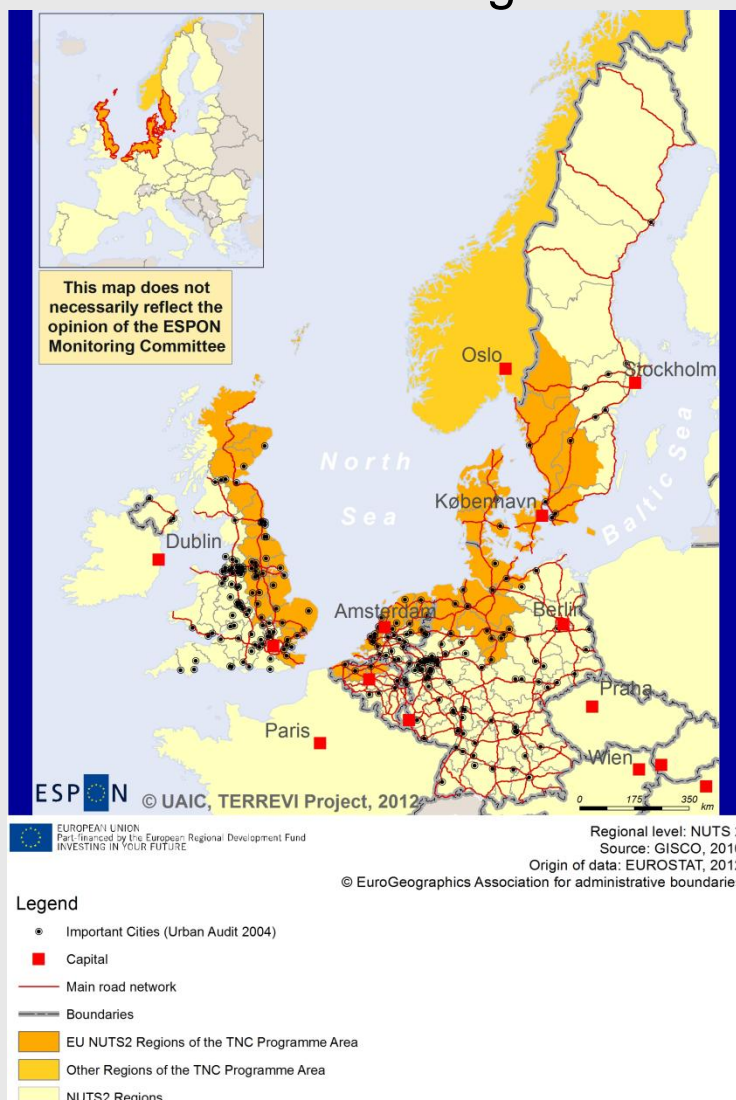


ESPON Evidence Report North Sea Region



ESPON Project TerrEvi

August 2013

This report presents a more detailed overview of the analytical approach to be applied by the project. This "Scientific Platform and Tools" Project is 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 EU27, 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.

This basic report exists only in an electronic version.

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Executive Summary

The ESPON TerrEvi project aims at providing evidence for Structural Funds programmes to support the development of the programmes planned for the period of 2014-2020. The present territorial Evidence Report is one of ten case studies. This Evidence Report has been complemented by the results of the discussions with the North Sea Programme at the February 2013 workshop. The present report assesses the situation of North Sea in view of developing a future programme and achieving the three objectives of the Europe 2020 Strategy, namely smart, sustainable and inclusive growth.

Generally, the workshop participants expressed the need for ESPON material to help them justify their choice of Operational Programme thematic objectives. Two important aspects have been considered crucial, the detailed explanation and understanding of indicators and their regular update. Furthermore, regarding the territorial coverage, participants argued that it would be efficient for programmes to have access to less aggregated data, possibly provided at the level of NUTS3 regions and main urban hotspots.

Context information

The North Sea area is one of the most developed transnational area with GDP/inhabitants values of some Programme NUTS 3 being the highest at European level. The North Sea region encompasses mainly well performing NUTS3 regions in terms of economic development. Nordic countries (Norway, Sweden, Denmark) and the Netherlands generally have higher values compared to the European average. North-eastern England is a periphery both in national and transnational context. British and German infranational disparities are high. Furthermore, it is to notice that wealth is mainly concentrated in cities e.g. Randstad in Holland, Edinburgh and Aberdeen in Scotland.

Within the North Sea Region one can notice the presence of an attractive zone inside the countries affected by a demographical decrease, i.e. Skåne in Sweden, region centred on Malmö, with a growth of almost 4% and Flevoland in the Netherlands with similar values. United Kingdom regions have mainly positive values for various reasons e.g. international labour force migration, the closeness of urban conglomerates as Sheffield-Leeds in the region of

North Yorkshire. Scottish Highlands are reporting a big demographical reanimation process, due to internal and international migration (4-6% demographical growth, the biggest values being in Inverness-Nairn). Continental Europe shows a differentiated pattern. In Danish and Dutch regions, there are rather positive dynamics, while German regions have a negative demographic balance.

Additional indicators were included in the report following indications emerged during the workshops in order to give evidence on issues specific to North Sea.

Moreover, the timing of the TerrEvi project overlaps with the programming process, thus limiting the possibilities for the programme to benefit from the project results.

Europe 2020: Smart growth – main findings

- Expenditures on research and development are considered a driver of economic growth. Investing 3% of GDP for R&D is therefore one of the headline targets of Europe 2020. Private businesses are supposed to contribute to reaching the target. The programme area mainly shows average values for both overall R&D expenditure as well as R&D expenditure in the private sector.
- Concerning the NBIC, the North Sea Region is largely characterised by a strong specialisation of the research centres. Highly specialised FUAs tend to be concentrated in the Programme area northern periphery i.e. UK and Nordic countries.
- Knowledge-intensive services comprise a broad set of activities. The shares within the North Sea Region vary between 34 and 58.93%, with capital regions having the highest shares. Regional disparities in the North Sea Region must be seen in combination with local specialisations, regional innovation systems or other indicators like R&D investments.
- When it comes to human resources in science and technology, the figures for the Programme area comparable to other north western European regions. North Sea Region shows high shares of human resources in science and technology, i.e. above 35%.

- Territorial patterns of innovation show a general division of labour regarding the field of innovation for the North Sea Region. The UK, Sweden, the Netherlands and Norway are dominated by creative diversification and technological application areas. Flanders and Germany are mainly applied science areas, while only Denmark entails a science-based area. In other words, The UK, Sweden, the Netherlands and Norway tend to focus on producing science-related knowledge, while Flemish, German and Danish regions rather focus on product-related innovation and creative processes.
- Referring to the implementation of the Digital Agenda of the EU, the use of e-commerce and ICT sector's employment show a significant use throughout the Programme area with high disparities between urban centres (Amsterdam, Oslo, Copenhagen) and rural areas.

The discussion with the programme illustrated that the ESPON results on smart growth can be of interest for the selection of projects and in particular for the needs analysis of the future programme. In particular the indicators on R&D expenditures, knowledge-intensive services and territorial patterns of innovation may be useful for identifying promising projects. Indicators on smart growth are difficult to use for monitoring changes within the programming period if they are not continuously updated. Another relevant factor highlighted during the discussion with the programme is the combination of various indicators at different layers (Nuts-2 and lower territorial levels). At this regard, the combination of Intramural R&D expenditures (both private and public), Territorial Patterns of Innovation and NBIC relative specialisation help describe a broader and more view of the Programme area.

Europe 2020: Sustainable growth – main findings

- Regarding wind power, the North Sea Region shows medium to high potentials. Most potential is located in Baltic Sea countries as Sweden, Finland and the Baltic States and in northern Scotland. At the same time, the North Sea Region holds good opportunities for developing wave power. From a European perspective, only the Atlantic Area shows higher opportunities.

- All regions of the North Sea Region face climate change impacts. In the programme area, only a few regions in the UK have low capacities to adapt to climate change while Nordic regions have the highest capacities as technology, knowledge and awareness are important dimensions of adaptive capacity.
- Just like the EU27+4, the North Sea Region's greenhouse gas emissions mainly concentrate in large metropolitan and urban areas.

The discussion with the programme representatives illustrated that the ESPON results on sustainable growth can be of interest for the needs analysis and thematic concentration. In particular, the indicators on wind power potential, adaptive capacity to climate change, potential impacts and vulnerability to climate change may be useful for contributing to the identification of promising projects and for stakeholder dialogues. At this regard, composite indicators should be disaggregated into their sub-components in order to identify specific needs, potential and policy opportunities. An important aspect raised during the meeting is that most indicators on sustainable growth are difficult to use for monitoring changes within the programming period, whether not continuously updated during the programme implementation.

Europe 2020: Inclusive growth – main findings

- The North Sea Region shows an employment rate above 60%; a few regions in Scotland, Sweden and Norway have a rate >75%. Long-term unemployment rates are low (<4%), even if the situation probably has been worsened by the current economic crises.
- In the North Sea Region, there are some disparities in terms of ageing of population. The general trend of population decline in north western Scotland, Denmark and German regions cannot be reversed in any possible ESPON scenario. At the same time, south eastern England, Norway and Sweden are foreseen to experience a positive labour force growth in all of the possible ESPON scenarios. High shares of old people (>65 years) particularly concern UK, Swedish and German regions.

- In the North Sea Region, a large majority of the regions enjoy rather low figures with respect to the at-risk-of-poverty rate, amounting in fact to between 8 and 16%. These regions meet the corresponding EU 2020 target regarding. Only the national rate for the UK shows slightly higher results.
- The share of people with higher educational achievements in the North Sea Region is average compared to the rest of Europe. Zooming in on young academics (aged 30-34 years), it becomes apparent that many regions have already met the Europe 2020 target, i.e. 40% of regional population aged 30-34 with tertiary education attainment, and many are close to achieving the target.
- An important factor for avoiding high shares of at-risk-of-poverty or social exclusion is a decreasing share of early school leavers. Mainly in Norwegian and northern Scottish regions 20% of population aged between 18-24 years does not have a degree. This indicator is highly dominated by the national level so that transnational measures will only have impacts if stakeholders from the national level take part and the educational and training systems as well as the labour markets are reformed and restructured.

A last focus on cooperation proposes some indicators as a proxy of institutional capacity in the cooperation activities/projects. As in Europe, there are huge disparities in cooperation degree in the North Sea Region programme area. Peripheral regions stand out and this is particularly the case of Swedish, Norwegian and Scottish regions. While some regions in Germany and in the Netherlands managed to take advantage of cooperation opportunities e.g. Hamburg and Zeeland, most of the remaining Programme area regions did not i.e. most UK, Belgium, Dutch and German regions. A large majority of regions in the North Sea Region programme areas has a medium range and intensity of territorial cooperation. This is in line with the rest of Europe's core regions. Some cities even are qualified "Hubs of territorial cooperation" e.g. Hamburg.

The discussion with the programme illustrated that the ESPON results on inclusive growth can be useful for the needs analysis and thematic concentration of the future programme. Moreover, the indicators on lifelong learning and people with high education may

be useful for identifying promising projects and for stakeholder dialogues. Concerning the indicator on risk of poverty, it is available at NUTS0 level for United Kingdom, Norway and Belgium; it would be desirable if it was more specific and detailed regarding the territorial scale due to a considerable difference across regions. Indicator on participation of adults in education and training is considered suitable for identifying promising projects, while 'people with high education' and 'young academics' is appraised adequate to be included into dialogues with other stakeholders of the North Sea Region.

ESPON indicators used by TerrEvi. The table below indicates possible links between the indicators of the ESPON maps on smart, sustainable and inclusive growth presented in this factsheet and the thematic objectives for the next funding period 2014-2020. Linking future thematic objectives and the indicators used by TerrEvi shows that ESPON produces evidence that can be used and support a territorially differentiated development and management of territorial cooperation programmes. In other words, ESPON results can support work linked to achieving territorial cohesion and the implementation of the Europe 2020 strategy.

<div> <div> 2014-2020 Thematic Objectives </div> <div> ESPON indicators used by TerrEvi </div> </div>	Share of R&D infrastructure	Private sector R&D expenditures	Research specialisation	Employment in Knowledge-Intensive services	Human resources in science and technology	Territorial patterns of innovation	Private use of e-commerce	ICT employment	Wind power potential	Wave power potential	Maritime flows	Combined adaptive capacity to climate change	Potential impact of climate change	Potential vulnerability to climate change	GHG emissions	Employment rate	Long-term unemployment rate	Change in population in 2005-2050	Share of old people	People at risk of poverty	People with high education	Young academics	Adults in education and training	Regional early school leavers	Multimodal potential accessibility	Impact of Directive on promotion of use of biofuels	Cooperation degree	Typology of territorial cooperation
Strengthening research, technological development and innovation	X	X	X		X	X		X		X											X	X	X				X	
Enhancing access to and use and quality of ICT				X	X		X	X																				
Enhancing the competitiveness of SMEs	X	X				X																						
Supporting the shift towards a low-carbon economy in all sectors									X	X					X													
Promoting climate change adaptation, risk prevention and management												X	X	X														
Protecting the environment and promoting resource efficiency									X	X	X	X	X	X												X		
Promoting sustainable transport and removing bottlenecks in key network infrastructures											X													X				
Promoting employment and supporting labour mobility				X	X			X								X	X				X	X	X					
Promoting social inclusion and combating poverty																		X	X	X	X	X	X					
Investing in education, skills and lifelong learning by developing education and training infrastructure																					X	X	X	X				
Enhancing institutional capacity							X																				X	X

Introduction

ESPON supports policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory. It provides comparable information, evidence, analysis, and scenarios on territorial dynamics, which reveal territorial capital and development potentials of regions and larger territories. Considering the programme area in its European context adds an important new perspective that can help shaping the programming and the places of implementing projects. The ESPON TerrEvi project focuses on producing evidence for Structural Funds programmes with the aim to support the development of the programmes to be carried out in the 2014-2020 period.

In order to support evidence based planning cartographic visualizations serve as an important medium of communication besides the usage of a common language, diagrams, plans or pictures in this document. Maps can attract attention to specific facts and circumstances with spatial impact since information is communicated and procedures are facilitated. In the ESPON Programme the majority of maps contain thematic representation of regional disparities based on indicators, comprised indicators or typologies. They display the actual state of affairs and therefore serve as a basis for comparison, contextualisation and joint action. In this sense, maps reinforce discussing the reality and performing policy action graphically and in a normative way.

One milestone of this work consisted in presenting selected ESPON research pieces in easy-to-understand factsheets for all territorial cooperation programme areas. The aim is to provide the reader with preliminary insight on types of territorial evidence ESPON holds at hand with regard to the possible thematic objectives of future programmes.

([Link to factsheets on ESPON website](#)).

The second milestone concerns ten specific programme case studies illustrating how ESPON material can be used to support the development of future programmes e.g. by giving a comparative European dimension to the envisaged programme work. The aim is to provide the reader with insight on different types of territorial evidence ESPON holds at hand with regard to the possible thematic

objectives of future programmes, and to stimulate a debate on how this evidence can be used by future programmes.

Criteria like the coverage of all regional categories (less developed, transition, more developed regions), the variance of available budgets, the mix between old and new, small and large, central and peripheral Member States or the expression of willingness to cooperate with TerrEvi built the basis for a shortlist of 20 regions for the final selection of case studies by ESPON in an early stage of the project.

The TerrEvi team started to contact these preliminary selected programmes introducing the project and evaluating the possibility being one of the ten pilot cases. As a matter of fact and due to different reasons the final list of pilot cases consists of four regional programmes, one CBC programme and five TNC programmes:

- Molise (regional)
- Umbria (regional)
- Thessalia (regional)
- Norte (regional)
- Slovakia – Austria (CBC)
- North West Europe (TNC)
- North Sea (TNC)
- Alpine Space (TNC)
- Atlantic Area (TNC)
- South East Europe (TNC)

The list of pilot cases has been set up in coordination with the ESPON programme and has been approved by the ESPON Coordination Unit.¹

The present report is one of ten evidence reports which have been produced to build the basis for the work of the case studies. A draft version of the document served as basis for a workshop with the programme in the first quarter of 2013. The workshop highlighted

¹ The detailed selection procedure is part of the Interim Report of the TerrEvi project from December 2012.

the potential use of ESPON material for territorial cooperation programmes.

Following the workshop, this document has been amended taking into account the discussions as well as considerations concerning the usefulness of single indicators in various steps of the programme work.

North Sea programme is free to use the material for their development and implementation of the programme for 2014-2020.

Methodology

For this evidence report the TerrEvi project team conducted a workshop with the relevant stakeholders in charge for programming. In the following the workshop methodology is explained enabling readers of this paper to understand how the information has been collected.

Furthermore a User's Guide for the traffic lights in the Europe 2020 chapter of the evidence report is part of this methodology section.

Workshops

The work on the Evidence Reports was organised in three main steps.

Step 1 – Preparation Phase

After the preliminary contacts made in summer 2012, the team contacted the Programme Authority, (by email) illustrating:

- the ESPON TerrEvi project and the organisation of the team;
- the reason why the area has been appointed to be a pilot case for ESPON 'Territorial Evidence Packs';
- the main steps of the case study activity.

Once the contacts have been established and the framework of the case study fixed, the project team prepares the set for the case study. More specifically the project team:

- sent the Factsheet to the authorities;
- presented a more detailed timetable and some draft contents for the workshop;
- discussed the process of the case study with the participants;
- started the organisation of the workshop.

Step 2 - Draft Evidence report, workshop and final Evidence report

Following the preliminary phase, the Draft Evidence Report was delivered to the programme authority. It entailed several indicators and highlighted territorial trends with a European perspective. All

thematic objectives were covered and there has been a table to match our selected indicators with the thematic objectives. The Draft Evidence Report has been sent to the workshop participants for diffusion.

The participants consisted in general of persons in charge for the programming (MA, JTS, external experts). The TerrEvi team addressed in the workshop five relevant programming stages:

- Needs Analysis
- Thematic Concentration
- Result Indicators
- Project Selection
- Stakeholder consultation

Following these stages as a basis the workshop had the structure below:

- Introduction (presenting the set of indicators)
- Relevance of indicators
 - The participants discussed together with the TerrEvi team how relevant/important the presented indicators are at which programming stage. This procedure was done three times, for the indicators in Smart, Sustainable and Inclusive growth separately.
- Discussion about issues of particular interest for the programme.
- Conclusion of the workshop covering the issues:
 - Where does your programme have use of ESPON? (to strengthen the territorial dimension / make your life easier)
 - What could ESPON do to be useful in future? (incl. relevance and availability of information)
 - Territorial dimension & structures (programme area in Europe, diversity within the programme area).

The results were collected by the TerrEvi team and fed into the draft evidence report (Results and feedback from the workshop).

Step 3 – Feedback

Every programme received a draft version of the final evidence report comprising the workshop results in order to verify if the contents of the ESPON Evidence Report have been used comparing with the expectations collected in the workshop.

Traffic lights for the programme area indicators: User's Guide

The traffic lights at the beginning of the chapter 'Europe 2020' were created in order to graphically represent the situation of each analysed TNC² Area compared to the ones of EU27+4 space, to the rest of TNC programme areas, and finally to each country participating to the TNC Area.

The median value, calculated depending on the values registered for every NUTS 2/NUTS 3 region composing the programme area was used as the central value indicator. The median of the programme area was compared successively to the ones computed for EU-27+4 territories, for the rest of the TNC areas and, ultimately, with those for the countries involved in the TNC Area.

Interval thresholds were obtained by calculating the arithmetic mean between the median and the values of the first (Q1) and third (Q3) quartiles. These calculations defined the lower (L1) and upper limits (L2) of each interval.

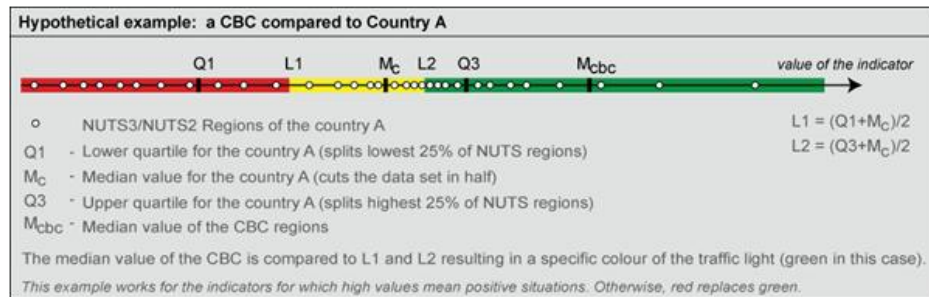
Therefore, we have three distinctive situations:

1. When the median value of the co-operation area is below L1, there will be a red traffic light indicating problems inside the TNC Programme Area (or green traffic light if there is a noticeable progress: i.e. long-term unemployment).

² This User's Guide was developed for the CBC area factsheets. The methodology also for TNC or regional programmes compared to the relevant national level(s) remains the same.

2. When the median value of the co-operation area is between the lower and the upper thresholds, there will be a yellow traffic light marking a similar situation of the TNC Area to the rest of the spatial structures.

3. When the median value of the co-operation area is over L2, a green traffic light will be displayed (or red traffic light when there is a negative trend: i.e. potential vulnerability to climate change).



Choosing median as central value requires a special attention in analysing the traffic lights when the number of NUTS 2/NUTS 3 regions is below 7. Using percentiles implies also that the final result is highly dependent on the type of statistical distribution. This should be considered as well when establishing the relative situation of a TNC Area compared to a specific country.

Context information

The main focus of this report is on a discussion how the North Sea Region stands with relation to the three objectives of Europe 2020 (smart, sustainable and inclusive growth), the thematic objectives and the thematic objectives of future Structural Funds. This discussion may help the programme to see comparative advantage of the programme area which possible could be further strengthened with help of the next North Sea Region programme. Alternatively, one might also be able to detect comparative disadvantage (as compared to the rest of Europe) which the future programme might help to reduce.

However, before entering this debate, the focus will be on two important context indicators. These are population change and GDP per capita.

Demographic change and economic performance are important aspects which also will be discussed in relation to a series of other indicators throughout the report. Consequently, the first two maps are mainly meant to set the scene and provide a general understanding of the situation.

