
Source: Eurostat, 2014

Poverty indicators: Disposable income
Source: Eurostat, 2014

Risk of social exclusion
Source: based on Eurostat, 2014
Origin of data: Eurostat, 2014

Risk of poverty and social exclusion
Source: based on Eurostat, 2014
Origin of data: Eurostat, 2014

Housing indicators
Source: ESPON SeGI, 2012, Draft Final Report Annex 5, p.73-74; Eurostat, 2014

Typology of poverty and social exclusion
Source: ESPON TiPSE, 2014, Final Report, p. 2

IV. Economic structures and global challenges

Regional Gross Domestic Product (GDP)
Origin of data: Eurostat 2014

Regional economic structure

Employees in sectors
Source: Eurostat, 2013

Dominant sectors of employment change
Source: Eurostat, 2013
Origin of data: Eurostat, 2013

Typology of regional economies
Source: based on ESPON TeDI, 2010, Final Report, p. 176
Origin of data: Eurostat, 2012

Share of clothing in export in Southern European ESPON countries
Source: ESPON TIGER, 2011, project data

Production of motor vehicles in selected countries
Source: ESPON TIGER, 2011, project data

NBIC specialization index of the best FUA
Source: ESPON SIESTA, 2013, Draft Final Report, p. 52

Regional economic performance

GDP per capita
Source: Eurostat, 2014

GDP growth
Source: Eurostat, 2014
Origin of data: Eurostat, 2014

Lisbon performance and regional economic development
Source: ESPON Territorial Observation 3, 2010, p. 10
Origin of data: Eurofutures Finland, 2009; Eurostat, 2014

GDP and population by composite Lisbon performance
Source: based on ESPON Territorial Observation 3, 2010

Regional GDP per capita and composite Lisbon performance

Source: based on ESPON Territorial Observation 3, 2010

Regional dimensions of the economic crisis

Development of employment by economic activity
Source: Eurostat, 2014

Employment resilience
Source: ESPON ECR2, 2014, Draft Final Report, p. 23
Origin of data: Experian, Eurostat, various dates

Development of GDP after the economic crisis
Source: Eurostat, 2014
Origin of data: Eurostat, 2014

Development trends in different regional types of employment resilience to crisis
Source: based on ESPON ECR, 2014, project data
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Origin of data: RRG GIS database, 2014

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Renewable energy potential: Potential for electricity production from photovoltaic panels
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Source: ESPON GREECO, 2013, Final Report, p. 55

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Territorial impact of Common Agricultural Policy (CAP)
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IX. Future territorial perspectives

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Source: ESPON ET2050, 2014, ESPON publication of the territorial vision, p. 2

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Source: ESPON ET2050, 2014, ESPON publication of the territorial vision, p. 20

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Source: ESPON ET2050, 2014, ESPON publication of the territorial vision, p. 13 ff.

Cartographic image of the territorial vision 2050
Source: ESPON ET2050, 2014, ESPON publication of the territorial vision, p. 21

X. Addendum

Working in the ESPON 2013 Programme

Participation in ESPON projects
Source: ESPON CU – List of Beneficiaries

Partner in ESPON 2013 projects
Source: ESPON CU – List of Beneficiaries

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The ESPON 2013 Programme supports policy development in relation to the EU 2020 Strategy, EU Cohesion Policy and the Territorial Agenda 2020 for the European territory. ESPON provides territorial evidence that includes comparable information on regions and cities, analyses of trends and impacts of policies, scenarios on territorial prospects, data, indicators and tools that can help policy makers and practitioners in applying a European or even wider territorial perspective on the territorial capital and development potentials of their region, city or larger territory.

The ESPON Atlas 2013 is based on ESPON results available by August 2014. It is making particular efforts to illustrate and accompany the discussion of Europe's territorial diversity.

The purpose of the ESPON Atlas is to communicate the findings of the ESPON 2013 Programme on territorial structures and ongoing dynamics. Citizens, students, interested researchers, practitioners and policy makers are very welcome and invited to study and use the provided territorial evidence in form of maps and infographics.

All research results, data, indicators and tools of the ESPON 2013 Programme are available for free on www.espon.eu.

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