Population change

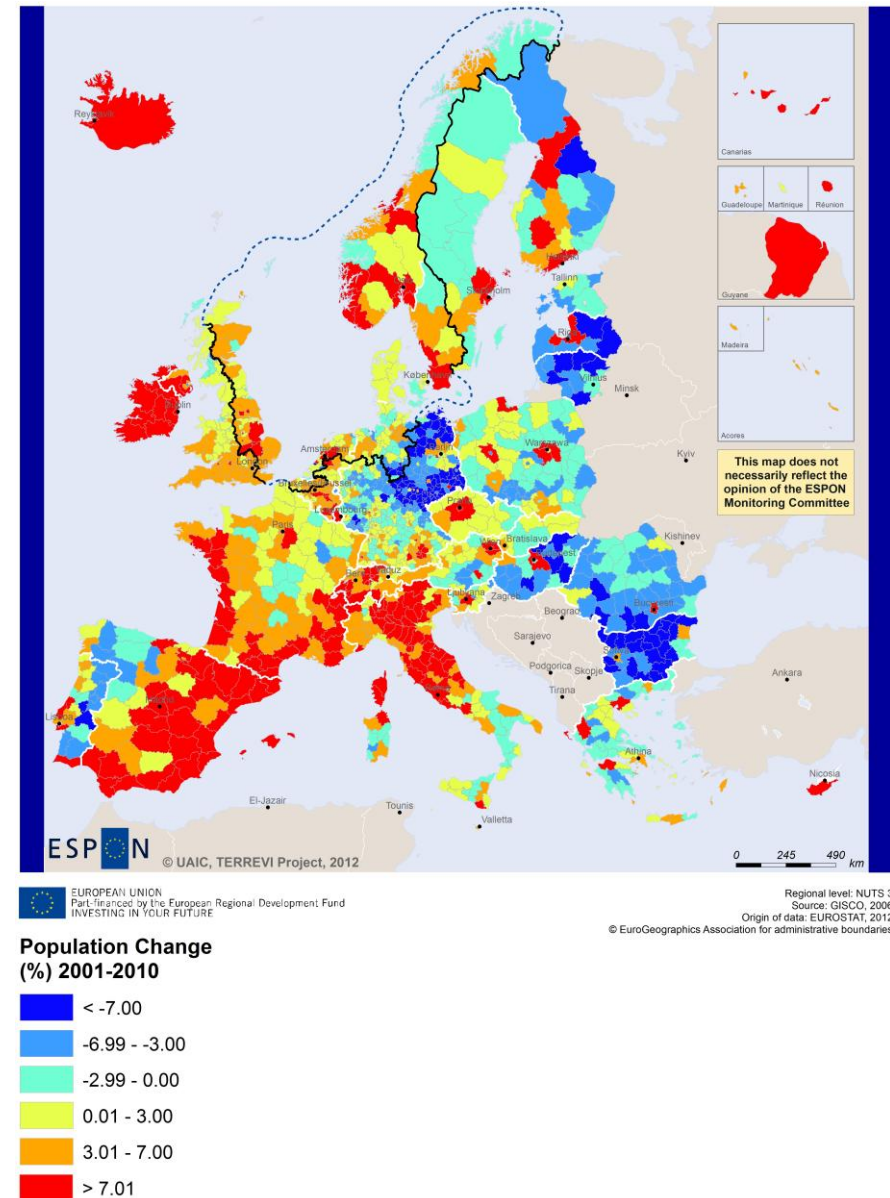
Population change is the difference in the size of a population in a given time period. The change has two components: natural population change, i.e. number of live births minus number of deaths, and net migration, i.e. number of immigrants minus number of emigrants. The map covers the period 2001 to 2010.

It is striking that areas of population growth and those of significant population decrease are often close to each other. At European level, population is particularly growing in a Mediterranean arc ranging from central Italy over southern France to eastern and southern Spain, and in an Atlantic Arc ranging from western France to Ireland and Iceland. In addition, population grows in some regions of Nordic countries and in all capital regions. Significant population decrease can be found in north-western Spain, several Portuguese regions, eastern and central Germany, the Baltic states, some peripheral regions of Finland and south-eastern Europe – except their capital regions.

Within the North Sea Region one can notice the presence of an attractive zone inside the countries affected by a demographical decrease, i.e. Skåne in Sweden, region centred on Malmö, with a growth of almost 4% and Flevoland in the Netherlands with similar values. United Kingdom regions have mainly positive values for various reasons e.g. international labour force migration, the closeness of urban conglomerates as Sheffield-Leeds in the region of North Yorkshire. Scottish Highlands are reporting a big demographical reanimation process, due to internal and international migration (4-6% demographical growth, the biggest values being in Inverness-Nairn). Continental Europe shows a differentiated pattern. In Danish and Dutch regions, there are rather positive dynamics, while German regions have a negative demographic balance.

The map shows population change until 2010. One has to take into consideration that the economic crisis, which has partly influenced and changed migration patterns since then.

This map was originally prepared for the ESPON DEMIFER project and reproduced for TerrEvi project.



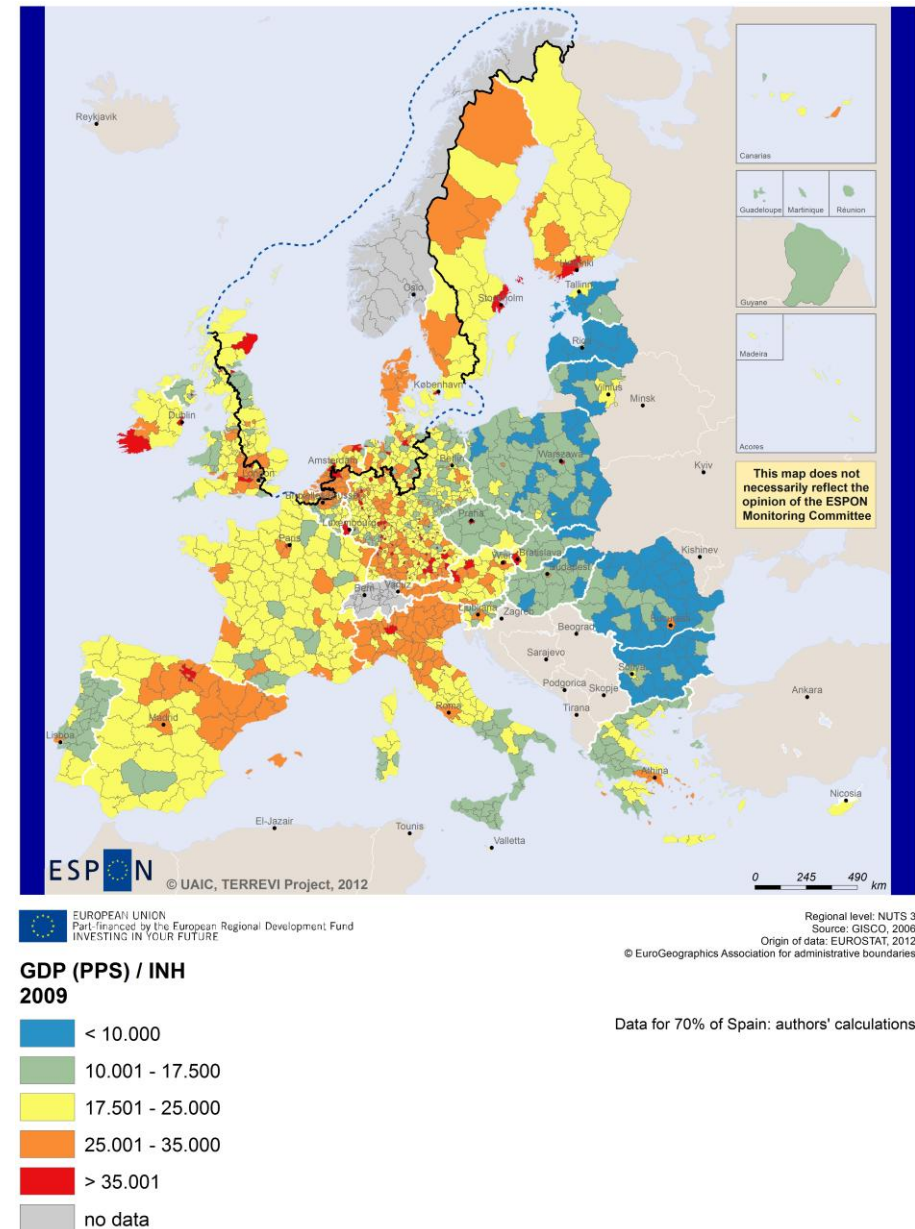
Map 1 Population change, 2001-2010

GDP in PPS per capita

GDP in PPS (Purchasing Power Standard) per capita is an important indicator for the level of economic competitiveness. At EU level, the territorial distribution of GDP respects the principle of spatial autocorrelation, few deviations from the rule being generated either by the presence of competitive urban centres or by the border effect. The map regards 2009.

The most significant difference in GDP per capita appears between former EU15 states and the Member States which became part of the EU 2004 and 2007. But there are also regions with comparably low GDP in EU15, for example in Greece, Southern Italy, Portugal or the UK. Additionally, the map shows that in many states wealthy regions are far from their capital regions (Munich, Salzburg, Álava, Milano) and that even areas of the European periphery are among economic strong regions (northern and central Sweden, Aberdeen, south-western Ireland for example).

The North Sea region encompasses mainly well performing NUTS3 regions in terms of economic development. Nordic countries (Norway, Sweden, Denmark) and the Netherlands generally have higher values compared to the European average. North-eastern England is a periphery both in national and transnational context. British and German infranational disparities are high. Furthermore, it is to notice that wealth is mainly concentrated in cities e.g. Randstad in Holland, Edinburgh and Aberdeen in Scotland.



Map 2 GDP (PPS), 2009

1 Europe 2020

Europe, with its member states and their regions, is more exposed to global shocks and international competition than at any time before. As the world becomes more interdependent this trend will continue and shape policy thinking across sectors, borders and geographical scales. At the same time, Europe is characterised by a large territorial diversity meaning that global developments can imply rather different development possibilities and challenges for different European regions and cities.

The differences are partly defined by major geographical structures such as urban systems, access and connectivity, the geographical specificity or population density. At the same time, the differences are also spelled out in the larger development trends that affect an area and the way and degree to which it is affected.

The data, indicators and territorial evidence provided by ESPON provide insight on both the main structures and larger territorial trends. The fine art is to identify what can actually be influenced by policy-making and, in particular, by place-based policy and territorial cooperation related to your programme area.

This chapter provides a selection of ESPON data related to Europe 2020 objectives of smart, sustainable and inclusive growth, giving also hints as regards the main thematic objectives envisaged in the draft regulations for the next period of EU Cohesion Policy. The Europe 2020 Strategy aims to enhance smart, sustainable and inclusive growth. This strategy has clear territorial dimensions. However, achieving these goals is challenging in the crisis-driven times. Furthermore, the economic disparities are growing as economic trends and the crisis have various impacts on different parts of Europe.

In the following the traffic lights for selected indicators represent how your programme territory compares to wider European medians where green = your programme area performs better for that indicator, yellow = similar, and red = worse.

The traffic lights were created in order to graphically represent the situation of the programme area compared to the one of the EU-27+4 space. The median value, calculated depending on the values

registered for every NUTS 2/NUTS 3 region composing the programme area was used as the central value indicator. The median of the programme area was compared to the one computed for EU-27+4 territory.

EU 27+4 in traffic lights means the EU Member States as well as Iceland, Liechtenstein, Norway and Switzerland – the ESPON space.

Smart growth refers to developing an economy based on knowledge and innovation. In the framework of the Europe 2020 Strategy it means improving the EU's performance in education, research/innovation and digital society.

Sustainable growth refers to promoting a more resource efficient, greener and more competitive economy. Within the Europe 2020 Strategy it means e.g. building a more competitive low-carbon economy that makes efficient, sustainable use of resources, protecting the environment, reducing emissions and preventing biodiversity loss, capitalising on Europe's leadership in developing new green technologies and production methods, and introducing efficient smart electricity grids. In the framework of the Europe 2020 Strategy it means focus on competitiveness, resource efficiency, climate change and biodiversity.

Inclusive growth refers to fostering a high-employment economy delivering social and territorial cohesion. Within the Europe 2020 Strategy it means raising Europe's employment rate, helping people of all ages anticipate and manage change through investment in skills & training, modernising labour markets and welfare systems, and ensuring the benefits of growth reach all parts of the EU. In short the key factors are employment and avoiding risk of poverty and social exclusion.

Smart growth. The indicators used for smart growth show one yellow and two green traffic lights for the North Sea Region TNC. The TNC has higher values compared to the EU27+4 area with regards to employment in knowledge-intensive services, and the number of persons regularly using the internet. With regards to R&D expenditure, the TNC area has similar values compared to the EU27+4 space although it must be added that the disparities within the area are high.

Sustainable growth. The North Sea Region's values for the sustainable growth indicators 'wind energy potential' and 'potential vulnerability to climate change' are similar to the EU27+4 area. In contrast, the traffic light system shows that the North Sea Region is less concerned by ozone concentration than the EU27+4 area. However, for all indicators, disparities within the TNC are high.

Inclusive growth. With regards to inclusive growth, the North Sea Region has a similar at-risk-of-poverty and persons aged 25-64 and 20-24 with upper secondary or tertiary education attainment rates than the EU27+4 area. With regards to the long-term-unemployment rate in the programme area is lower to the EU27+4 level; however, there are quite high disparities within the area.

In the following sections more detailed indicators related to smart, sustainable and inclusive growth will be discussed. The related maps will help to get a more nuanced picture on how the North Sea Region stands as compared to the rest of Europe and also show the territorial diversity of the North Sea Region.

1.1 Smart Growth

Smart growth is a key component of the Europe 2020 Strategy. During the past years it has evolved into an objective for many European sector policies as well as for a wide range of national policies all over Europe. Structural Funds Programmes are expected to make a sizable contribution to smart growth.

Broadly smart growth means improving Europe's economic performance by focusing on research and innovation, the digital society and the competitiveness of SMEs and a range of different sectors. The focus is on creating new and better products and service – not at least by diffusing information and communication technologies – that generate economic growth and jobs. So, it is tightly linked to performance in the education field and the concept of green growth, i.e. the aim to shift the pattern of economic growth towards an environmentally-friendly one.

The contribution which any city or region can make to these aims depends on a wide range of territorially varying preconditions. This territorial diversity is an important asset to achieving smart growth. At the same time, work towards smart growth will have territorial impacts, which lay the ground for changing development opportunities in different types of territories. This section discusses some of territorial variations that shape the pre-conditions to contribute to smart growth, and their effects.

Smart growth is tightly linked to the economic performance of private enterprises in a globalised world. Some years ago, globalisation was seen as the end of geography. Today it is clear that there are simultaneous processes of regionalisation and globalisation. Distance and agglomeration economies have become even more central through increasing financial, trade, human and knowledge flows. This results in two decisive functional scales for globalisation: city and macro-region.

In addition to the indicators and maps displayed in the following, there are also other ESPON maps which can be of interest. There is e.g. a map on broadband penetration, which has not been taken into this report as it is based on data from 2006 to 2009.

	Total Intramural R&D Expenditure (GERD). Percentage of the GDP (2009)			Employment in knowledge-intensive services as percentage of total employment (2010)			Percentage of individuals regularly using internet (2011)		
	disparities in the TNC Area	median value of the TNC Area	median value of EU-27+4	disparities in the TNC Area	median value of the TNC Area	median value of EU-27+4	disparities in the TNC Area	median value of the TNC Area	median value of EU-27+4
SMART GROWTH	high	1.6	1.2	low	45.0	39.0	low	81.5	71.0
	Wind energy potential			Ozone concentration			Potential vulnerability to climate change		
SUSTAINABLE GROWTH	high	86599	73939	high	5.7	8.6	high	0.1	0.1
	Long-term unemployment rate (12 months and more) - 2011			At-risk-of-poverty rate - 2011			Persons aged 25-64 and 20-24 with upper secondary or tertiary education attainment (%) - 2011		
INCLUSIVE GROWTH	high	2.1	3.0	high	15.4	15.7	low	75.4	76.4

Regional level of analysis: NUTS 2 (except for Potential vulnerability to climate change - NUTS 3)
Thresholds for detecting disparities using the variation coefficient: low ≤ 15%, medium 15 - 30%, high ≥ 30%
Origin of data: EUROSTAT 2012, ESPON ReRisk, ESPON INTERCO & ESPON Climate Projects

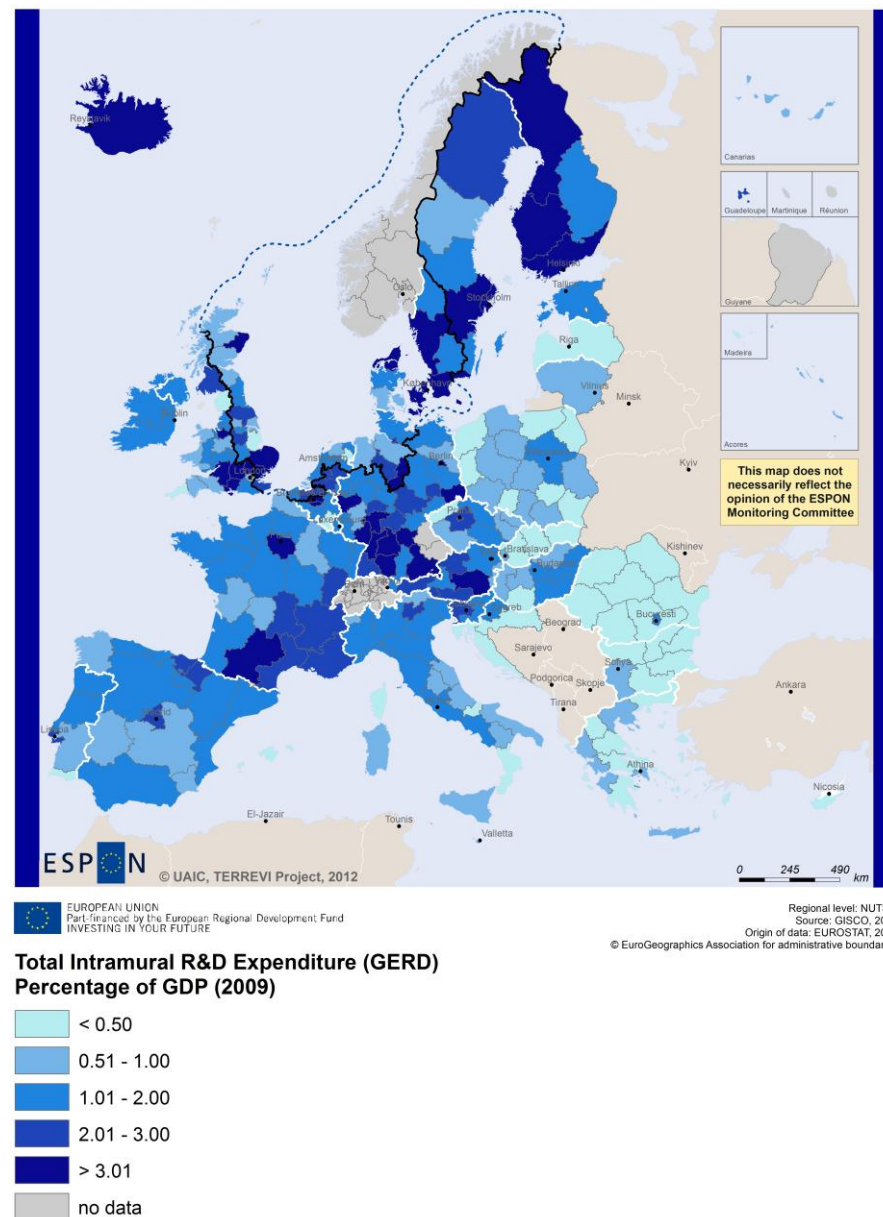
Total intramural R&D expenditure

The total gross domestic expenditure on research and development comprises: business enterprise expenditure on R&D, higher education expenditure on R&D, government expenditure on R&D and private non-profit sector expenditure on R&D. The indicator measures the key R&D investments that support future competitiveness and result in higher GDP. R&D expenditure represents one of the major drivers of economic growth in a knowledge-based economy. Investing 3% of GDP is therefore one of the headline targets in the new Europe 2020 strategy for developing an economy based on knowledge and innovation (EUROSTAT 2010).

The shares of R&D expenditure on GDP seem to generally differ within Europe. A higher share affects the Nordic countries (especially Finland) and the 'pentagon' area (London-Hamburg-Munich-Milano-Paris). No Southern or South-Eastern (EU12) European region spends more than 3% of GDP for R&D. Especially Bulgaria and Romania are shaped by R&D expenditure rates below 0.50%. The share generally decreases from northern to southern regions. Still, sub-national differences predominantly occur, depending on local and regional specializations, governance, public or private participation to R&D etc. In southern France and southern UK for example, the share in neighbouring regions varies from 0.51 to more than 3%.

In a European perspective, the North Sea Region shows a differentiated territorial pattern with low and medium to higher average levels of R&D expenditure (seen as percentage of GDP). Single regions in north-eastern UK, northern Netherlands, Germany and southern Denmark verge on falling behind (< 1%) while the share of R&D expenditure encompasses more than 3% of regional GDP in certain areas of southern UK and Sweden and in Denmark.

This map was originally prepared for the ESPON KIT project and reproduced for TerrEvi project.



Map 3 Share of R&D expenditure of GDP, 2009

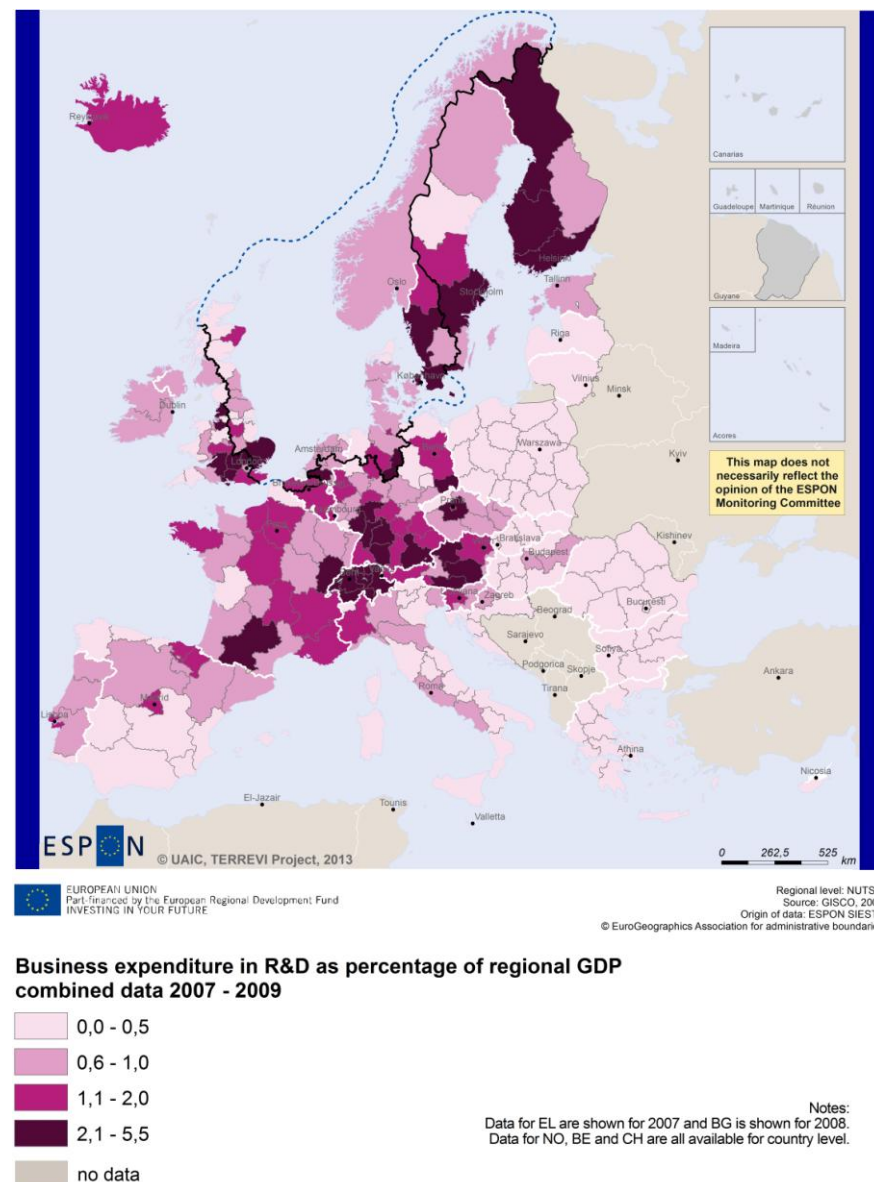
Private sector R&D expenditures

Within the overall EU2020 Strategy, the contribution of the private sector to R&D expenditures is important. Private sector investment is considered central to enhancing economic productivity and growth. Therefore, flagship actions focus on creating favourable conditions for private sector investments like measures on access to finance, risk-sharing, the provision of venture capital, cross-border matching of innovative firms with investors, a review of regulatory frameworks and the development of a European knowledge market for patents and licensing.

Three corridors with comparatively high shares stand out: From southern France to southern Germany, from Copenhagen to Finland and from south-east England to Austria. In addition, an east-west divide occurs. Except Prague and Ljubljana no region of the new member states indicates shares of > 1%. As for total R&D expenditure, sub-national disparities become apparent especially between urban centres and their rural surrounding, for example in Aberdeen, Berlin or Madrid.

Just a few regions from the UK, western Germany and northern Denmark indicate shares below 0.5%. Most regions have shares of 0.5-1%, some like Edinburgh, Flanders or Hamburg 1-2%. Single regions like in south eastern England, Västsverige, Sydsverige in Sweden, Hovedstaden in Denmark and Noord-Brabant in the Netherlands even show shares of > 2%. The overall pattern is quite similar to the pattern for total R&D expenditures. This even facilitates the risk for regions with lower and lowest shares that already verge on falling behind as public R&D investments do not seem to be capable of balancing maladjustments of business expenditures on R&D.

This map was produced for the ESPON SIESTA project.



Map 4 Business expenditure on R&D as percentage of regional GDP, combined years from 2007 to 2009

Employment in Knowledge-Intensive Services

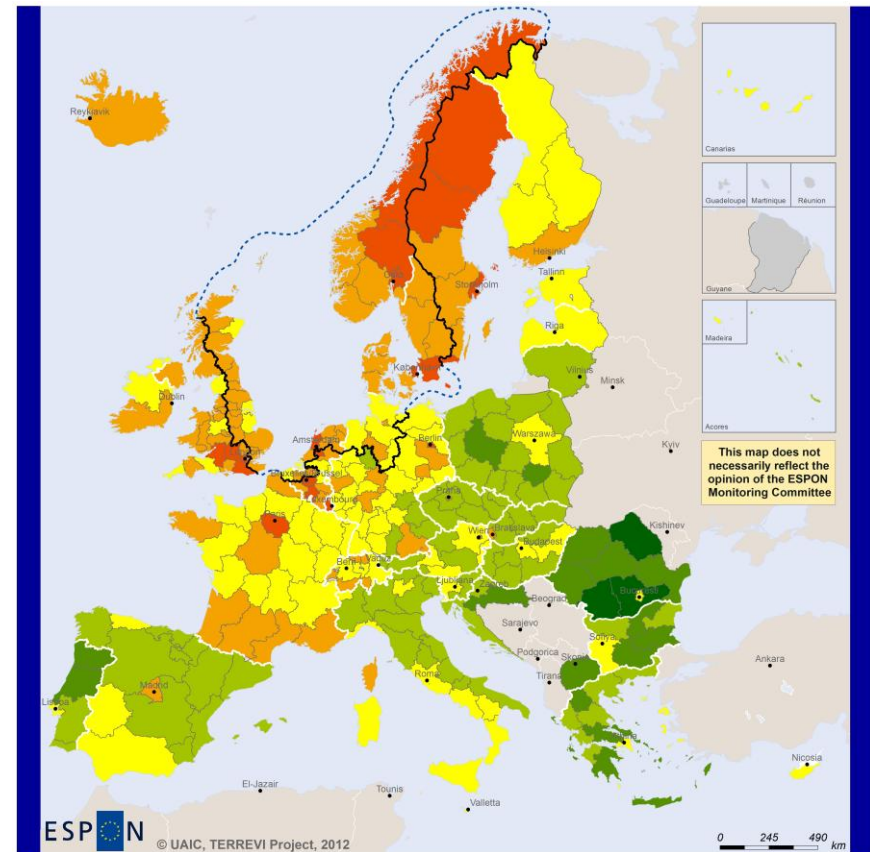
Knowledge-intensive services comprise a broad set of very different activities. Innovation processes, structures, and performance differ notably among these services. According to EUROSTAT, they include:

- (1) knowledge-intensive high-tech services: post and telecommunications; computer and related activities; R&D;
- (2) knowledge-intensive market services (excluding financial intermediation and high-tech services): water transport; Air transport; real estate activities; renting of machinery and equipment without operator, and of personal and household goods;
- (3) knowledge-intensive financial services: financial intermediation, except insurance and pension funding; insurance and pension funding, except compulsory social security; Activities auxiliary to financial intermediation;
- (4) other KIS: education; health and social work; recreational, cultural and sporting activities.

A North-South gradient can be observed for the territorial variation in the share of employment in Knowledge-Intensive Services. Northern regions (Ireland, the UK, France, as well as the Nordic countries and Germany) are better endowed for this type of human capital, while Southern and Eastern Europe (which includes Spain (except Madrid region) and Portugal) have shares below the EU average. Capital regions do in general have a higher share of KIS than the surrounding regions. Still, infra-national differences occur, as a result of local combinations of factors.

Regarding the North Sea Region, this TNC area concentrates important shares of knowledge employment at the European level. Most regions are above the EU average mean. Better endowed in human capital for this indicator are Belgium, Netherlands and Sweden, the highest values being observed in the regions of Copenhagen (58.93%), Amsterdam and Sydsverige. The impact of these regional differences must be interpreted in relation with local specialisations, R&D investments, presence of major research centres and specific regional innovation systems.

This map was originally prepared for the ESPON KIT project and reproduced for TerrEvi project.

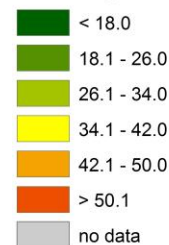


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Regional level: NUTS 2
Source: GISCO, 2006
Origin of data: EUROSTAT, 2012
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Employment in Knowledge-Intensive Services as Percentage of Total Employment (2010)



Map 5 Employment in Knowledge-Intensive Services, 2010

Human resources in science and technology

Human resources in science and technology (HRST) are defined, according to EUROSTAT, as persons fulfilling at least one of the following two conditions:

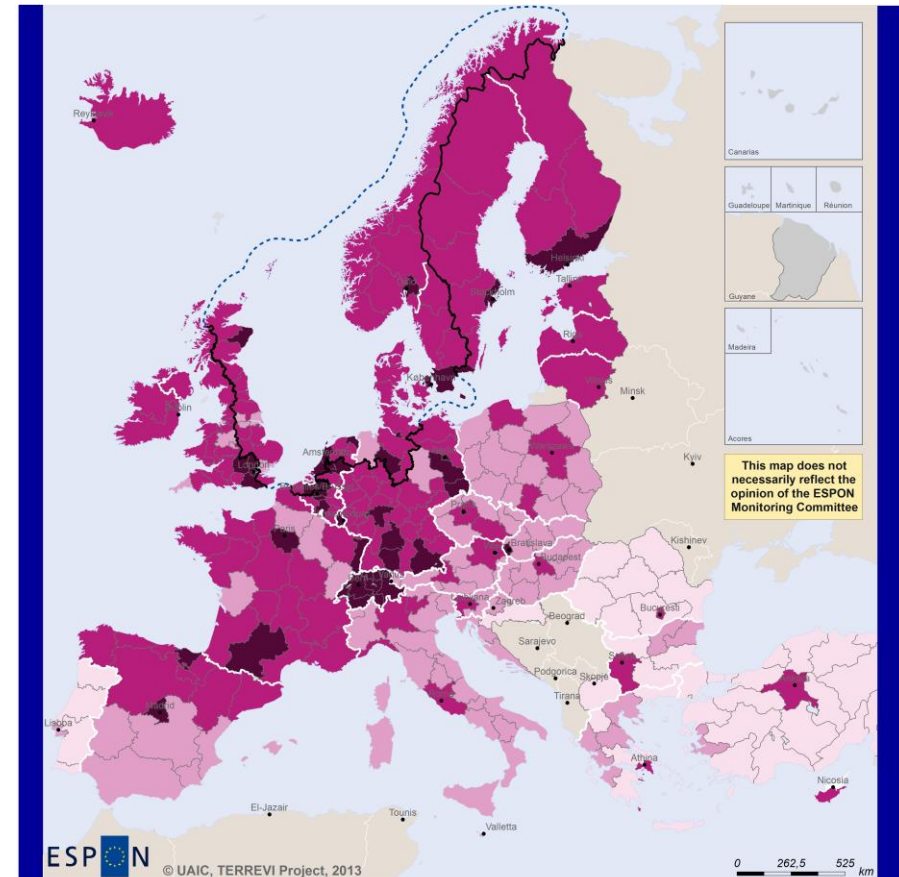
- (1) human resources in terms of education: individuals who have successfully completed a university level education;
- (2) human resources in terms of occupation: individuals who are employed in a science and technology occupation as 'Professionals' or 'Technicians and associate professionals'.

The group that fulfils both of these criteria is called the 'HRST core'.

There is a concentration of scientists and technologists in Northwest Europe as well as in the Nordic and in the Baltic countries. Most capital cities employ > 35% of human resources in science and technology. On the other side, large parts of Eastern and Southern Europe (except northern Spain and most capital regions), indicate shares < 35%. Most regions in Romania, Bulgaria, Turkey and Portugal even show shares < 25%.

Most regions of the North Sea Region show shares between 35 and 45%.

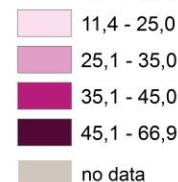
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Human resources in science and technology as percentage of active population, 2010



**Map 6 Human resources in science and technology as
percentage of regional active population, 2010**

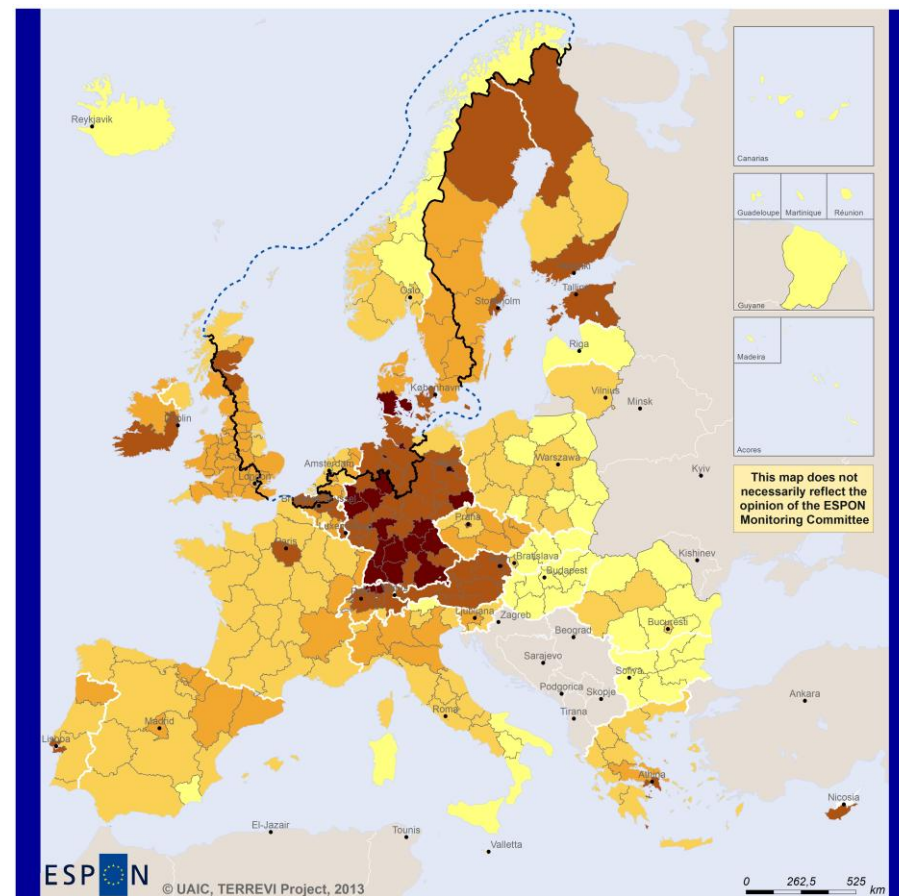
Territorial Patterns of Innovation

Territorial patterns of innovation are made of a combination of territorial specificities (context conditions) that are behind different modes of performing the different phases of the innovation process³. Main conditions concern science-based knowledge, R&D endowment, human capital, receptivity to interpret and use external knowledge and creativity. 'European science-based areas' are most knowledge and innovation intensive but seem to be less attractive and creative. While 'Applied science areas' have the chance to specialise themselves in the production of applied knowledge, 'Smart technological application areas' focus on product innovation. Innovation capacity in 'Smart and creative diversification areas' is fed by external knowledge which is embedded in technical and organisational capabilities. 'Imitative innovation areas' can build on local preconditions like creativity and especially attractiveness in order to embrace new adoption, imitation and innovation strategies.

Significant regional differences can be observed. The '*European science-based*' cluster includes most knowledge and innovation intensive regions, e.g. Syddanmark. '*Applied science*' cluster contains strong knowledge producing regions, with a diversified knowledge production profile, mainly located in Northern Germany, Northern Belgium and in Eastern Scotland. The main opportunities for the territorial patterns of innovation are associated with the specialization of the production of applied knowledge using the basic knowledge from the science based area. '*Smart technological application*' regions have high knowledge base with a lower innovation profile e.g. eastern UK, Netherlands, south east Sweden and Northern Denmark. '*Smart and creative diversification*' cluster covers low knowledge potential, capabilities regions, located in UK (Northern Ireland, Highlands and Islands, Lincolnshire, East Yorkshire and Northern Lincolnshire) and in central and northern Netherlands.

This map was produced for the ESPON KIT project.

³ For the list and the methodology for the identification of territorial patterns of innovation, see chapter 2 in Vol. 1 of the Scientific Report of the ESPON KIT project.



Territorial Patterns of Innovation

- Creative imitation area
- Smart and creative diversification area
- Smart technological application area
- Applied science area
- European science-based area
- no data

Map 7 Territorial Patterns of Innovation, 2011

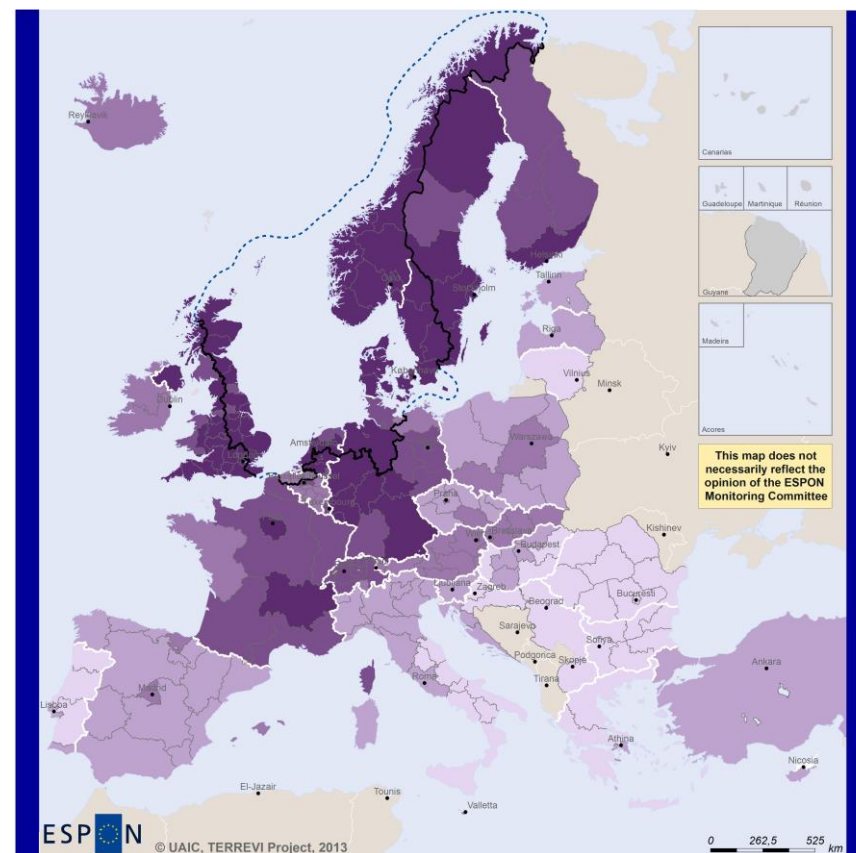
Private use of e-commerce

E-commerce is closely related to the uneven access of households and enterprises to internet facilities. This links e-commerce with the so-called digital divide. The map shows the share of individuals (aged 16 to 74 years) who ordered goods or services over the internet for private use. In doing so, the map also shows whether the internet is being used for commercial purposes, i.e. how it is effectively penetrating in businesses across Europe. The map shows information for 2010.

As the maps shows, the use of e-commerce differs mainly between countries and only to a limited degree between regions within a country. Overall, there is quite a clear divide between East and West and between North and South, with the North-West of Europe being more advanced. In the UK, Norway, Sweden, Germany or other countries where the internet is widely accepted and used, only limited regional variations can be observed. At the same time, e-commerce exploitation is low across the regions of the Mediterranean countries, Portugal and large parts of Eastern Europe. In these countries, even in capital cities and large metropolitan regions, e-commerce is not widely utilised.

In a European perspective, the North Sea Region is characterised by relatively high levels of e-commerce usage. In comparison to other countries of the TNC area, UK and western Germany show the highest shares of private use of e-commerce. Furthermore, Belgium seems to be affected by a national dimension, as no Belgian region indicates a value of > 30%.

This map was produced for the ESPON SIESTA project.



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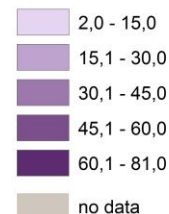
Regional level: NUTS 2, NUTS 1 & NUTS 0

Source: GISCO, 2006

Origin of data: ESPON SIESTA

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E-commerce or individuals (aged 16 to 74) who ordered goods or services over the Internet for private use as a percentage, 2010



Notes (according to ESPON SIESTA):
DE, FR, EL, RS and PL are shown at NUTS1 level.
TR is shown at country level and data for this country were provided by Turkstat.
Data for CH was provided by Swiss Statistics web site.
Data for BH11, BG12, BG13, BG21, BG22, BG23, and FI2 are not available for 2010, the regions are shown for 2010.
TR data corresponds to 2011.
UKE1 data are not available for 2010 and are shown for 2009.

Map 8 Private use of e-commerce, 2010

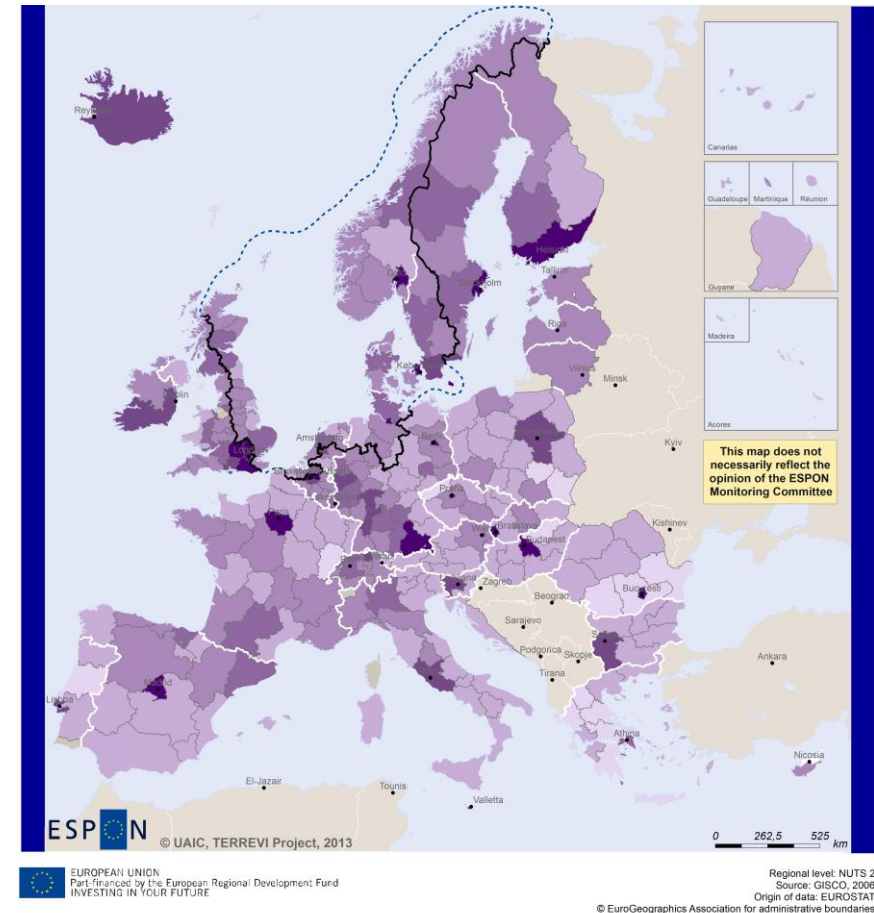
ICT employment

The Information and Communication Technologies (ICT) sector accounts for a substantial part of European GDP, employment and R&D expenditures. It is a highly R&D intensive sector. As general purpose technologies, ICT goods and services are important drivers of productivity growth and economic performance across all sectors.

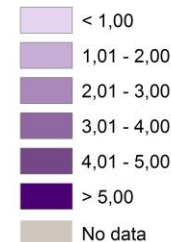
The distribution of ICT employment is highly uneven across Europe. In general, capital regions stand out as those regions showing highest values, i.e. > 5%. On the other hand, rural areas and mainly those in Eastern and Southern Europe tend to lag behind. Therefore, a general rural-urban divide is evident. Regions with shares of < 1% are concentrated in Portugal, Turkey, Greece and Romania. These regions verge of falling behind and constitute an important territorial challenge which requires initiatives promoting ICT technologies and focussing on peripheral areas.

The North Sea Region is also affected by a rural-urban divide. In a few areas like Scotland and Wesser-Hems between 1 and 2% of employed persons works in the ICT sector. Urban areas like Amsterdam, Copenhagen, Lisbon or Oslo show higher shares up to 5%.

This map was produced for the ESPON SIESTA & M4D projects.



Share of employed persons in the information and communication sector, 2012



Map 9 People working in the ICT sector as percentage of total regional employment 2011

Results and feedback from the workshop

In general, indicators provided by ESPON projects and presented within the evidence package are considered useful for the North Sea Region. However, some aspects may limit the usefulness. They might provide opportunities to further improve the presented indicators.

First of all, some indicators seem to be dated, due to the fact that either the projects were conducted a few years ago, or the data sets are rather old. The main reason is that it takes some time to collect and harmonise data sets at European level.

Another factor that may hamper an indicator's usefulness, concerns the territorial level at which it is calculated and presented. To use data on territorial patterns of innovation for example, NUTS2 regions might give a description of the European pattern. Yet, it would be desirable if it were more specific and detailed – both regarding content and regarding the territorial scale. Again, an indicator on Intramural R&D expenditures would have been more useful displayed at a lower level and taking into account the presence of innovation/research hotspots.

A third factor regards the complexity of indicators. Composite indicators that combine several and very different dimensions and sub-indicators can be difficult to understand in policy processes.

Programming steps

Focussing on details concerning the five programming steps, the reviewed indicators are relevant both for the needs analysis and the selection of projects within the framework of the Programme. The situation is more differentiated when it comes to the programming steps 'thematic concentration', the 'monitoring system of indicators' and 'stakeholder dialogue'.

Further suggestions

Intramural R&D expenditure	<ul style="list-style-type: none">- decompose into private and public share- interpret the indicator coupled with the Territorial patterns of innovation (KIT)
Knowledge-intensive services	<ul style="list-style-type: none">- split by different economic sectors- interpret the indicator coupled with the Territorial patterns of innovation (KIT)- complete the indicator with another on regional available human resources
Territorial patterns of innovation	<ul style="list-style-type: none">- validate and complete the clusterisation with lower level data (NUTS3/NUTS4) and local authorities contributions- add an indicator measuring research specialisation and research hotspots
Private use of e-commerce	<ul style="list-style-type: none">- could be combined with other issues: use of the internet, broadband access, digital lifelong learning- distinguish between SMEs, technological products and social systems, sparsely vs. densely populated areas- interpret as an e-cohesion indicator for remote areas- add an indicator on the economic weight of the ICT sector

1.2 Sustainable Growth

Sustainable growth refers to promoting a more resource efficient, greener and more competitive economy. Within the Europe 2020 Strategy it means e.g. building a more competitive low-carbon economy that makes efficient, sustainable use of resources, protecting the environment, reducing emissions and preventing biodiversity loss, capitalising on Europe's leadership in developing new green technologies and production methods, and introducing efficient smart electricity grids. In the framework of the Europe 2020 Strategy it means focus on competitiveness, resource efficiency, climate change and biodiversity.

The EU's 2020 sustainable growth headline targets are neatly expressed in the "20/20/20" formula. It stands for a 20% reduction in greenhouse gas emissions compared to 1990 levels; plus 20% of our energy to come from renewable resources, and finally a 20% increase in energy efficiency. Each country then sets its own targets within these.

The Europe 2020 strategy sees sustainable growth not purely as environmental protection. Rather the aim is to look for ways that growth can be both in harmony with the environment, but also less vulnerable in the future to the kind of economic crises that have so damaged economies since 2007/2008. We need to understand, and act upon, the ecological and environmental drivers of competitiveness and cohesion.

While focussing on global challenges such as climate change, sustainable growth ultimately depends on place-based actions. The territorial perspective is again to refine understanding of what kind of interventions in what places can steer regions and Europe as a whole onto the path to a green economy and sustainable growth. In this respect also potentials for blue growth deriving from maritime resources are of interest.

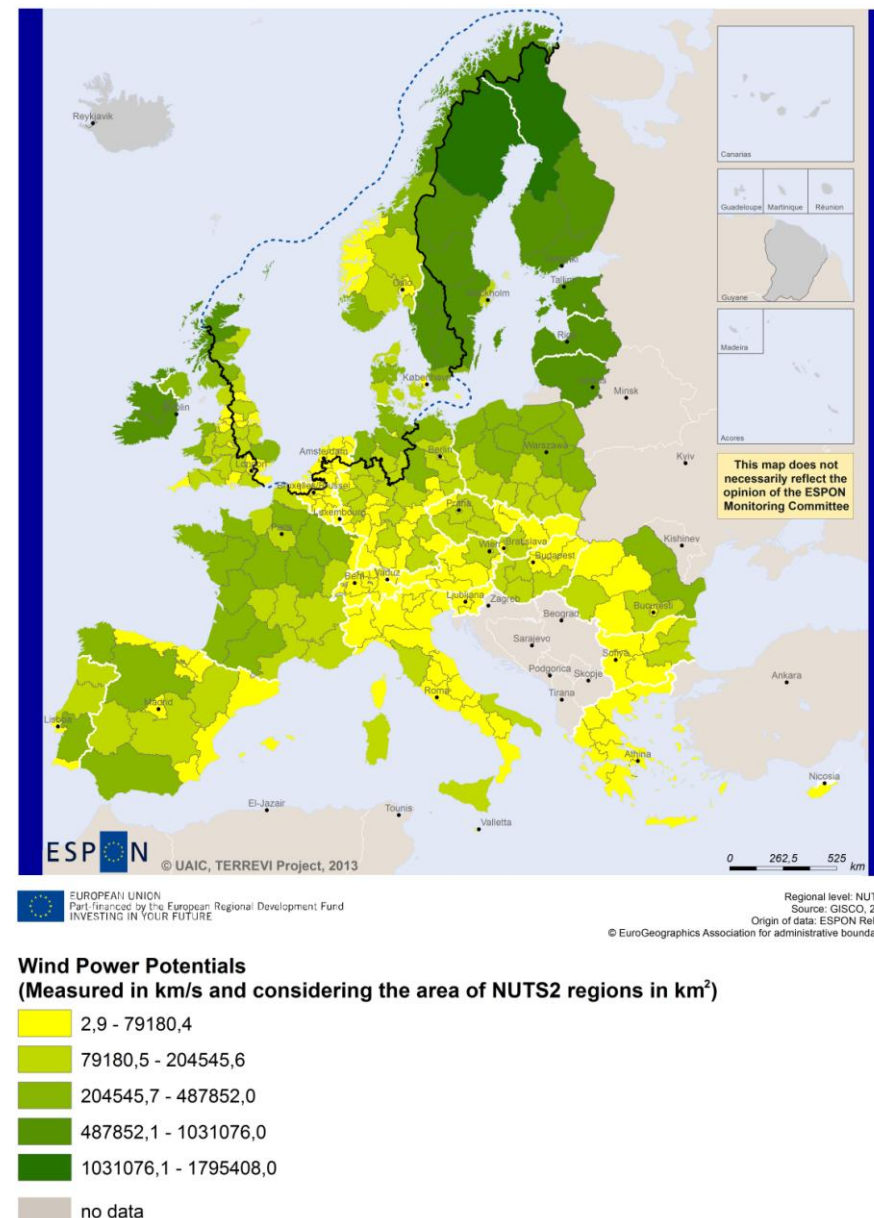
Wind power potential

The use of wind energy potential could be one of the cornerstones in building a competitive low-carbon economy in the EU. Yet, wind power potential does not only highlight the regions with high wind speeds but with the greatest wind power potential, i.e. it takes the size of large areas into account. The map takes into account some, mainly environmental, restrictions which limit the possibility to put up wind farms. Following EEA's recommendations, Natura 2000 areas are excluded in order to calculate constrained potentials. Although it is not illegal to site wind farms in these areas, they provide a proxy for the restrictions implied by biodiversity protection. Hence, the map indicates how much energy might be feasible in practical terms.

The greatest potentials for wind power are located in Sweden, Finland and the Baltic states but also in northern Norway, Scotland and Ireland. Beside the Baltic Sea (incl. Barents Sea), the regions located at the Atlantic Ocean hold greatest potentials for using wind power. In contrast, Mediterranean regions and those close to the North Sea, like the Netherlands or Belgium, have comparatively low values despite their coastal geographic position.

Most regions of the North Sea Region have medium or high wind power potential. That means that the area holds more potential than the southeast of Europe on the one hand, but less potential than the states of the Baltic Sea on the other hand. Within the programme area, northern regions (Sweden and north-western Scotland) have much higher wind power potentials than regions in Belgium or the Netherlands. However, considering certain disparities, many regions show medium potential. This provides some opportunities for the programme area to tap the full wind power potential because wind power could be of relevance and of interest for most regions and could therefore be strengthened on supra-regional and transnational level.

This map was produced for the ESPON ReRisk project.



Map 10 Wind power potentials

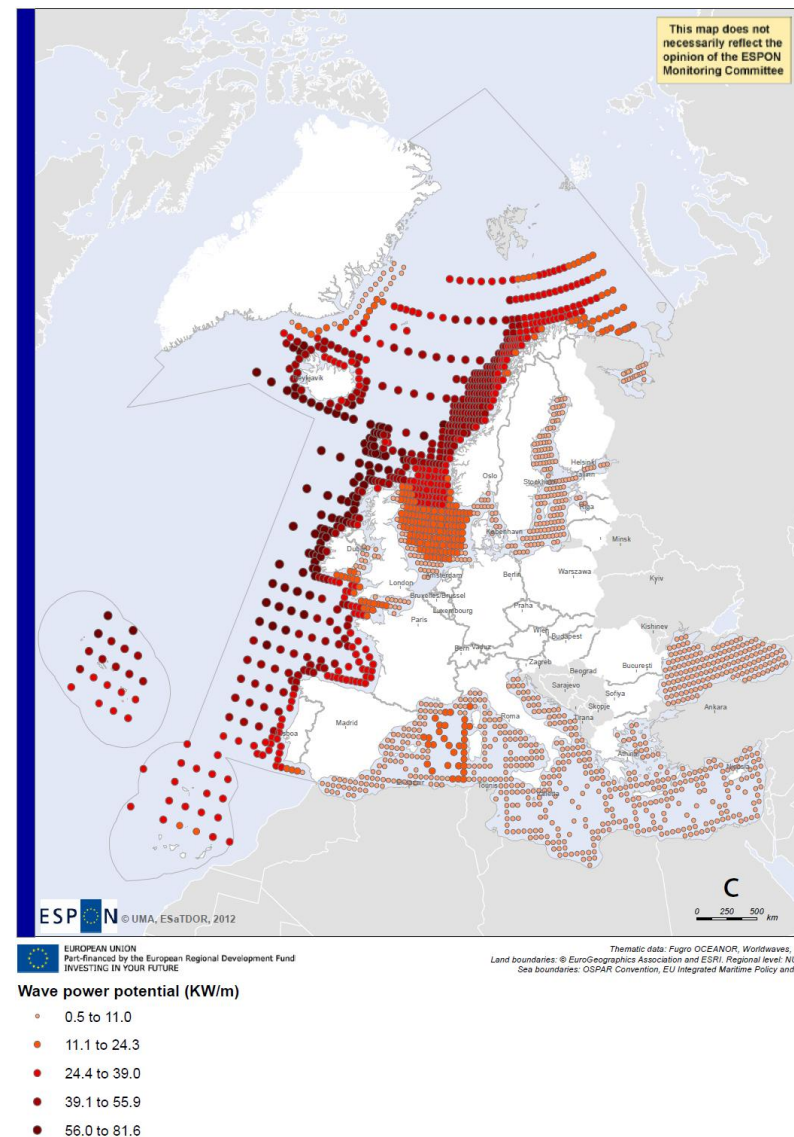
Wave power potential

A considerable amount of research effort is currently going into assessing the energy potential of Europe's seas. For example, the FP7 ORECCA project has mapped the likely energy potential of wave power. Wave power energy as offshore renewable, i.e. 'blue' energy, is important for the European strategy on 'Blue Growth'. This strategy is still at an early stage of development and therefore provides opportunities for future marine and sustainable maritime growth. It claims to be suitable for minimizing land-use requirements and reducing greenhouse gas emissions. However, the development of marine renewables depends on many factors. Wave energy is much more difficult to capture, and technological development remains at an experimental stage. The take-up of tidal energy is also more challenging, especially as the physical opportunities for development are much more limited and are frequently in sensitive coastal or estuarine locations. Research efforts are, nonetheless, ongoing; for example, the *Pelamis* wave energy convertor has been trialed in Scottish and Portuguese waters.

Western coastal areas fully exposed to the Atlantic have the greatest capacity to develop wave power, followed by open areas in the North and single areas in the Mediterranean Sea. However, enclosed sea areas like the most parts of the Mediterranean, the Baltic or the Black Sea have relatively little potential in this regard.

As mentioned above, the programme area comprises many coastal areas with a great capacity to develop wave power. Therefore, a large northern part of North Sea Region provides opportunities to promote this increasing field of renewable 'blue' energy. In a European perspective, only the Atlantic Area provides highest extensive opportunities. Nevertheless, all environmental and seascape-related aspects have to be taken into consideration since coastal areas, as environmentally sensitive areas, and land- and seascapes need special protection because of their land-/seascape and wildlife value.

Information on solar power can be found in the ESPON ReRisk report. For further information on tidal power, see ESPON ESaTDOR report. This map was produced for the ESaTDOR project.



Map 11 Wave power potential (kW/m)

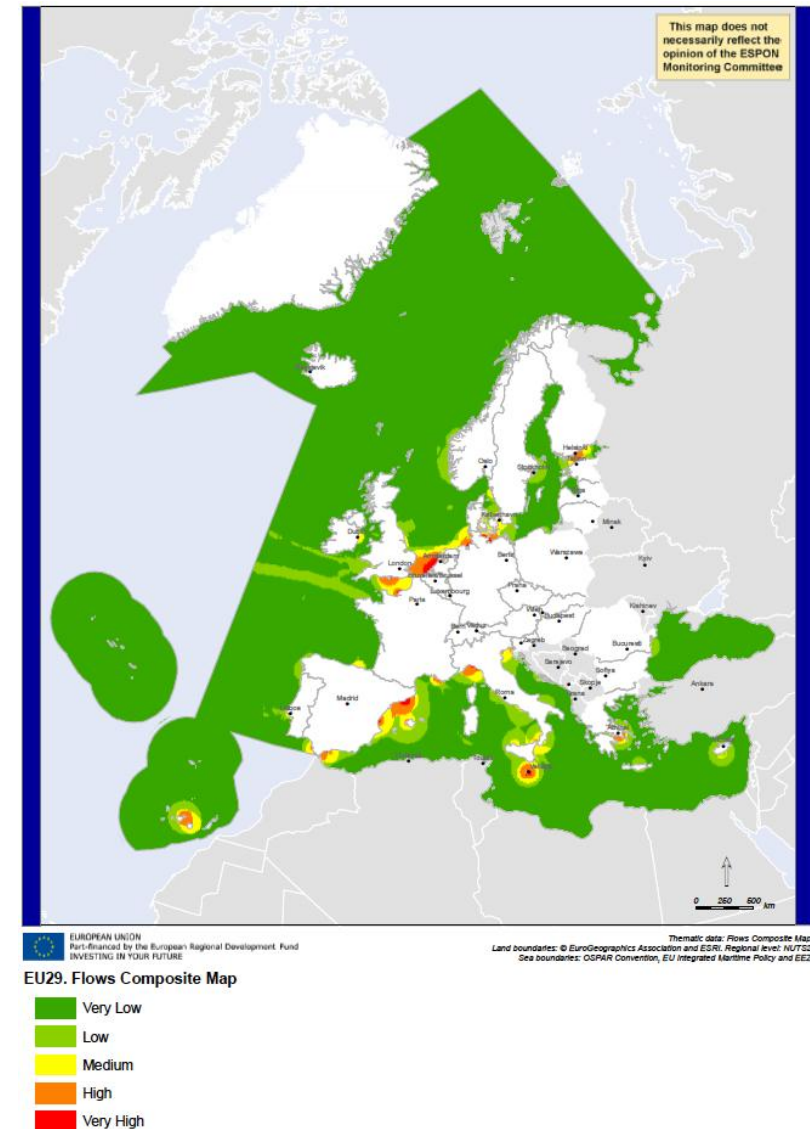
Maritime flows

Maritime flows represent influences generated by land-sea interactions of people, goods and information moving through the seas, i.e. container traffics, cruise passengers, liquid bulk (oil and gas) and submarine telecommunication cables. As a composite indicator it aggregates the following flows:

- Flows of goods: Economic influence of container ports, based on port proximity and container volume (weighting 50%),
- Flows of people: Economic influence of cruise ports, based on port proximity and cruise passenger volume (weighting 30%),
- Flows of energy: Marine exposure due to port influence, based on port proximity and volume of energy (weighting 10%),
- Flows of information: Undersea cable influence, based on proximity to cable and length per grid square (weighting 10%).

Two areas of high maritime activity are detected. First high activity area of flows is concentrated between Le Havre, in France, and Bremen, in Germany. In this coast the main ports of freight transport of the northern range are concentrated (Rotterdam, Hamburg, Antwerp, Bremerhaven, Felixstowe and Southampton). A second high activity area of flows is identified in the Mediterranean, where container activity is slightly smaller but where the main ports of cruises are concentrated, such as in Barcelona and Palma de Mallorca, Napoli, Livorno and Civitavecchia, Piraeus and Malta.

Some hotspots of maritime flows are located in the North Sea Area. These hotspots are situated in regions highly affected by container shipping and cruise activity in particular in the North Sea, i.e. the English Channel and the Dutch coast. This map was produced for the ESPON ESaTDOR project.



Map 12 Maritime flows

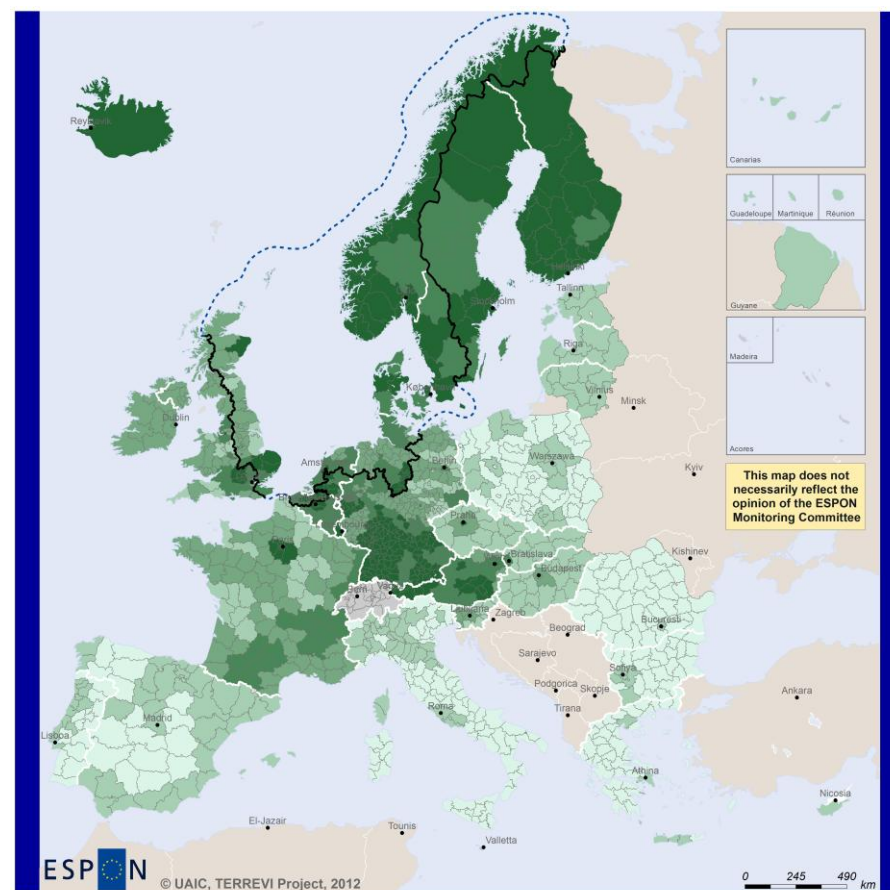
Combined adaptive capacity to climate change

Adaptive capacity to climate change takes into account the economic, socio-cultural, institutional and technological ability of a region to adapt to the impacts of a changing regional climate. This could mean both preventing and/or moderating potential damages, and taking advantage of new opportunities opened up by climate change. A total of 15 indicators were developed and then aggregated to reflect on the five adaptation dimensions. The overall adaptive capacity was calculated by combining these dimensions.

Indicator	Dimension	Weighting
Educational commitment	Knowledge and awareness	23%
Computer skills		
Attitudes towards climate change		
Resources for technology	Technology	23%
Capacity to undertake research		
Patents		
Transport	Infrastructure	16%
Water infrastructure		
Health		
Government effectiveness	Institutions	17%
NAS		
Democracy		
Income per capita	Economic resources	21%
Age dependency		
Unemployment		

Firstly, a difference in adaptive capacity can be distinguished between Northern and Southern Europe. Overall, Nordic countries have the highest capacity. A second group with regional disparities but still dominated by regions with high and medium capacity encompasses Germany, France, the UK, Austria and the Benelux countries. In Eastern European and Southern European countries with low and lowest capacity, capital city and urban regions generally hold higher capacity than other regions within the country.

The North Sea Region has generally a quite high combined adaptive capacity. However, there are high internal disparities. Regions belonging to the three Nordic countries enjoy at least a high adaptive capacity. German, Dutch and Belgium regions report a medium to high adaptive capacity. In the UK, only a few regions from the North Sea side have a high adaptive capacity, most of them show a low to medium adaptability. This map was produced for the ESPON Climate project.

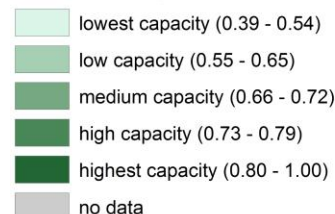


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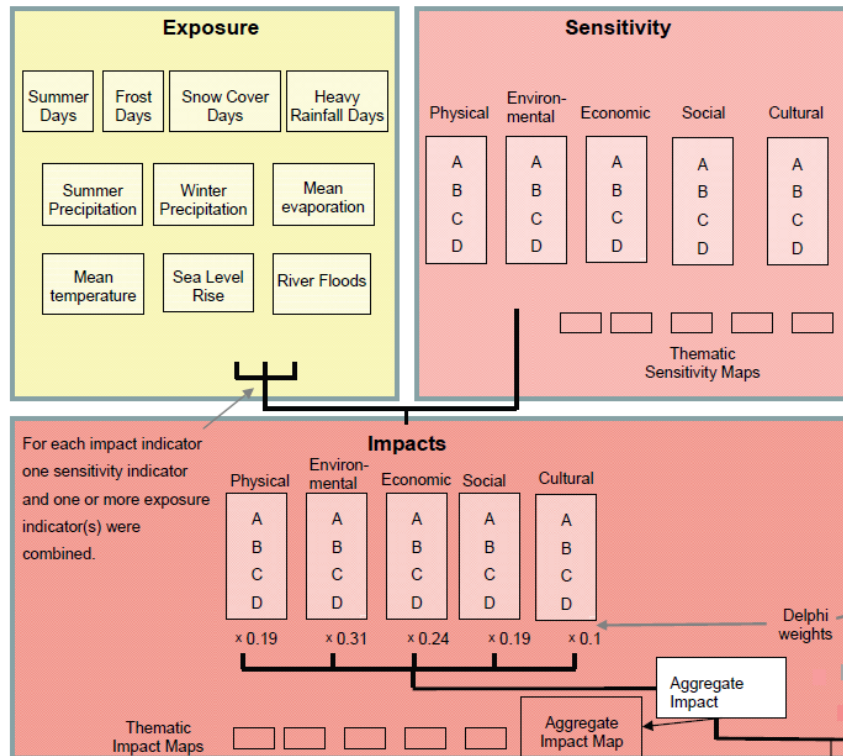
Overall Capacity to Adapt to Climate Change



Map 13 Combined adaptive capacity to climate change

Potential impact of climate change

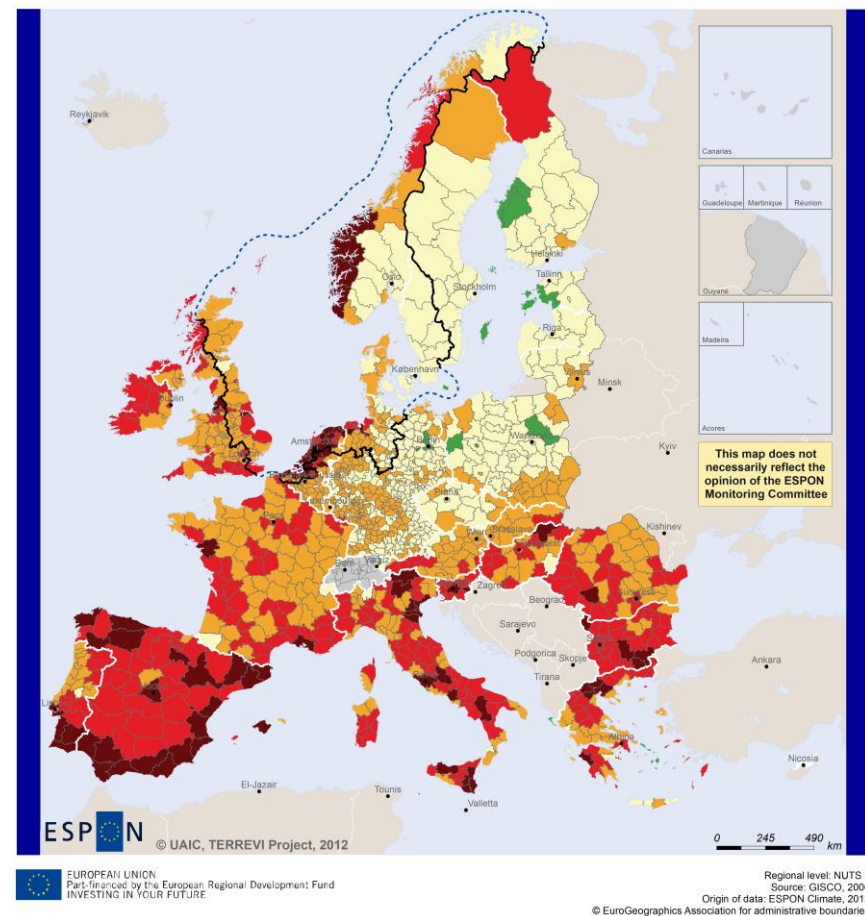
The map of potential impact combines 10 indicators of 'exposure' to climate change with 5 dimensions of 'sensitivity' to climate change.



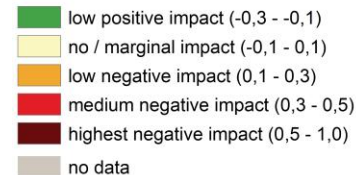
Taking into account certain exceptions like the Netherlands or Ireland, especially Southern regions will face highest impacts, i.e. those regions which only show low and lowest adaptive capacities.

The North Sea Region shows a west/east gradient. Regions in the Netherlands, Belgium, Norway and to a lesser extent in the UK will face highest negative impacts, while most regions in Sweden, Denmark and Germany will be affected by low to marginal negative impacts. Moreover, for some regions more severe changes can be expected at Dutch and German coastlines but also in Denmark and France.

This map was produced for the ESPON Climate project. See the Final Report for maps on 'exposure' and 'sensitivity' indicators.



Aggregate impact of climate change



Map 14 Aggregate potential impact of climate change

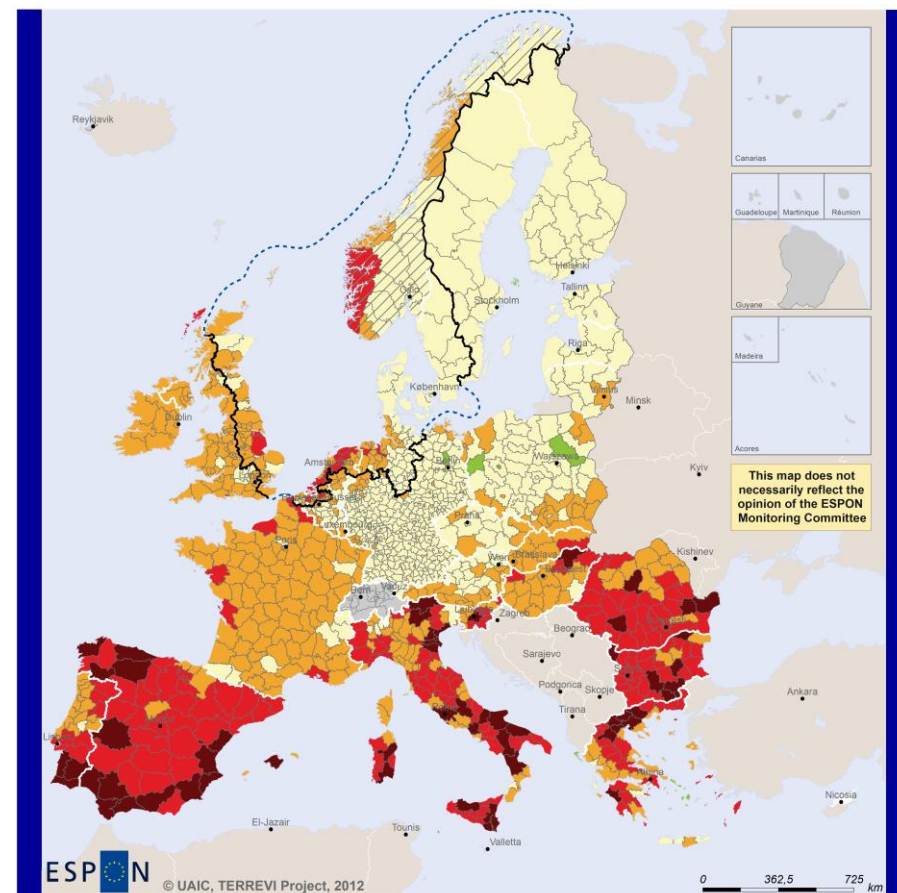
Potential vulnerability to climate change

In order to determine the overall vulnerability of regions to climate change, the impacts and the adaptive capacity to climate change were combined for each region. The underlying rationale is that a region with a high climate change impact may only be moderately vulnerable if it is well adapted to the anticipated climatic changes. On the other hand, high impacts would result in high vulnerability to climate change if a region also has a low adaptive capacity⁴.

The south-north gradient which was already visible on the adaptive capacity and the potential impact map is now much more obvious. This is due to the considerable adaptive capacity of Scandinavia and Western European countries. Furthermore, those countries which only have less adaptive capacity, have to expect a medium to high increase in impacts. In consequence, a medium to high increase of vulnerability may be expected in the Mediterranean countries and in South-East Europe. This scenario runs counter to territorial cohesion because climate change would trigger a deepening of the existing socio-economic imbalances between the core of Europe and its southern and south-eastern periphery.

The North Sea Region shows a west/east gradient. Regions in the Netherlands, Belgium, Norway and to a lesser extent in the UK will face low to medium negative impacts, while most regions in Sweden, Denmark and Germany will not be affected. Main issues for the North Sea Transnational area are flood, sea level rise, river floods, flash floods and storm surges.

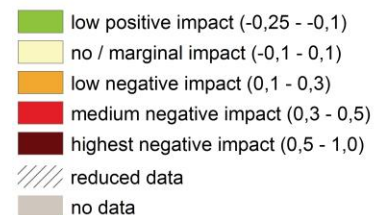
This map was produced for the ESPON Climate project.



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Regional level: NUTS 3
Source: GISCO, 2006
Origin of data: ESPON Climate, 2012
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Potential vulnerability to climate change



Map 15 Potential vulnerability to climate change

⁴ http://www.espon.eu/main/Menu_Publications/Menu_MapsOfTheMonth/map1201.html

Air pollution

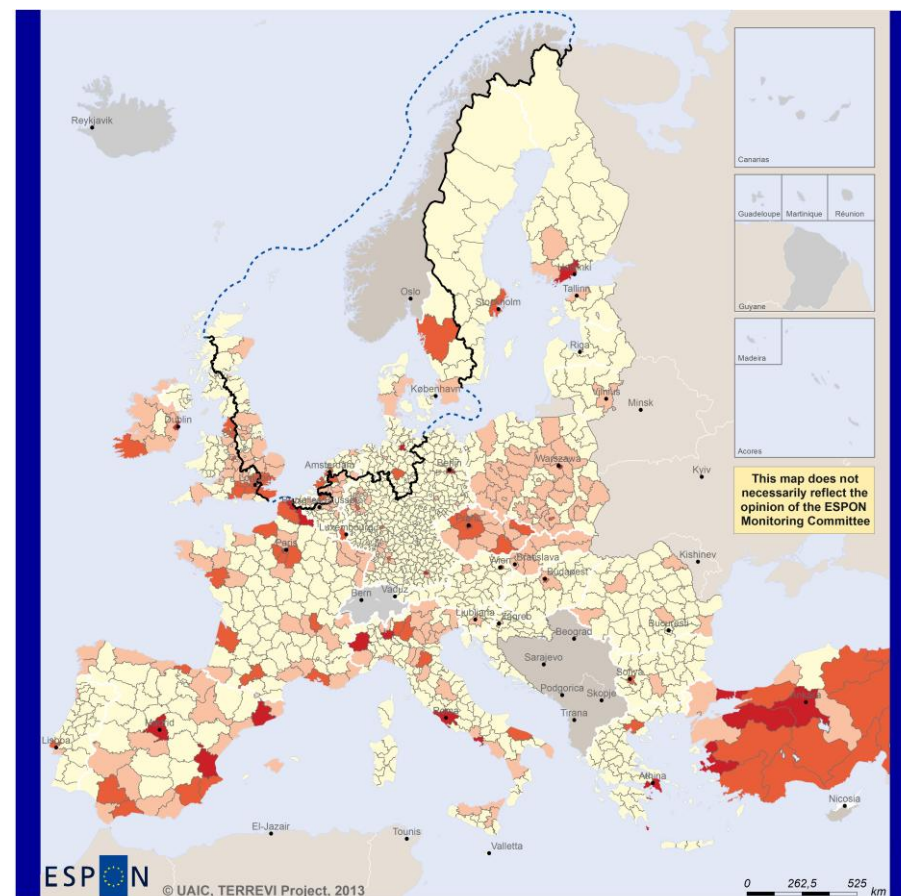
This indicator shows GHG emissions expressed in CO2 equivalents. It is assumed that regional GHG emissions follow the regional distribution of final energy consumption which is further exemplified using population and GVA data at regional level. Datasets only indicate where consumers buy their fuel without acknowledging where this fuel is emitted. Therefore, one of the most important caveats concerns the cross-border effects related to GHG emissions in the transport sector.

GHG emissions play an important role in the context of climate change. Sustainable growth includes the promotion of low-carbon, resource-efficient and competitive economy. In this context, the reduction of CO2 emissions by 20 per cent as compared to the 1990 levels is on the headline targets of the Europe 2020 strategy.

Metropolitan areas in Europe are the main responsible for GHG emissions. Consequently, these areas play a crucial role for achieving the sustainable growth and GHG emissions goals set in the Europe 2020 strategy. Rural and less densely populated areas tend to have lower levels of GHG emissions. However, in some rural areas in Turkey, for instance, levels of GHG emissions are similar to those observed in urban areas. The urban-rural difference is largely explained by the fact that one of the variables used in the model is population.

In North Sea area, the air pollution, measured by GHG emissions, mainly concentrate in large metropolitan and urban areas. There is a clear evidence for rural, low-density and depopulated areas.

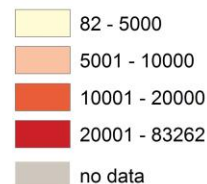
This map was produced for the ESPON SIESTA project.



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Regional level: NUTS 2, NUTS 1 & NUTS 0
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Origin of data: ESPON SIESTA
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Estimated GHG emissions (Gg CO2 equivalent), 2008



Notes (according to SIESTA Project):

Data for TR is shown at NUTS2 level.

GHG data excluding land use, land use change and forestry (LULUCF).
Derived from UNFCCC GHG data at national level
and allocated to NUTS3 areas in relation to population and gross value added.

Population data for Italy is for 2007.

Map 16 GHG emissions, 2008

Results and feedback from the workshop

In general, indicators provided by ESPON projects and presented within the evidence package are considered useful for the North Sea Region. However, some aspects may limit the usefulness. They might provide opportunities to further improve the presented indicators.

First of all, some indicators seem to be dated, due to the fact that either the projects were conducted a few years ago, or the data sets are rather old. The main reason is that it takes some time to collect and harmonise data sets at European level.

Another factor, which may hamper an indicator's usefulness, concerns the territorial level at which it is calculated and presented. To use data on wind power potentials, NUTS2 might give a description of the European pattern. Yet, it would be desirable if it were more specific and detailed regarding the territorial scale because potentials could differ considerably between coastal and inland areas.

A third factor regards the complexity of indicators. Composite indicators that combine several and very different dimensions and sub-indicators can be difficult to understand in policy processes. Potential vulnerability to climate change, for example, combines adaptive capacity with impacts of climate change. On the other hand, these sub-indicators are also complex composite indicators.

Programming steps

Focussing on details concerning the five programming steps, the reviewed indicators are mainly relevant for the needs analysis and thematic concentration. The situation is more differentiated when it comes to the programming steps 'project selection' and 'stakeholder dialogue' and to monitoring of the programme.

Further suggestions

Wind power potential	<ul style="list-style-type: none">- integrate off-shore wind potential- address transmission, stockage and losses problems- add its share on the total potential of renewable energy sources- take into account other relevant local renewable energy sources (e.g. wave power potential);
Ozone concentration exceedances	<ul style="list-style-type: none">- compare with health expenditures- complete with indicators on CO₂, Pm10 and SO emissions- interpret together with metropolitan pattern
Combined adaptive capacity to climate change	<ul style="list-style-type: none">- maps on single indicators and dimensions necessary to understand this composite indicator (available in the Climate Report)
Potential vulnerability to climate change	<ul style="list-style-type: none">- maps on single indicators and dimensions necessary to understand this composite indicator (available in the Climate Report)- complete with an indicator measuring the exposure to coastal storm surge events

1.3 Inclusive Growth

Inclusive growth is an important dimension of the Europe 2020 Strategy. Inclusive growth focuses both on the pace and pattern of growth and it brings together two aspects which usually have been dealt with separately in policy-making and research: poverty and growth.

Following the World Bank, inclusive growth analytics is about policies that should be implemented in the short run, but for sustainable inclusive growth in the future. In this perspective territorial evidence can be used to analyse at a regional or city level the sources, and constraints to sustained, high growth, and not only on one group – the poor. The territorial evidence allows looking for ways to raise the pace of growth by utilising more fully parts of the labour force trapped in low-productivity activities or completely excluded from the growth process.

The main policy instruments for inclusive growth are seen in the field of productive employment. In other words, inclusive growth means raising Europe's employment rate by creating more and better jobs, especially for women, young people and older workers, by helping people of all ages anticipate and manage change through investment in skills & training, and by modernising labour markets and welfare systems ensuring the benefits of growth reach all parts of the EU.

Growth is highly dependent on levels of income, poverty, and asset inequality, but also geography, demography, governance, politics, social considerations, and the set of existing policies. These differ not only between countries, but also over time within the same country.

In territorial terms, this raises important question as to the mobility of labour force and regional difference of the labour force, as well as regional differences in related to poverty and education levels and the infrastructure and mechanisms to overcome challenges and help individuals to escape poverty and benefit from lifelong learning increasing their prospects on the labour market.

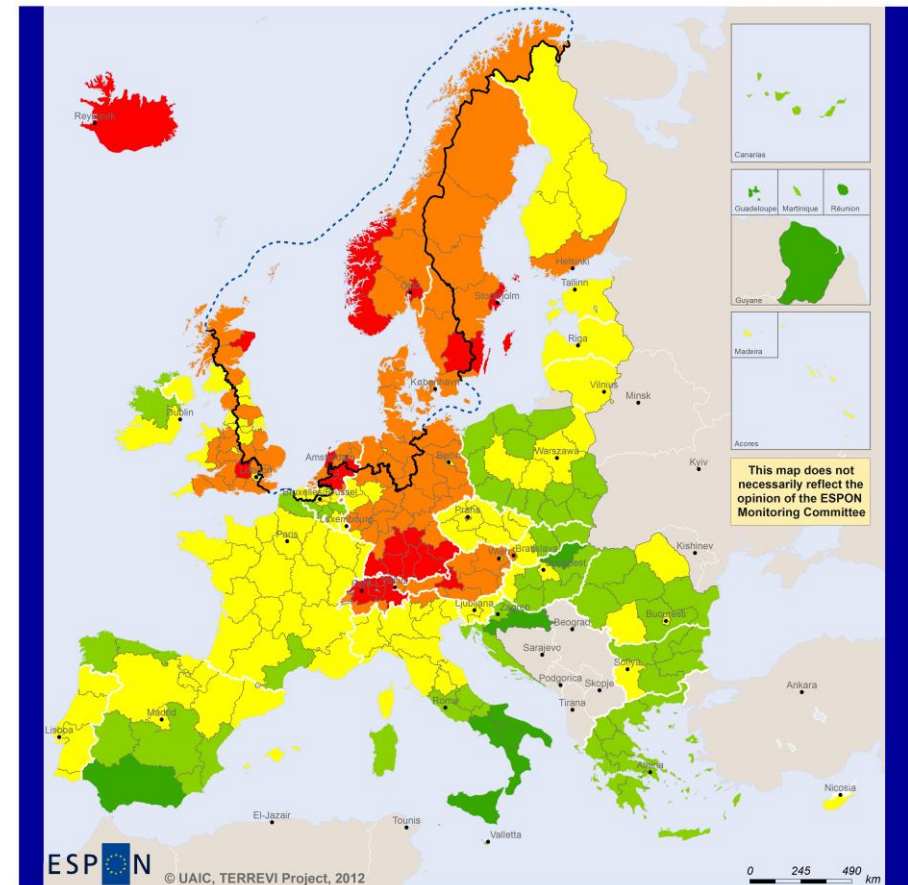
Employment rate 2011

Employment rate represents persons in employment as a percentage of the population of working age (15-64 years) (Eurostat 1998). Employment statistics are frequently reported as employment rates to discount the changing size of countries' populations over time and to facilitate comparisons between countries of different sizes. These rates are typically published for the working age population, which is generally considered to be those aged between 15 and 64 years, although the age range of 16 to 64 is used in Spain, Sweden (only until 2001) and the United Kingdom, as well as in Iceland; this age group (15 to 64 years) is also a standard used by other international statistical organisations. One has to consider that employment rates can even increase despite a total decline of people in employment.

Employment rates are above 70% in all Nordic countries (except Finland), Germany, the Netherlands, Austria, Switzerland and most parts of the UK. However, no explicit gradient (neither north-south / east-west nor core-periphery) exists, as e.g. the Baltic States, France, northern Italy, northern Spain, Portugal, the Czech Republic and some parts of Poland and Finland show employment rates above 60%. Nevertheless, most regions with rates below 60% are situated in peripheral regions in Southern, Eastern and Southeast Europe.

The European pattern seems to be primarily dominated by the national level. No explicit gradient can be detected both for Europe and for the North Sea Region. For the programme area, almost all regions show a rate above 70.1%. Regions with the highest employment rates (up to 75%) are situated in the Netherlands, in the UK and in Norway. Only Flanders and a few British regions hold a rate below 70%. Nevertheless, the Programme has amongst the highest rates.

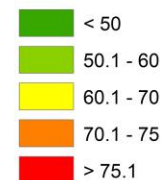
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Employment Rate (2011)



Map 17 Employment Rate, 2011

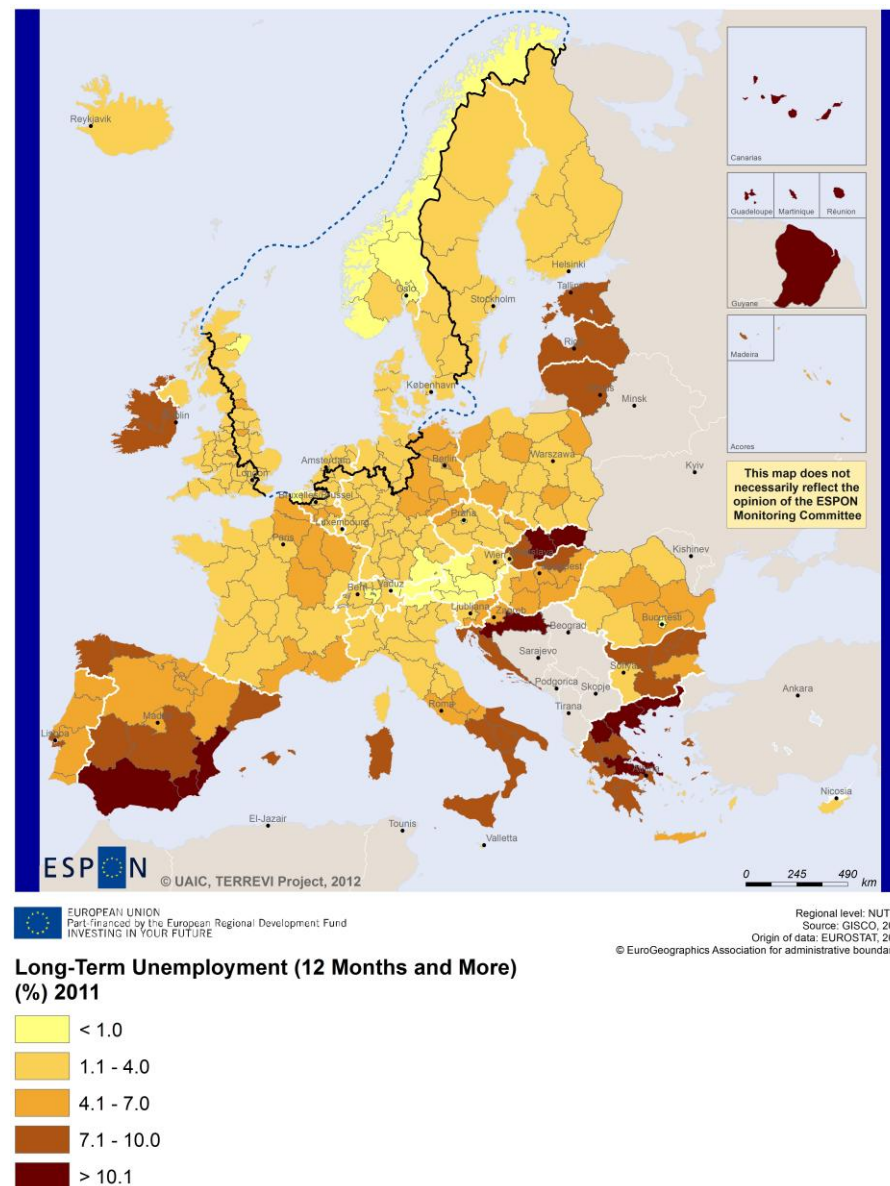
Long-term unemployment rate 2011

Long-term unemployment rate refers to the number of people who are out of work and have been actively seeking employment for at least a year. An unemployed person is defined as being aged 15 to 74 (or aged 16 to 74 in Spain, the United Kingdom, Iceland and Norway) who was without work during the reference week, was currently available for work and was either actively seeking work in the last four weeks or had already found a job to start within the next three months. The unemployment period is defined as the duration of a job search or as the length of time since the last job was held (if shorter than the time spent on a job search) (Eurostat).

There are specific countries in Europe that have all their regions with high long-term unemployment rates like Ireland, the Baltic States, Slovakia (except Bratislava), Croatia (except Zagreb) and Greece. Other states from Southern and South-eastern Europe like Italy, Spain or Romania have large areas with high unemployment rates, i.e. more than 7 %. Most parts of Europe have medium rates (1-4 %) although some regions with structural problems from Central Europe like East Germany, southern Belgium or Northern France, or from the periphery like Romania, Portugal and Spain stand out (4-7 %). On the other side, mainly regions from Austria and Southern Germany, and Norway as a non-EU country are outstanding with very low long-term unemployment rates (<1 %).

The North Sea Region differs from the main European trends, i.e. a majority of regions has the same value, and rates are not particularly influenced by the national level. Indeed, a large majority of regions belonging to the Programme area show a long term employment rate comprised between 1.1 and 4.0%. Nevertheless, a small group of outstanding regions distinguish themselves. South Yorkshire and Tees Valley and Durham are slightly lagging behind with a long-term unemployment rate comprised between 4.1 and 7.0%, while North Eastern Scotland, West Flanders and most Norwegian regions enjoy a rate below 1.0%.

This map was produced for the ESPON TerrEvi project.



Map 18 Long-term unemployment rate, 2011

Change in population in 2005-2050

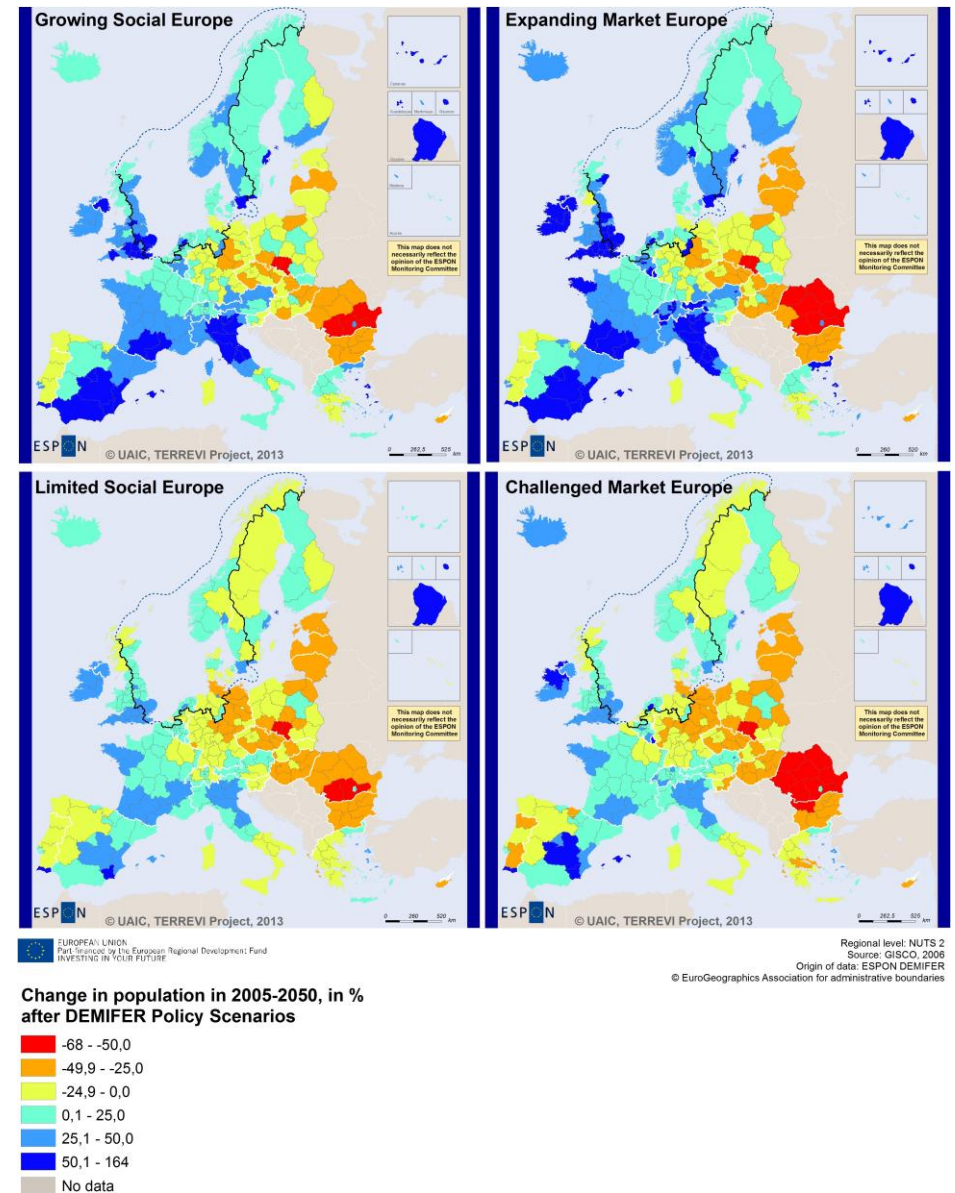
Population change is the difference in the size of a population in a given time period. The change has two components: natural population change, i.e. number of live births minus number of deaths, and net migration, i.e. number of immigrants minus number of emigrants. The maps cover the period 2005 to 2050 and show the percentage change in the projected population of each region for all four scenarios.

The "Growing Social Europe" and "Expanding Market Europe" scenarios indicate rather similar patterns for 2050. Areas affected by population growth are concentrated in an Atlantic arc from Ireland to southern France, a Mediterranean arc from southern Portugal to Italy and southern Scandinavia. Regions affected by a shrinking population are mainly located in Eastern Europe, Germany and especially in south-eastern Europe. Additionally, most regions in Portugal will face a decrease in population.

In the "Limited Social Europe" and "Challenged Market Europe" scenarios the general trend is not reversed but just the extent of population change by 2050. Even wider parts of Poland, Hungary, and Eastern Germany are affected by a population decrease of more than 50%. In these scenarios, population in western Spain is also decreasing to a higher extent than in the aforementioned scenarios. Areas of population increase remain those close to the Atlantic and the Mediterranean Sea.

None of the scenarios reverses the trend for the North Sea Region but only the extent of population change. Some regions even perform regardless of the scenario: south eastern England, Norway and Sweden are foreseen a positive labour force growth while north western Scotland, Denmark and German regions should face labour force decrease.

This map was produced for the ESPON DEMIFER project.



Map 19 Change in population in 2005-2050

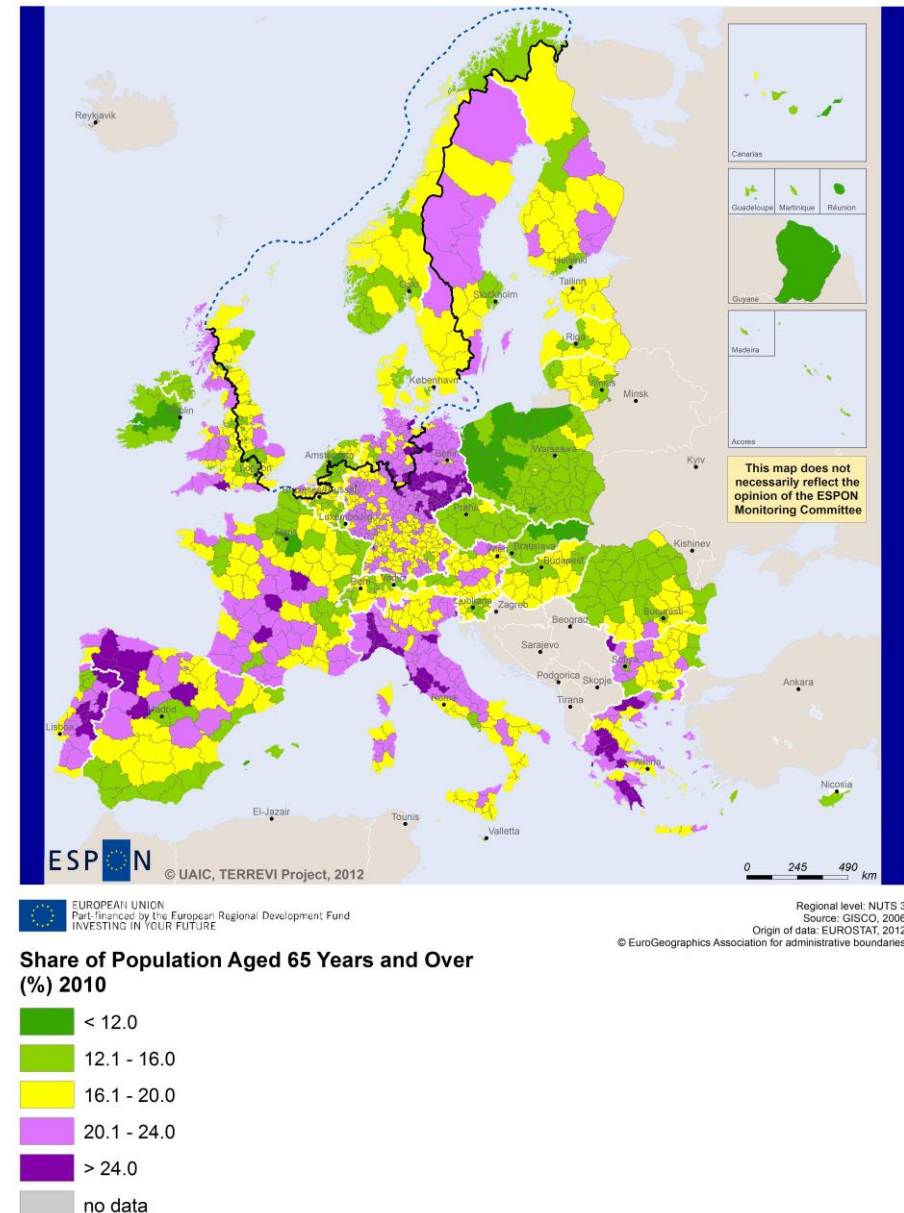
Share of old people

The ageing population within the European Union is a trend, which is likely to increase in importance in the coming decade. Consistently low birth rates and higher life expectancy will transform the demographic pyramid; the proportion of people of working age in the EU is shrinking while the relative number of retired is expanding. This will increase the burden of social expenditures, and potentially lead to a reduction in social services. The map outlines the territorial impact of this trend, showing the share of population above 65 years.

The map shows a territorial pattern with considerable differences between countries in Europe. In Poland, Czech Republic, Slovakia, Romania, Ireland and Luxembourg most regions have a relatively young population. On the other hand Greece, Germany, northern Italy, northwest Spain, Portugal and southwest France show a dominance of regions with a high share (> 20%) of old people. Furthermore a rural-urban divided can be detected; Capital regions generally have a younger population, while especially peripheral regions are impacted by high shares of old people.

The North Sea Region is affected by a diversified pattern. Only some regions of eastern England, Flanders and Germany show a high share of old population. This will be a challenge in the coming years; both in regard to coping with the consequences (e.g. extra social expenses and decreasing tax-income), but also demanding action in order to reverse this trend. Other regions show a medium share. Drivers of this pattern can be manifold: migration, traditions and culture or structures in the society.

This map was produced for the ESPON TerrEvi project.



Map 20 Share of old people, 2010

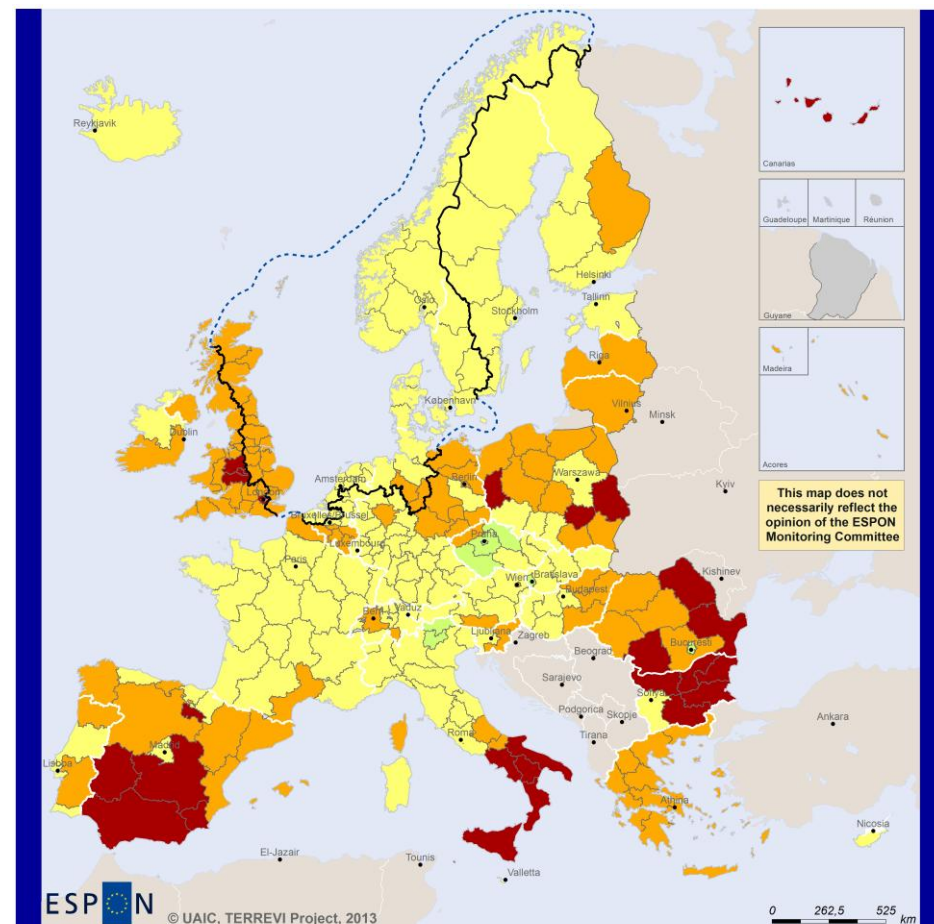
People at risk of poverty

One specific aim of the inclusive growth policy is to reduce poverty and social exclusion. To monitor this policy, an indicator showing the share of population at risk of poverty is used. The indicator covers the number of people who are at risk of poverty. The main component is an income below 60% of the median average national income (after social transfers).

In general, there are hardly any considerable variations within the most developed countries (towards the North and the West). In these countries poverty is distributed rather equally across regions. In contrast, in the Eastern and Southern countries internal heterogeneity is more pronounced, i.e. Italy, Spain, Bulgaria, Romania and Poland. This suggests that poverty has a strong territorial dimension in these countries, especially the more peripheral ones.

Focussing on the North Sea Region, it can be seen that a large majority of the regions enjoy quite low figures for population at risk of poverty rate, comprised indeed between 8 and 16%. These regions are meeting the EU 2020 target regarding this issue. Only available at national level, the UK rate is slightly higher. The reasons for poverty can differ, so while regions at the same time can corporate and learn from each other in reducing poverty. As a consequence, different reasons for poverty need various policy approaches and means.

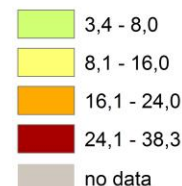
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At-Risk-of-Poverty Rate (2011)



Data for PT are shown for 2005
Data for FR and UK are shown for 2009
Data for CH, BE, DK, DE, EE, IE, IT, LU, SK, F113, F118, F11A are shown for 2010

Map 21 Population at Risk of Poverty, 2011

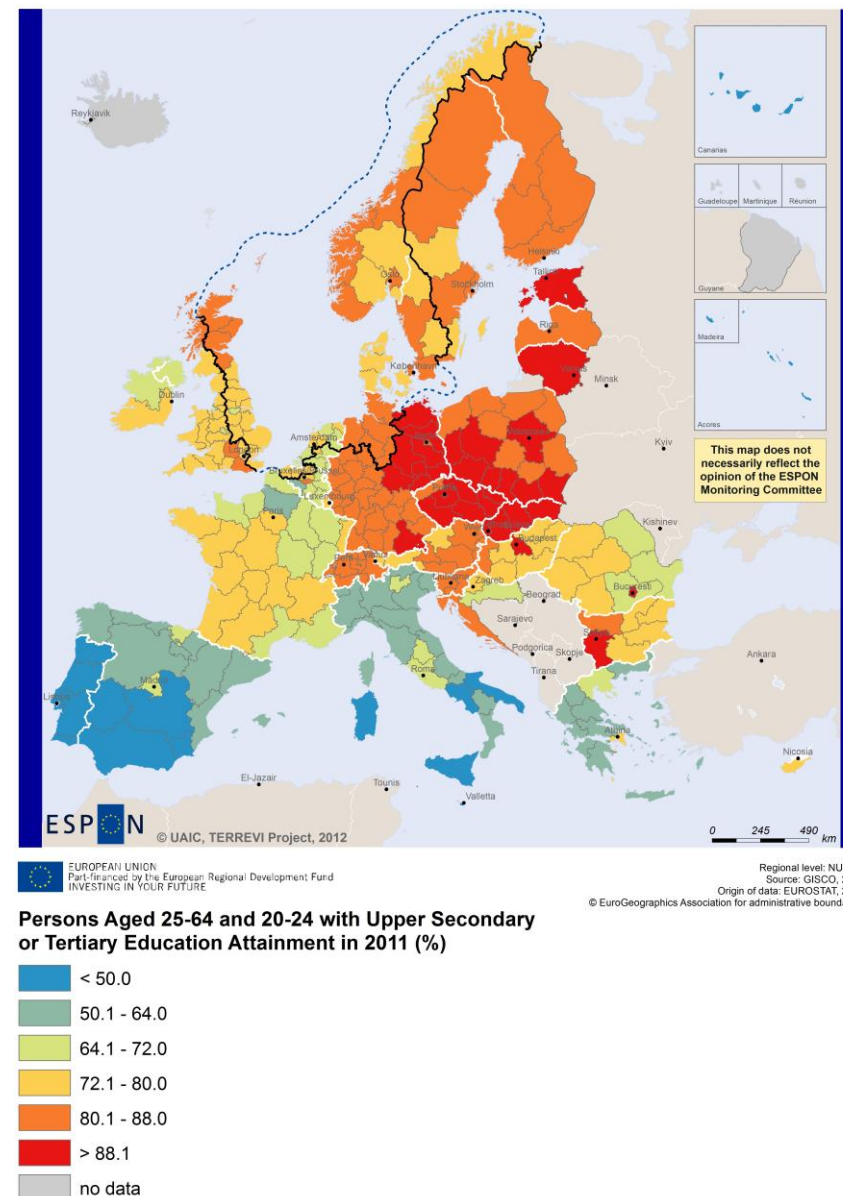
People with high education

The map shows the percentage of the adult population that has completed upper secondary or tertiary education. Upper secondary education (ISCED 3) generally begins at the end of compulsory education. The entrance age is typically 15 or 16 years. Entrance qualifications are usually needed. The typical duration of upper secondary education varies from two to five years. It may either be "terminal" (preparing for entry into working life) or "preparatory" (i.e. preparing for tertiary education) but usually corresponds to the final stage of secondary education. Tertiary education (ISCED 5 and 6) usually requires the successful completion of upper secondary education. It includes both programmes with a theoretical and an occupational orientation but also studies that lead to an advanced research qualification.

Portugal, Spain, Italy and Greece all lack behind the rest of Europe in this regard. Most regions in these countries do only have a share below 64% of the population having obtained at least an Upper Secondary degree. Best performing regions are found in North-Eastern Europe with most regions having a share higher than 72%. Regions in France, Ireland, the Benelux countries and Romania range between shares of 64% and 80%. The map indicates a pattern showing high dependency on the country, to which a region belongs. This indicates that the social structure and the structure of the national educational system have a great influence on the level of education of the population.

In the case of North Sea TNC Programme the regions values are relatively balanced and close to the EU average. German, Swedish, and Scottish parts of the Programme have the highest rates, with above 80% persons having received upper secondary or tertiary education. Dutch regions outside the capital city and British South Yorkshire have the least profitable situation with 64.1 to 72.0% of such educational attainment. Results, however, can be counterbalanced by the development in these countries of adults participating in education and training.

This map was produced for the ESPON TerrEvi project.



Map 22 Persons aged 25-64 and 20-24 with Upper Secondary or Tertiary Education Attainment, 2011

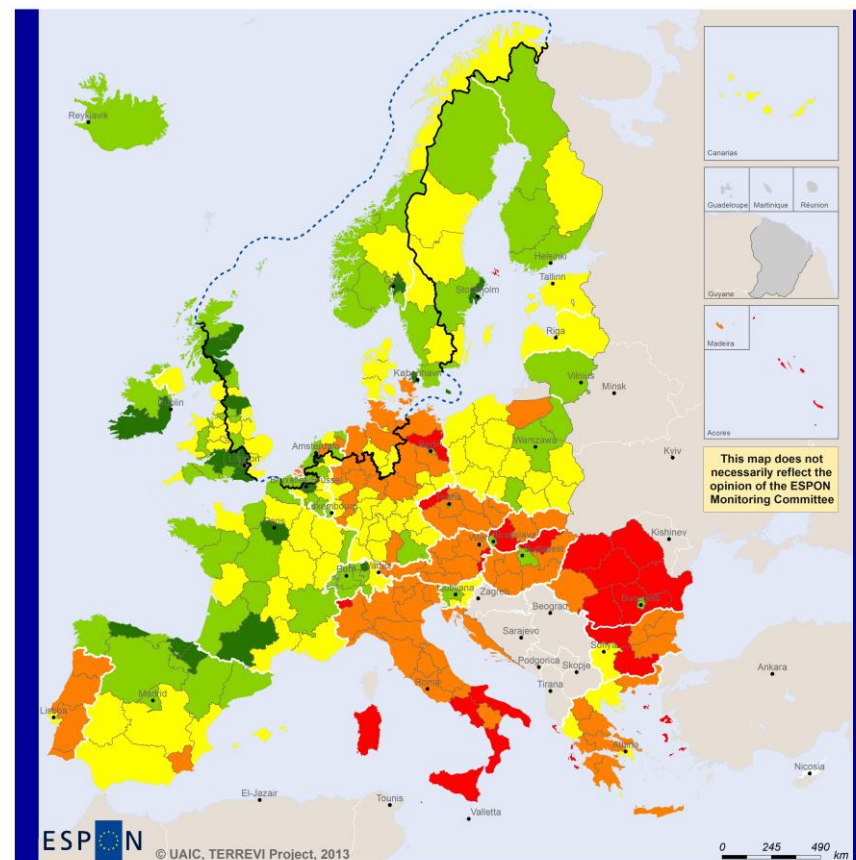
Young academics

A share of 40% of regional population aged 30 to 34 years with tertiary education attainment is one main headline target for inclusive growth within the Europe 2020 strategy. It can be seen that about ¼ of all regions already reached this target.

Highest shares are to be stated for northern Spain, France, the UK and Nordic countries. Surprisingly, northern German and Austrian regions score very low. On the other hand, capital regions of Eastern Europe like Warszawa, Bratislava, Ljubljana or Sofia stand out as regions where population with tertiary education attainment agglomerates. Besides Germany and Austria, mainly Eastern and Southern European countries (except Spain, Poland and the Baltic states) show values of less than 30% - some even less than 20% - of total population aged 30-34 with tertiary education.

For the North Sea Region, several regions in the UK, in the Netherlands, Denmark and Sweden have already met the target. However, some regions of the UK and Germany, in particular, show values below 30% and therefore verges to fall behind within the North Sea Region.

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Persons aged 30-34 with tertiary education attainment (%) 2012
EU 2020 Target = 40%

Below EU2020 Target

< 20,0
20,1 - 30,0
30,1 - 40,0

Above EU2020 Target

40,1 - 50,0
> 50,1

no data

Data for Valle d'Aosta (2008), Ciudad Autónoma de Ceuta (2010)
Brandenburg – Nordost, Brandenburg – Südwest, Chemnitz,
Leipzig, Ita-Suomi, Etela-Suomi, Pohjois-Suomi, Provincia Autonoma
Bolzano/Bozen, Provincia Autonoma Trento, Veneto, Friuli-Venezia
Giulia, Emilia-Romagna, Toscana, Umbria, Marche, Lazio,
Cheshire, Merseyside (2011)

Map 23 Regional population aged 30 to 34 with tertiary education, 2010

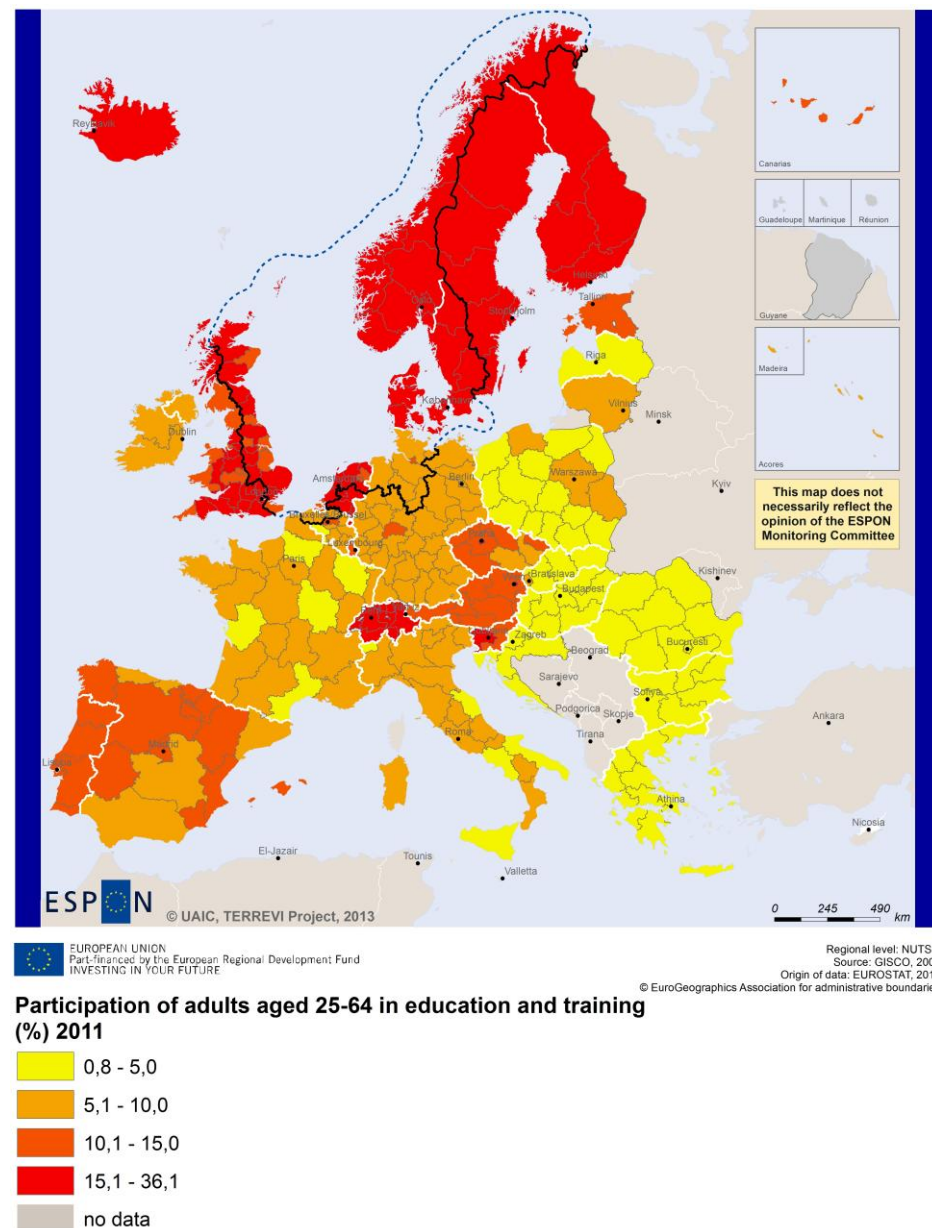
Adults in education and training

For improving and maintaining the skills of the labour force, adult education is an important instrument. Life-long learning is the reality and a pressing demand of today's labour market. Furthermore, it can be an important tool to improve the general level of education in the population and thereby potentially reduce the risk of poverty. The map shows the percentage of the working age population (age 25-64) attending adult education or training.

The map reveals a sharp North-South divide, with the exception of Switzerland and Slovenian regions. The Nordic countries, the United Kingdom and the Netherlands have more than 15% of the working age population participating in adult education. Looking at the rest of Europe, in most Spanish, Austrian, Slovenian and Estonian regions still 10-15% of the working age population are in adult education. For the group of countries with a share below 10%, a further West-East divide becomes apparent. Eastern European countries generally have the lowest share of population in adult education, while German, French, Italian and Irish regions show a better performance. It is interesting to see once again that the country to a great extent is a determinant factor for the performance of a region (see map 22). Explanations of this pattern can be as simple as a lack of opportunities to attend adult education, which can be linked to traditions and infrastructure of adult education or training opportunities in the individual countries (lack of supply, support from employer or financial means to do so).

For the North Sea Region a similar pattern appears. The regions of Norway, Sweden, Denmark and the Netherlands do all have a share of more than 15%. Regions in Belgium and Germany have longer way to go as they show values situated between 5 and 10%. Especially the first cluster of regions may provide opportunities for knowledge transfer within the programme area.

This map was produced for the ESPON SIESTA project.



Map 24 Share of adults in education and training, 2011

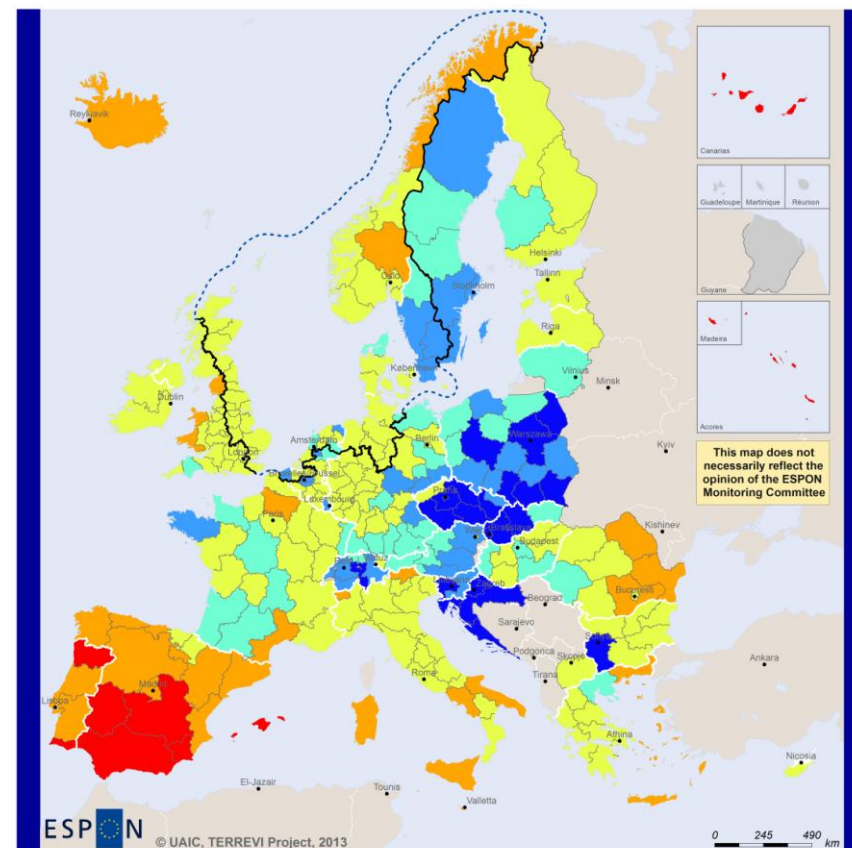
Regional early school leavers

Another headline target of the Europe 2020 strategy concerns regional early school leavers. By 2020 the share of young people (aged 18-24) without any degree is supposed to be < 10%. Therefore, the map indicates which regions have already met the target and for which regions this challenge will remain a persisting one for the next ten years.

In general, Eastern European countries perform better than many Western European countries. All regions of the corridor ranging from Switzerland and Croatia over Southern Germany, Austria and Slovenia up to Poland have already met the target. Additionally, several Scandinavian and western French regions as well as southern Ireland and single regions in the Benelux countries and Germany stand out in Western Europe. On the other hand, the worrying situation in all parts of Turkey, Spain and Portugal indicates that the regional performance of educational systems is highly influenced by the national level. Furthermore, some peripheral regions like Wales, Scotland, Iceland or northern Norway also have high shares of early school leavers.

Within the North Sea Region, most regions have not already met the target. While most regions of England are close to the target value of 10%, the problem seems to be more relevant in Scottish regions (20-30). The same pattern applies to Norway where no region has already reached the target. Single regions in Belgium, in the Netherlands, Denmark and Sweden have rates below 10%.

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Early leavers from education and training as percentage of population aged 18-24 (2010)
EU 2020 Target = 10%



Map 25 Regional early school leavers from education and training as percentage of population aged 18 to 24 (drop-out rate), 2010

Results and feedback from the workshop

In general, indicators provided by ESPON projects and presented within the evidence package are considered useful for the North Sea Region. However, some aspects may limit the usefulness. They might provide opportunities to further improve the presented indicators.

First of all, some indicators seem to be dated, due to the fact that either the projects were conducted a few years ago, or the data sets are rather old. The main reason is that it takes some time to collect and harmonise data sets at European level.

Another factor that may hamper an indicator's usefulness, concerns the territorial level at which it is calculated and presented. To use data on risk of poverty, NUTS0 (UK, NO, BE) might give a description of the European pattern. Yet, it would be desirable if it were more specific and detailed regarding the territorial scale because the rate might considerably differ between different regions.

A third factor regards the complexity of indicators. Composite indicators that combine several and very different dimensions and sub-indicators can be difficult to understand in policy processes.

Programming steps

Focussing on details concerning the five programming steps, the reviewed indicators are relevant both for the needs analysis, the programme monitoring and partially for thematic concentration. On the other hand, some indicators provided by ESPON projects are difficult to use for 'project selection' and 'stakeholder dialogue'. Indicator on participation of adults in education and training is considered suitable for identifying promising projects, while people with high education and young academics is appraised adequate to be included into dialogues with other stakeholders of the North Sea Region.

Further suggestions

Employment rate	- split by sectoral level
Long-term unemployment rate	- decompose at lower level
Change of labour force (2005-2050)	- interpret together with migration and growth patterns
People with high education	- split by age groups - split by type of education
Participation of adults in education and training	- interesting to know about long distance learning as a new perspective of ICT-based long life learning - distinguish employed/unemployed adults participating to education and training
Population at risk of poverty	- show trends

2 Territorial factors of interest for the programme area

Territorial cooperation programmes can make a difference for the future development of cross-border and transnational territories in Europe. Some of the factors can be analysed by European wide data sets and using some studies having specific maps, figures and tables concerning the areas of the cooperation region.

Besides a wide range of standard indicators frequently used in the context of European regional policies, ESPON has established various indicators which focus more on the territorial dimension. These indicators provide among others information on the development preconditions of an area. Two standard indicators in this field are rural-urban settings and accessibility.

Some of Europe's most important metropolitan areas are either part of the North Sea Region programme area or just neighbouring the area thus being of influence. Among them are e.g. London, Amsterdam, Rotterdam and Copenhagen. Furthermore, the programme area comprises a range of other metropolitan areas and secondary growth poles. The following map shows that a large share of the region consists of urban areas or intermediate areas close to a city. Rural areas are mainly to be found in the Nordic part of the programme area and there the rural areas often even are characterised as remote.

The urban areas of the region host furthermore, a number of important worldwide transport hubs and serve as global gateways for larger parts of Europe. Also when it comes to multimodal accessibility the possibility for one-day business trips within the European urban network, most of the regions urban centres are well placed. As already mentioned in the operational programme for the 2007-2013 period 'The position of the North Sea Region in Europe in the transport sector is unique, with the majority of goods passing through the region on their way to other parts of Europe. Accessibility, both of goods and persons, including communications, is an important facet in promoting and maintaining economic growth and employment'.

At the same time, the programme area comprises also some regions with the lowest accessibility values in Europe. In particular the remote rural areas in northern Norway are challenged in terms of multimodal accessibility. With regard to geographic specificities, the programme areas is clearly characterised by coastal areas and islands, but it comprises also a large share of mountain areas in particular in Scotland and Norway. Many of these mountain areas are at the same time characterised as sparsely populated.

In particular the coastal character comes with advantages and challenges. Although it does not come with a specific economic structure, it appears that a significant proportion of areas have high residential attractiveness. Furthermore, many coastal areas are also characterised by relatively high levels of biodiversity and protected areas. Furthermore, coastal ecosystems provide not only food but habitats for diverse economic-valuable and other species. At the same time the high population density and economic activities along some parts of the coast pose also considerable environmental challenges. It has to be noted that coastal areas and islands are often particularly vulnerable to climate change.

Furthermore, in order to respond to requests of local and programme authorities, some indicators of cooperation have been proposed to measure the institutional capacity and the level and quality of cooperation.

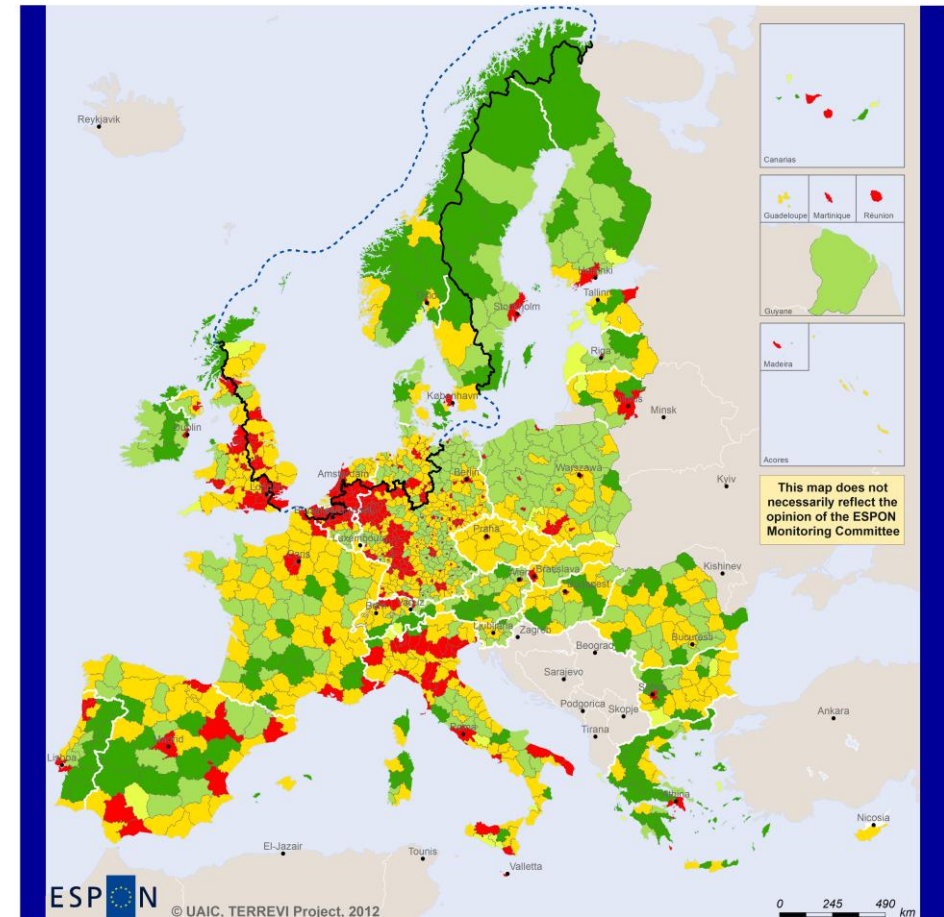
Urban-rural typology

This typology draws together various story lines. The first step is to classify all local units as urban or rural, using a criteria of population density of 150 inhabitants per square kilometre. Predominantly Urban regions are those in which less than 15% live in rural local units. Intermediate regions are defined as those in which between 15% and 50% live in rural local units. Predominantly Rural regions have more than 50% of their population living in rural local units. Intermediate and Rural regions are further divided into accessible and remote groups. A region is in the accessible group if more than half of its residents can drive to a city of at least 50,000 inhabitants within 45 minutes. Conversely, if less than half its population can reach a city within 45 minutes, it is considered remote.

At first glance, it is striking that most rural remote regions are situated in the European periphery, i.e. in Spain, Portugal, Greece, Ireland, Scandinavia and Finland. In contrast, a pattern of predominantly urban areas stretches from the UK to the Netherlands, Belgium, Germany to northern Italy. One can discern that even urban and rural remote areas can be neighbouring regions. This is a sign of Europe as a patchwork of densely and sparsely populated regions which additionally show different levels of accessibility.

Just like Europe, the North Sea Region is characterised by various patterns. There are major differences between the southern and northern parts. On the one hand, Nordic countries and Scotland are characterised by large areas being predominantly remote. On the other hand, Flanders and the southern part of the Netherlands are predominantly urban areas. The rest of the programme area is dominated by a mix of predominantly rural accessible and intermediate accessible areas, i.e. in these areas more than 15% of regional population still lives in rural local units.

This map was originally prepared for the ESPON EDORA project and re-produced for the ESPON TerrEvi project.



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Urban-Rural Typology (Dijkstra-Poelman Types)

- Predominantly Urban
- Intermediate Accessible
- Intermediate Remote
- Predominantly Rural Accessible
- Predominantly Rural Remote

Map 26 Urban-rural typology of NUTS3 regions

Regional level: NUTS 3
Source: GISCO, 2006
Origin of data: ESPON EDORA Project, 2012
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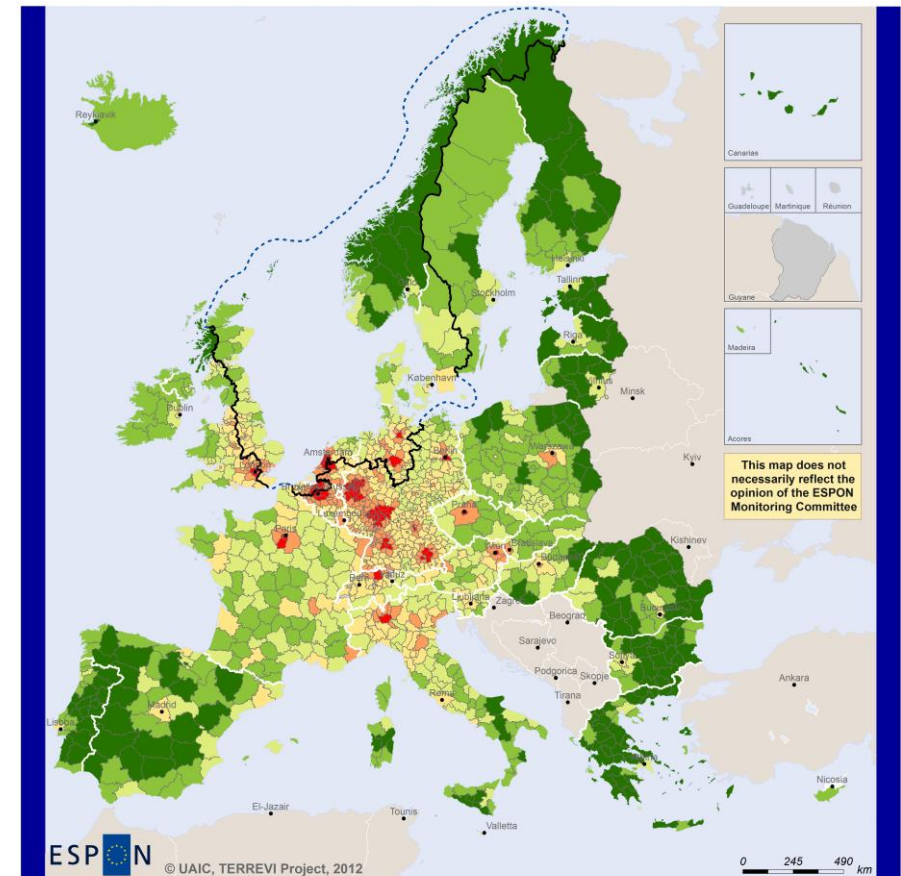
Multimodal accessibility

With the purpose of providing an overview of the degree of accessibility of European regions, multimodal potential accessibility synthesizes indicators specific for each travel mode (road, rail and air). Travel costs mainly depend on the physical distances and on the limits of travel speed. While dense road and rail networks are responsible for high potential accessibility in Central Europe, multimodal accessibility for peripheral areas primarily bases upon air accessibility.

Taking also into account an obvious core-periphery pattern, analysing multimodal accessibility moreover creates a more balanced version of this traditional European pattern. The basic core-periphery picture is constituted by road and rail transport but somehow balanced by the impact of air transport. This is especially significant for capital regions of the European periphery whose accessibility is clearly above the accessibility of the surrounding regions. However, capital regions in peripheral countries do not reach the degree of accessibility of urban regions in the European pentagon (London, Paris, Milano, Munich, Hamburg). These urban regions benefit both from high air and from high rail and road accessibility.

The North Sea Region encompasses both Europe's highest accessible and lowest accessible areas. Except for core European regions i.e. these surrounding London, Brussels, Amsterdam and Hamburg-Hanover, the only one managing to stand out is the cross border region of Øresund having good international air connections and/or good connections in long-distance rail networks. Most of the other regions are in the middle class (with less than 100% of the European average).

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Regional level: NUTS 3
Source: GISCO, 2006
Origin of data: Spiekermann & Wegener, Urban and Regional Research (S&W), 2009
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Multimodal potential accessibility, standardised 2006



Map 27 Multimodal potential accessibility, 2006

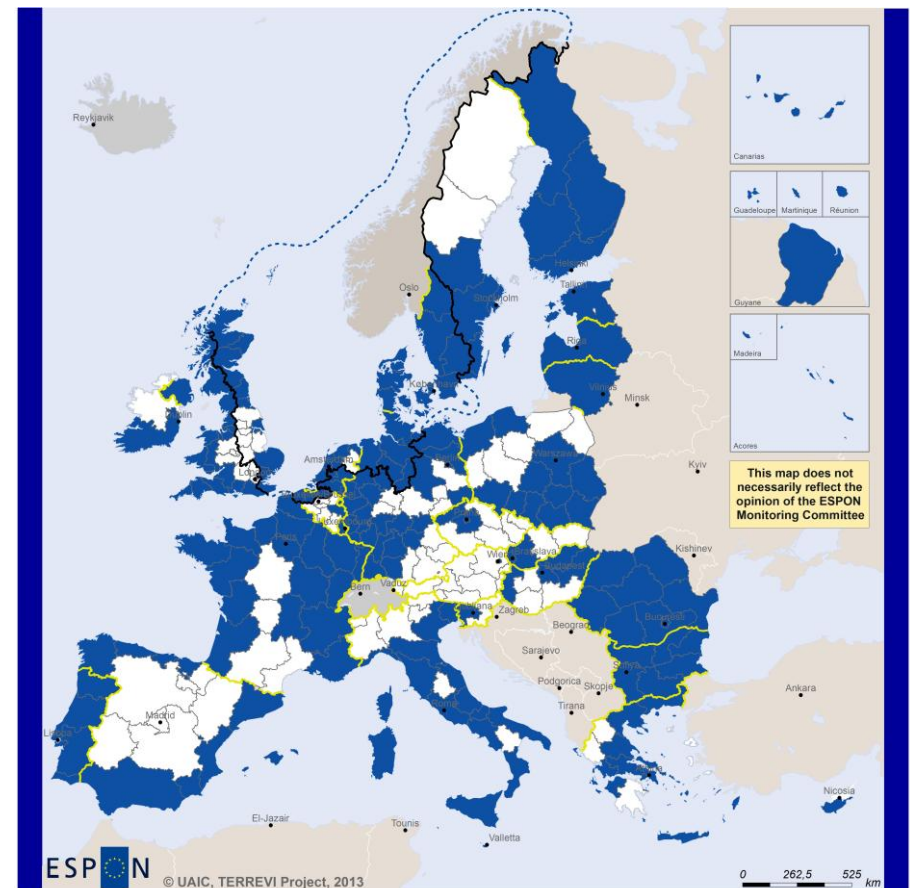
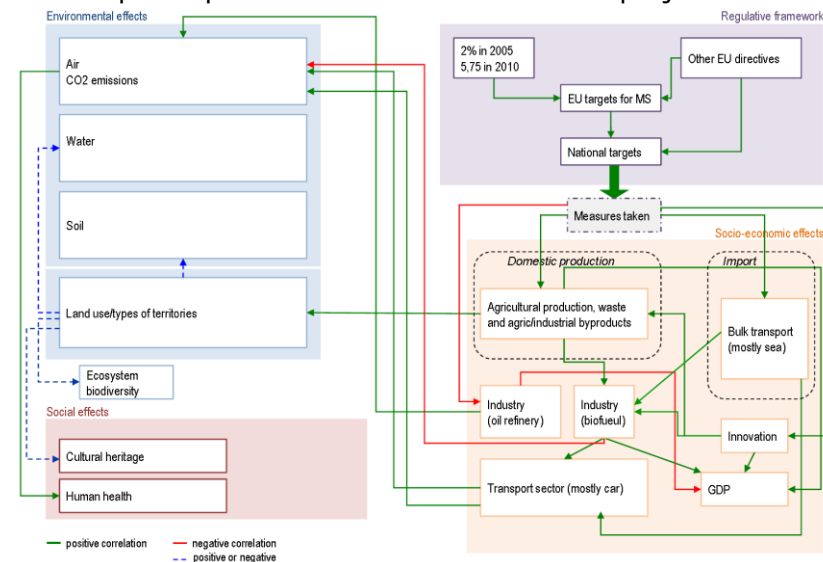
Territorial Impact Assessment

This directive sets minimum percentages for renewables in fuels. As Member States can determine how to meet the target, territorial impacts depend on the measures taken by them: Either they focus on domestic production (branch a) or on import (branch b). While import means increasing transport and processing, domestic production mainly influences land-use as it adds up a choice for farmers to switch to biofuels. Both branches imply different effects, presented in the figure below. As an indicator for branch a, harbours (both sea and inland ports) and their accessibility were selected, for branch b it was assumed that farmers more likely decide to switch to grow biofuel crops if the region is of low agricultural profitability.

Most regions of the North Sea Region are affected by this directive because it is both a coastal area (harbours) and also has areas of low agricultural profitability. Even if other regions are not directly affected by this directive, it does not mean that local circumstances cannot be favourable for biofuel production in these regions.

This map is mainly to be understood as an example of territorial impact assessments which ESPON carried out for various policies. Similar approaches can also be used to assess other policies.

This map was produced for the ESPON ARTS project.



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Regional level: NUTS 2
Source: GISCO, 2006
Origin of data: ESPON ARTS
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Regions affected by Directive on promotion of use of biofuels

- Not affected
- Affected
- No data

Types of regions affected:
rural, unprofitable farming, natural areas, forest, harbour regions.

Map 28 Regions affected by Directive on promotion of use of biofuels

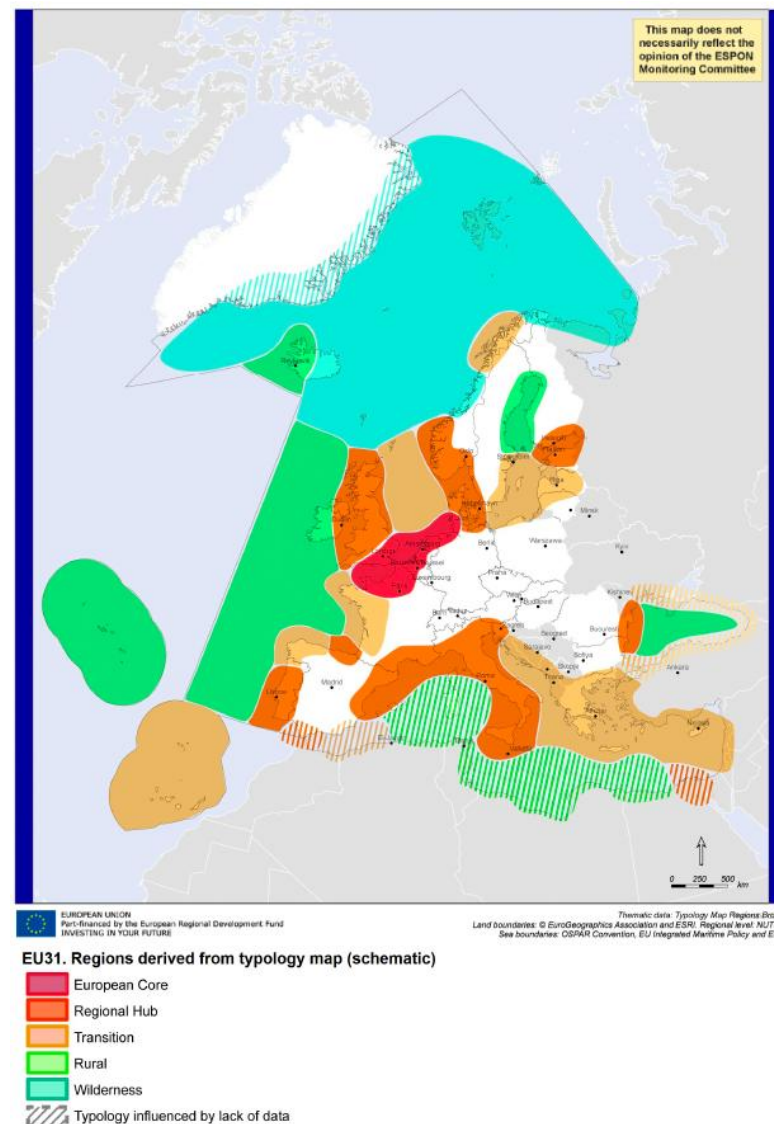
European maritime patterns

Maritime regions were classified as the Core, Regional Hub, Transition, Rural and Wilderness areas taking into account how regions are affected or not affected by maritime land-sea interaction.

The map highlights the significance of the Channel and southern North Sea as the Core maritime region of Europe. This is where overall land sea interactions are currently at their greatest. The map reflects the concentration of population and economic activity, the presence of mega ports and the bundling of communication and trade routes between Europe and the rest of the world through this strategically important area. The map also shows a number of regional hubs that relate to significant spatial concentrations of strong land-sea interactions. Some of these hubs have a transnational character and relate to more than one European sea. So for example the British hub spans both the Atlantic and the North Sea, while the hub related to Norway, Sweden, Germany and Denmark spans the North and the Baltic Sea. The eastern Mediterranean is the largest transition area but all European seas have areas where land sea interactions are still locally significant, mainly because of smaller ports and tourist destinations. Much of the remaining maritime areas are classified as rural, reflecting the increasingly low levels of human use at these islands and rather peripheral regions. Nevertheless, only the Norwegian Sea and eastern Iceland can still be characterized as Wilderness.

The North Sea Region encompasses different types of European maritime regions and is influenced by all kind of these regions. However, the programme area fully encompasses the European Core area i.e. in Belgium, the Netherlands and Germany and two Regional Hubs i.e. in the UK, Denmark, Sweden and Norway. Areas beyond these core and hubs are transition areas where maritime interactions are of local significance i.e. Norway. Northern French and southern British regions of the programme area may still be influenced by the European Core. In contrast, northern Scottish Highlands and Islands are already close to the northern Wilderness of the Norwegian Sea.

This map was produced for the ESPON ESaTDOR project.



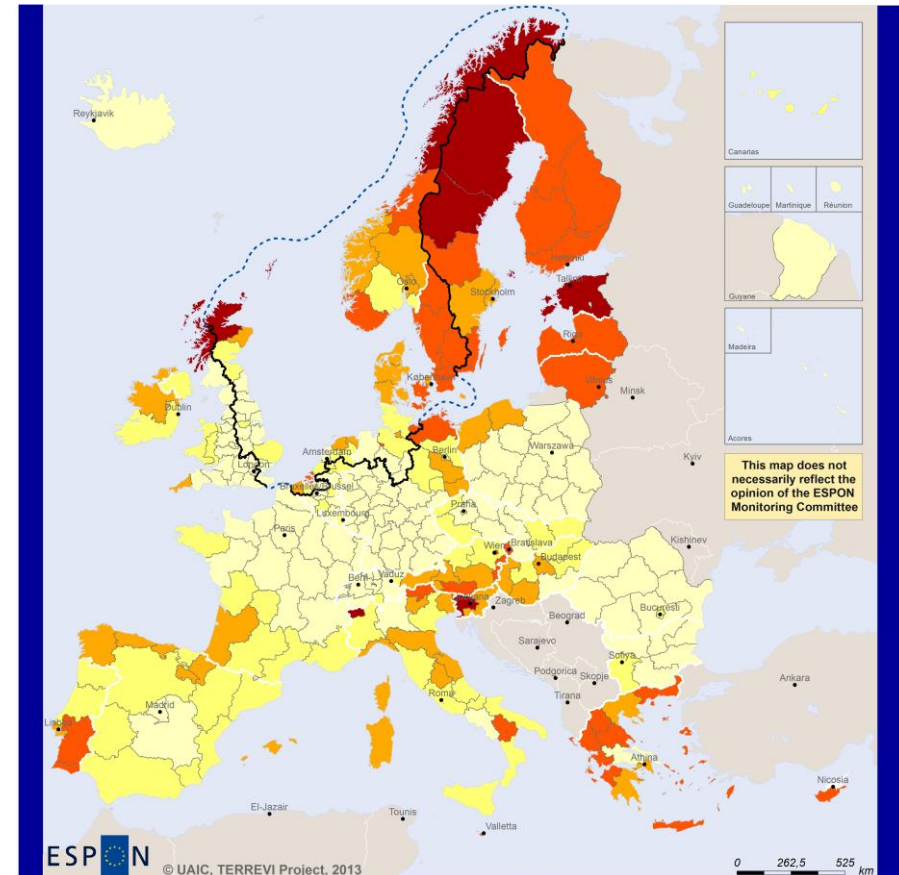
Cooperation degree

The degree of cooperation was measured by counting in each region the number of project partners involved in INTERREG B and C (III and IV) per 100,000 inhabitants for the programming period 2000-2013. In order to weight the number of project partners, the number of regional inhabitants is used as a proxy of the intensity of involvement in cooperation. As a consequence, the highest values of cooperation degree depend on both the number of projects and the number of inhabitants.

The cooperation patterns of stakeholders in territorial cooperation differ widely throughout Europe. Largely, the number of project partners in regions in the core of Europe tends to be lower in other parts. However, disparities within the countries are quite remarkable, and are usually greater than disparities between countries.

As in Europe, there are huge disparities in cooperation degree in the North Sea Region programme area. Peripheral regions stand out and this is particularly the case of Swedish, Norwegian and Scottish regions. While some regions in Germany and in the Netherlands managed to take advantage of cooperation opportunities e.g. Hamburg and Zeeland, most of the remaining Programme area regions did not i.e. most UK, Belgium, Dutch and German regions.

This map was produced for the ESPON TERCO project.

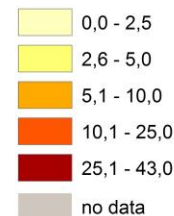


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Regional level: NUTS 2
Source: GISCO, 2006
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INTERREG project partners per 100 000 population



Map 30 Cooperation degree

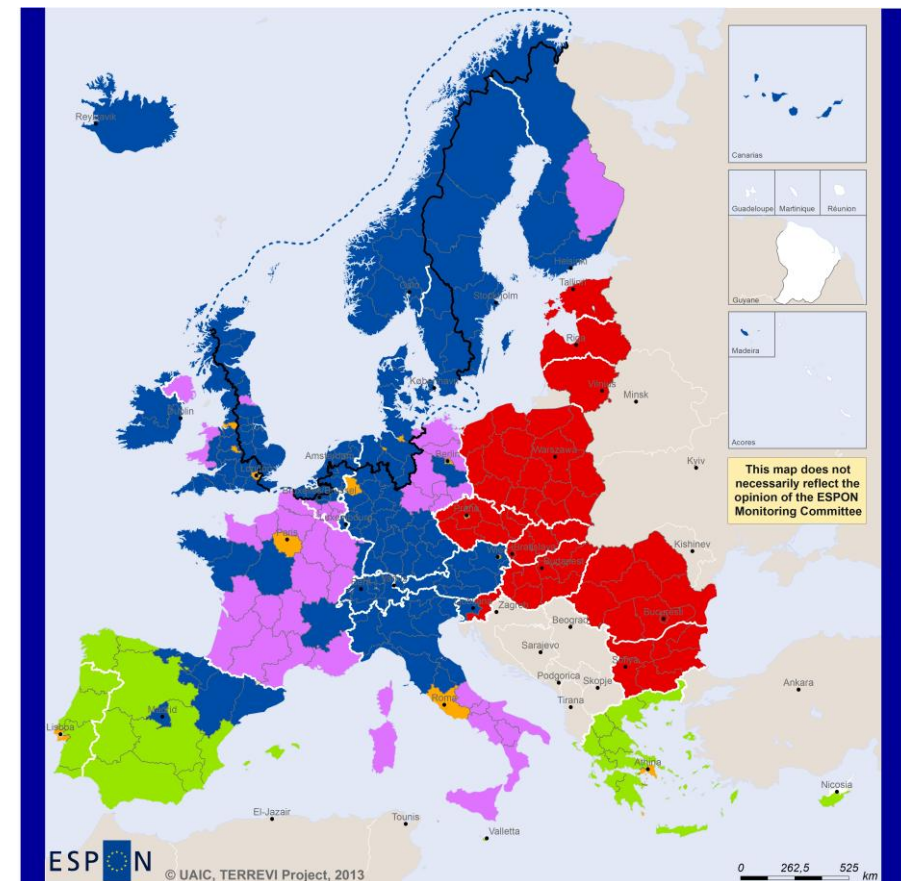
Typology of cooperation

Data used for this typology included cooperation indicators for twinning cities, INTERREG IIIB/C and IVB/C. The socio-economic determinants take into account five thematic blocks. These are: (i) transport accessibility, (ii) level of socio-economic development in terms of demographics, economic potential, economic structure and labour market; (iii) role of local governments and/or financial resources; (iv) language competences of the region's inhabitants; and (v) tourism potential. The analysis of the correlation between the indicators of cooperation and the above mentioned variables of potential determinants of territorial cooperation revealed some overarching territorial patterns.

Regions oriented on territorial cooperation twinning cities (red) can be found in Central and Eastern European regions. This type of cooperation prevails mainly in countries with low GDP. Regions with high cooperation beyond EU27+4 space (green) can be found in the southern peripheries of Europe. This type of regions prevails particularly in countries with good overseas connections and which are relatively attractive in Europe such as Malta, Cyprus, Portugal, Greece, and Spain. For those regions with relatively modest range and intensity of territorial cooperation (violet), the transnational strand of cooperation is well developed. These include regions in Eastern Germany, Southern Italy, but also the majority of the regions in France and some regions in the UK. Hubs of territorial cooperation occur mostly in city regions (yellow). This might be due to the respective administrative divisions being encapsulated within the boundaries of large urban agglomerations. Regions having a medium level and intensity of territorial cooperation (blue) can be found in the core of Europe.

A large majority of regions in the North Sea Region programme areas has a medium range and intensity of territorial cooperation. This is in line with the rest of Europe's core regions. Some cities even are qualified "Hubs of territorial cooperation" e.g. Hamburg.

This map was produced for the ESPON TERCO project.



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Regional level: NUTS 2
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Typology of territorial cooperation

- Hubs of territorial co-operation
- INTERREG oriented with high co-operation beyond the ESPON area
- Medium range and intensity of territorial co-operation
- Relatively low range and intensity of territorial co-operation
- Twinning city oriented territorial co-operation
- No data

Map 31 Typology of territorial cooperation

3 Recommended ESPON reading

ESPO provides an essential underpinning for translating into practice the calls for integrated and place-based approaches to economic development, when analysing a programme area or deciding about future programme priorities. ESPON has published a wide range of exciting reports providing valuable territorial evidence for future territorial cooperation initiatives.

The table below shows examples of relevant projects for the Cooperation Region. However, you have to study other ESPON reports as well in order to capitalise fully on the European information available for the transnational programming.

ESPON study	Topic	Content
TRANSMEC	European cooperation	It develops a method providing guidance on how ESPON results can add value to support territorial cooperation programmes (see map 27 and from map 36 to 39 on potential accessibility indicators). The method is applied for the Northwest-Europe cooperation area.
SGPTD	Growth poles	It provides evidence on European secondary cities, their performance and functional roles in different parts of Europe, and the potential policy intervention affecting their performance (see from figure 2 to 2.12). The report includes a case study on Leeds, in the UK (annex of the Scientific Report).
ATTREG	Attractiveness	It provides a better understanding of the contribution of European regions' and cities' attractiveness to economic performance and it identifies the key ingredients of attractiveness in different types of territories. The report includes a case study on the island of Bornholm, in Denmark (see Annex 4/2).
GEOSPECS	Specific types of territories	It provides evidence on the strength, weaknesses and development opportunities of specific types of territories and regions (e.g. border areas, highly or sparsely populated areas). The project focuses on the Belgian coast as a case study.
ReRisk	Energy	It focuses on opportunities to support competitive and clean energy supplies for regions in Europe and to generate and strengthen sustainable energy sources. It includes a case study of the Island of Samsø (DK).
TERCO	Territorial cooperation	It provides an assessment of the adequacy of existing territorial cooperation areas for meeting current challenges of territorial development and a proposal of potentially meaningful new cooperation areas throughout Europe. The project analyses the region of "Scotland-Sweden-Norway" as a case study (see 2.3.5 in the Scientific Report).
KIT	Innovation	It takes into account the current state, patterns and potentials of regions with respect to the knowledge and innovation economy and identifies new development opportunities through innovation for Europe and its territories (see from map 3.1.1 to 4.4.1). The case studies include ICT in Cambridge (volume 2 of the annex of the scientific report), and TV and digital media in Cardiff (volume 3 of the annex of the scientific report).
RISE	Integrated strategies	It shows how monitoring and evaluation indicators and methodologies can be used to enhance the development of Regional Integrated Strategies. The case studies include Randstad, in the Netherlands, and Zealand, in Denmark.
TPM	Territorial performance	The project analysis how territorial impacts of macro challenges translate at the regional level and how to best deal with these challenges. The project provides a regional case study on the Flanders, in Belgium (see the Annex "Vlaanderen").
EUROISLANDS	Islands	It gives evidence on the divergence of island's situation and on existing policy measures for the islands. The project includes a study on Samsø.

Furthermore, some of overall ESPON products of particular interest for territorial cooperation are:

- **ESPON Synthesis report** "new evidence on smart, sustainable and inclusive territories" provides an easy to read overview on ESPON results available.
- **ESPON Territorial Observations** is a publication series, which on a few pages presents policy relevant findings deriving from latest ESPON research.
- **ESPON 2013 Database Portal** provides regional information provided by ESPON projects and EUROSTAT.
- **ESPON HyperAltas** allows comparing and analysing a region's relative position at European, national and local scale for a wide range of criteria.
- **ESPON MapFinder** provides access to the most relevant ESPON maps resulting from ESPON projects and reports.
- **ESPON Typologies** provides nine regional typologies for additional analysis of regional data to be considered in the European context.

All ESPON reports and tools are freely available at

www.espon.eu

www.espon.eu

The ESPON 2013 Programme is part-financed by the European Regional Development Fund, the EU Member States and the Partner States Iceland, Liechtenstein, Norway and Switzerland. It shall support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory.